

# Your health

Report of the Chief Health Officer  
Victoria, 2019



Department  
of Health



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Victoria, 2019

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# Preface

As Victoria's Chief Health Officer, and on behalf of the Department of Health, I acknowledge and respect Victoria's Traditional Owners as the original custodians of Victoria's land and waters. I honour Elders past and present whose knowledge and wisdom have ensured the continuation of culture and traditional practices.

Welcome to *Your health: Report of the Chief Health Officer, Victoria, 2019*.

This is the eighth report published by the Chief Health Officer of Victoria, and the second since I commenced in this role in 2019.

This report, published as a requirement of the *Public Health and Wellbeing Act 2008*, presents information across a range of key topics that provide a snapshot of the health of Victorians in 2019.

Different to previous editions of *Your health* report that cover a two year period, this report only covers the year of 2019. One of the reasons behind why this report solely captures 2019, relates to the record-breaking temperatures of the 2018–19 summer and the devastating Eastern Victorian bushfires of the summer of 2019–20.

As a consequence of those major events, climate change became a key focus of this report.

The catastrophic bushfires – which killed five people, impacted more than 120 communities, and displaced thousands of Victorians – demonstrated the immediate and serious impacts that climate change can have on health and wellbeing.

The smoke from these fires – and from other fires across state borders – significantly impacted air quality in population centres, leading to increased hospitalisations and emergency department presentations for respiratory conditions such as asthma and chronic obstructive pulmonary disease (COPD). In Victoria, there was a 95 per cent increase in asthma-related hospitalisations and a 125 per cent increase in asthma-related emergency department presentations in the week beginning 12 January 2020. The health impacts of the 2019–20 bushfires will be felt for years to come.

In addition to devastating bushfires, climate change is also contributing to more extreme heat days, and an increase in the frequency and intensity of extreme rainfall events (and associated flooding).



With Victorian climate projections indicating that current climate trends are set to continue, significant, urgent and sustained action is needed to reduce greenhouse gas emissions and support adaptation within our communities. Victoria's *Climate Change Act 2017* provides the state with a legislative foundation to manage climate change risks and drive transition to a climate resilient community and economy. In 2019, the department continued to build on this foundation, with implementation of the department's Environmental sustainability strategy 2018–19 to 2022–23, inclusion of climate change as one of four key focus areas in the Victorian Public health and wellbeing plan for 2019–2023 and release of the Pilot health and human services climate change adaptation action plan 2019–21.

The other reason why this report focuses solely on 2019 is because the COVID-19 pandemic first started affecting us in January 2020. Almost three years on, we are still dealing with the social, economic and public health ramifications of the pandemic and still collating data on its impact on Victorians. With that in mind we've decided the next *Your health* report will focus on the COVID-19 affected years, beginning in 2020, so we can provide a comprehensive analysis of the widespread health impacts on the Victorian community.

Returning to the public health impacts of climate change, you will find many references to climate change in this report. These references reflect the urgent public health reality our state faces.

Victoria's climate is already changing and the associated impacts on the health and wellbeing of Victorians – far from being consigned to the distant future – are now a lived reality for many.

Climate change is far from being consigned to the distant future and is already a lived reality for many Victorians and is already impacting their health and wellbeing.

The point I am making is that climate change is not just an economic or environmental concern. Climate change is a public health emergency – and the emergency became immediate for thousands of Victorians in the summer of 2019–20. Public health has a central role in driving action on climate change, seeking solutions and supporting the community to adapt to its impacts.

That is why urgent and sustained action is needed to reduce greenhouse gas emissions and support adaptation within our communities.

I encourage readers of this Chief Health Officer report to explore the public health activities and measures outlined in the many linked reports and data sources that form part of this report.

Adj Clin Prof Brett Sutton  
Chief Health Officer

# Chapter 1 – Introduction

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Keeping Victorians healthy and well is important for individuals, families and the community, and crucial for a strong economy and productive workforce.

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## Purpose

The *Report of the Chief Health Officer Victoria, 2019* is the eighth *Your health* report.

*Your health* is published every two years, as required by the *Public Health and Wellbeing Act 2008 (section 21c)*. Its purpose is to provide a snapshot on the health and wellbeing of Victorians, as well as the determinants of health in Victoria. These biennial reports track public health over time at a broad population level.

## Theme

*Your health* highlights that global climate change is increasingly impacting Victoria's health.

In 2019–20, the impact of the Eastern Victorian bushfires was significant. Five lives were lost, thousands displaced, and numerous communities temporarily isolated. Direct health impacts of this event are outlined in Chapter 2, as are other effects that will increase unless urgent, sustained action is taken to reduce greenhouse gas emissions.

At a broader level, Chapters 3–5 discuss specific environmental health, water quality safety and food safety matters, while Chapter 6 provides an overview of Victoria's population profile. Wide-ranging public health indicators are used in Chapter 7 to summarise health inequalities across Victorian subgroups. Chapter 8 measures Victoria's overall burden of disease.

Chapters 9–17 focus on specific domains that contribute to and determine health status, including healthy living, maternal and infant health, child health, communicable disease, mental health, and oral health.

The report can be read sequentially or chapters can be read individually. The articles in each chapter are not an exhaustive examination of each topic. Instead, they present an overview of each topic and provide links to other reports for readers seeking more detailed information.

## Scope

Previous *Your health* reports consolidated and summarised data over a two-year period. This report focuses on the single calendar year of 2019, with some topics, such as the 2019–20 summer bushfires, overlapping into the first months of 2020.

The next *Your health* report, due in 2024, will cover the initial years of the COVID-19 pandemic, and focus on the impacts of the pandemic on the Victorian community.



## Data considerations

The data in *Your health* was obtained from a variety of sources, including Victorian and national databases and published sources. Data sources and references are cited at the end of each chapter.

The cited data is the most recent available at the time of data extraction (up to December 2019). If the required data for the reporting period was either not available, not reliable, or not collected, the most recent and reliable information available was used. When the data provided falls outside the reporting period (1 January 2019 until 31 December 2019) it is noted.

Most of the information provided is specific to the Victorian resident population. However, some sections include information relevant to other jurisdictions and/or all of Australia. When information from other jurisdictions is used it is noted.

Common information and data sources referred to in *Your health* include:

- The Australian Bureau of Statistics (ABS) – Australia’s national statistical agency providing official statistics on a wide range of economic, social, population, and environmental matters.
- The Australian Institute of Health & Welfare (AIHW) – an independent statutory Australian Government agency that provides meaningful information, reports statistics that draw on national major health, and welfare datasets.

- Publicly-released Department of Health reports on Victorian hospitals and health services, primary and community health, mental health, alcohol and drug services, ageing and aged care, and health prevention and promotion.
- Publications and evidence from agencies, organisations, institutions and consultative councils (such as the Cancer Council Victoria and the Environment Protection Authority Victoria).
- The Victorian Admitted Episodes Dataset (VAED) – a state-wide dataset that collects hospital admissions data from all Victorian hospitals (public and private).
- The Victorian Population Health Survey 2019 – an annual survey that collects information on the health and wellbeing of Victorian adults.

On 1 February 2021, the Department of Health and Human Services (DHHS) separated into two new departments: the Department of Health (DH) and the Department of Families, Fairness and Housing (DFFH). DH is now responsible for preparing and publishing *Your health*. Throughout the report, there are references to publications and data produced under the previous department’s name, DHHS.



# Chapter 2 – Climate change and its impacts on health

Climate change poses an immediate and serious threat to public health in Victoria. The size and scope of that threat was demonstrated by the Eastern Victorian bushfires of 2019–20.

Victoria's climate is already changing and impacting the health and wellbeing of many Victorians. With current climate trends projected to continue, there is an urgent need to act to protect the health, safety, and wellbeing of Victorians (Department of Health and Human Services 2019).

That is why the department is committed to tackling climate change and its impacts on health.

## Victoria's climate is changing

Increasing concentrations of greenhouse gases in the Earth's atmosphere are warming the planet at an unprecedented rate. This warming can only be explained by human activity (Intergovernmental Panel on Climate Change, as cited in Department of Environment, Land, Water and Planning, 2019).

*Victoria's Climate Science Report 2019* presents striking evidence that Victoria's climate has changed in recent decades – becoming warmer and drier.

- In 2019, the average temperature across Victoria had warmed by just over 1.0°C since official Bureau of Meteorology records began in 1910 (DELWP, 2019).

## Victoria's climate has changed



Temperature **increase** of 1.2°C since 1910



**Decrease** in average rainfall



Significant **increase** in fire danger in spring

Updated from Victoria's Climate Science Report 2019.

'Anyone under the age of 23 who has always lived in Victoria has never experienced a year of below-average temperature' (DELWP, 2019).

- Victoria has experienced an overall increase in the frequency of unusually hot days.
- Over the past 30 years, Victoria's cool season rainfall has declined compared to last century.
- The mean sea level for Melbourne has risen by approximately 2 mm per year since 1966.
- There has been an increase in dangerous fire weather and an increase in the length of the fire season across southern Australia since the 1950s (DELWP, 2019).

'A dramatic increase in the number, size, and severity of bushfires in Victoria over the past two decades has underscored a growing realisation by scientists, agencies, and communities that climate change has already altered bushfire risk for the worse. There are clear links between climate, drought, increased fire activity, longer and earlier seasons, and more intense fire behaviour in Victoria' (DELWP, 2019).

The Bureau of Meteorology reported that 2019 was Victoria's fifth warmest year and tenth driest year on record (2020). There were also several days of elevated fire danger during spring, including some extreme Forest Fire Danger Index (FFDI) values (Bureau of Meteorology 2019b).

It is estimated that climate change accounted for at least a 30 per cent increase in the risk of fire weather associated with the 2019–20 Eastern Victorian bushfires, largely driven by an increase in temperature extremes (van Oldenborgh et al, 2021). The true magnitude of this increased risk was likely to be much higher due to limitations in the climate models used (van Oldenborgh et al, 2021).

## Climate change is affecting health

Climate change affects health in myriad ways. It affects health directly due to more intense and frequent extreme events, including heatwaves, floods, drought and bushfires. And it affects health indirectly due to worsening air quality, changes in the spread of infectious diseases, risks to food safety and security, water quality, and effects on mental health (Watts et al, 2015).

Social determinants of health influence a population's vulnerability or resilience to climate-related hazards. Climate change also impacts social determinants of health, such as food security, housing, and socioeconomic

status. The direct and indirect impacts of climate change and the social determinants of health will be felt earlier, and be most pronounced, in the following priority communities:

- children and young people
- pregnant women
- people over 65, including those living alone
- people experiencing homelessness or insecure housing
- people experiencing financial hardship
- Aboriginal and Torres Strait Islander peoples
- people with disability
- Culturally and Linguistically Diverse (CALD) communities and new migrants
- people with one or more chronic conditions
- LGBTIQ+ communities.

(Department of Health and Department of Families, Fairness and Housing, 2022).

In addition, the ability of infrastructure, such as hospitals, to deliver health services is increasingly affected by climate change through more frequent and extreme weather events and sea level rise (Victorian Health and Human Services Building Authority, 2018).

The remainder of this section focuses on two extreme events that impacted the health and wellbeing of Victorians in 2019 – the 2018–19 summer heatwaves and the 2019–20 Eastern Victorian bushfires.

### Summer heatwaves

During the 2018–19 summer, much of Australia was gripped by record-breaking heatwaves (Bureau of Meteorology, 2019). The 2018–19 summer was Victoria's hottest on record, as well as Australia's hottest summer on record by a margin of 0.86°C. In addition, January 2019 was Victoria's hottest month on record, as well as Australia's hottest month on record by a margin of 0.99°C. On 25 January, Kerang reached a maximum of 47.6°C – a new Victorian record for January. The Bureau of Meteorology attributed the extreme heat to a combination of anthropomorphic climate change and natural variability.

## January 2019 was Victoria's hottest month ever recorded



Extreme heat can cause illnesses, such as heat cramps and heat exhaustion, and lead to a life-threatening condition, heatstroke (DHHS, 2018). Heat can also exacerbate pre-existing medical conditions, such as heart disease or diabetes, and increase the risk of disease associated with climate-sensitive pathogens (DHHS, 2018).

There was an association between warmer temperatures and an increase in sporadic (non-outbreak) notifications of salmonellosis in Melbourne for the period of 2000–19. Maximum effects on notifications were shown four weeks after warm temperature periods (Robinson et al, 2022).

See the 'Heat health' section of 'Chapter 3 – Environmental health', for more information about extreme heat.

### Eastern Victorian bushfires

The Eastern Victorian bushfires began on 21 November 2019 and were not largely contained until February 2020 (Bushfire Recovery Victoria, 2021).

The impacts of the bushfires were broad and devastating. Five lives were lost, more than 120 communities impacted, 313 homes destroyed or damaged, and thousands of people displaced (including almost 2,000 people evacuated from the Mallacoota foreshore by air or sea). In addition, 1.5 million hectares of country were burnt (including more than 1,000 registered Aboriginal cultural heritage places) and habitat

## Devastating impacts of bushfires included:



**5** lives lost



**313** homes destroyed or damaged



Over **120** communities effected



Over **1,000** registered Aboriginal cultural heritage places burnt



**1.5 million** hectares of country burnt



**Thousands** of people displaced

and biodiversity severely impacted. There were also significant impacts on regional industries and infrastructure (Bushfire Recovery Victoria, 2021). While each of these impacts had potential implications for health and wellbeing, the most widely reported health impacts were associated with air pollution caused by bushfire smoke. See the 'Air quality' section of 'Chapter 3 – Environmental health', for more information about air quality.

Analyses of health data identified significant increases in hospitalisation and emergency department presentation rates in Victoria during periods of significant fire activity or air pollution. That health data included:

#### **Hospitalisations** (relative to the previous five-year period)

- a 95% increase for asthma (in the week beginning 12 January 2020)
- a 53% increase for breathing difficulties (in the week beginning 19 January 2020)
- a 50% increase for chronic obstructive pulmonary disease (COPD) with acute exacerbation
- a 14% increase for respiratory conditions
- an 11% increase for selected heart conditions
- a 20% increase for acute myocardial infarction (heart attack) (all in the week beginning 5 January 2020).

#### **Emergency department presentations** (relative to the previous bushfire season)

- a 125% increase in emergency department presentations with a principal diagnosis of asthma in the week beginning 12 January 2020 (note that ACT and NSW had increases of 230% and 54%, retrospectively)
- a 60% increase in breathing difficulties in the week beginning 12 January 2020.

#### **Excess deaths**

- 120 excess deaths (any cause).

There were also substantial increases in prescription rates for inhalers dispensed through the Pharmaceutical Benefits Scheme (PBS) in Hume and the Greater Melbourne areas in January 2020, compared to the same period in 2019.

Sources: Australian Institute of Health and Welfare, 2021, and Borchers Arriagada et al, 2020.

The full health and related impacts of the 2019–20 bushfires, including the long-term effects on mental health and the effects of long-term exposure to bushfire smoke, will not be known for some time (AIHW 2020).

#### **Chief Health Officer advisory: Health concerns related to Victorian bushfires**

On 24 January 2020, a Chief Health Officer health advisory was issued to health professionals (updating a 3 January 2020 advisory) in response to the 2019-20 bushfires. The advisory highlighted the broad range of potential health risks faced by Victorian communities during this event. It included advice around:

- monitoring the current fire risk
- the impacts of bushfire smoke on health – including advice in heavily smoke-affected areas to stay indoors and reduce activity, keep indoor air as clean as possible, face-mask use, and, in the case of sensitive groups, to consider temporarily relocating
- the risk of contamination of private drinking water in fire-affected areas
- the risk of gastrointestinal illness from contaminated food due to power outages and the importance of key protective behaviours (such as hygiene and food safety)
- protection from mosquito bites and associated risk of Ross River virus and Barmah Forest virus following rainfall in previously dry mosquito-breeding areas
- the risk of zoonotic diseases from contact with injured or dead wildlife
- mental health impacts, self-care, and supports.

## Victoria's future climate

According to climate projections, by the 2050s a high-emissions scenario would see:

- Victoria's average annual temperature increase up to 2.4°C compared to the 1986–2005 average, and the number of very hot days likely double.
- Annual rainfall decrease across the state, especially in the cool season. However, due to natural variability, extreme rainfall events would still occur and be likely to be more intense, potentially increasing the risk of flash flooding.
- The number of high fire-danger days in Victoria increase by up to 60 per cent.
- Sea levels continue to rise. By the 2050s, sea levels are projected rise by around 24 cm (relative to 1986–2005) under both medium- and high-emissions scenarios (DELWP, 2019).

Climate change is already affecting the health of Victorians. If changes to Victoria's climate follow the trajectory outlined in the DELWP projections, future impacts on the health and wellbeing of Victorians will be even greater.

Although climate change is a fundamental threat to health, many of the actions to reduce greenhouse gas emissions can bring health benefits.

For example, increased use of active transport (such as walking and cycling) reduces greenhouse gas emissions, while helping reduce rates of obesity, diabetes, heart disease, some cancers, and musculoskeletal conditions (DHHS, 2015). Eating a diet with less animal-based and processed foods and more plant-based foods, such as fruits, vegetables, nuts, seeds and whole grains, also has improved health and environmental benefits (Dietz, 2020).

That is why the department is committed to taking action on climate change and helping Victorians stay healthy in a changing climate. Key examples of actions taken in 2019 are outlined below.

If global emissions continue to increase, in the 2050s Victoria may experience...

Average annual temperature **increase** of up to 2.4°C



**Longer** fire seasons, with up to double the number of high fire danger days

**Double** the number of very hot days



**Decline** in alpine snowfall of 35–75%

Sea levels **rising** by around 24 cm



**Decline** in cool season rainfall



More **intense** downpours



Updated from Victoria's Climate Science Report 2019.

## How Victoria is responding

### Climate Change Act 2017

Victoria's *Climate Change Act 2017* provides a legislative foundation to manage climate change risks and drive transition to a climate resilient community and economy.

The Act includes requirements for the Victorian Government to:

- contribute to whole-of-government emissions reduction to meet net zero emissions by 2050
- prepare whole-of-government and sector emission reduction pledges
- ensure that any decision, policy, program, or process that is made, developed, or implemented by the Victorian Government takes account of climate change
- develop and implement adaptation action plans, including risks and impacts on systems.

Under the Climate Change Act, state and local governments also must have regard to climate change when undertaking public health and wellbeing planning.

### Victorian public health and wellbeing plan

In August 2019, DHHS published the *Victorian public health and wellbeing plan 2019–2023*.

The plan sets out a comprehensive approach to delivering improved public health and wellbeing outcomes for all Victorians.

The plan recognises that climate change is a leading threat to the health and wellbeing of Victorians. 'Tackling climate change and its impact on health' is one of the plan's four key focus areas – alongside increasing healthy eating, increasing active living, and reducing tobacco-related harm. Associated strategic actions aim to: achieve resilient and safe communities that are adapting to the public health impacts of climate change; decrease health impacts associated with climate change (such as fewer deaths from extreme heat events,

fewer mosquito-borne diseases, fewer food outbreaks, and fewer algal blooms in drinking water catchments); and reduce greenhouse gas emissions and realise health co-benefits (DHHS, 2019).

Under the *Public Health and Wellbeing Act 2008*, local government areas are required to prepare a four-year municipal public health and wellbeing plan (MPHWP) that has regard to the state public health and wellbeing plan.

### Pilot health and human services climate change adaptation action plan

In 2019, the DHHS published the *Pilot health and human services climate change adaptation action plan 2019–21*. The plan outlined risks to public health and the health and human services and identified actions to address those risks (DHHS, 2019).

Alongside the pilot plan, the department and funded agencies (including public hospitals and health services) are undertaking a wide range of emission reduction initiatives across the health system.

### Environmental sustainability strategy 2018–19 to 2022–23

The department's *Environmental sustainability strategy 2018–19 to 2022–23* sets out its commitment to improve the environmental sustainability of the health system (DHHS, 2016).

The strategy also includes actions to make the health system resilient in the face of climate change (Victorian Health and Human Services Building Authority, 2018).

In 2019, the environmental sustainability innovation grant program also funded a number of projects across health services in Victoria.



## Find out more

Further information on actions the department is taking to tackle climate change is available from the department's *Climate change and health* webpage <<https://www.betterhealth.vic.gov.au/health/healthyliving/climate-change-and-health>>.

*Climate change and health*, which is on the Better Health Channel, includes information and animated videos to help Victorian communities stay healthy in a changing climate. The webpage also highlights actions individual Victorians can take to reduce their environmental footprint while also improving their health.

## References

Australian Institute of Health and Welfare 2020, 'Australian bushfires 2019–20: exploring the short-term health impacts', AIHW, Australian Government, Canberra (last updated 12 November 2021).

Australian Institute of Health and Welfare 2021, 'Data update: Short-term health impacts of the 2019–20 Australian bushfires', AIHW, Australian Government, Canberra (last updated 28 November 2021).

Borchers Arriagada et al, 2020, 'Unprecedented smoke-related health burden associated with the 2019–20 bushfires in eastern Australia', *Medical Journal of Australia*, 213: 282–283 <<https://doi.org/10.5694/mja2.50545>>.

Bureau of Meteorology 2019, 'Special Climate Statement 68 – widespread heatwaves during December 2018 and January 2019', Australian Government, Canberra (last updated 14 March 2019).

Bureau of Meteorology 2019b, 'Special Climate Statement 72 – dangerous bushfire weather in spring 2019', Australian Government, Canberra (last updated 18 December 2019).

Bureau of Meteorology, 2020, 'Annual Climate Summary for Victoria – 2019', <<http://www.bom.gov.au/climate/current/annual/vic/archive/2019.summary.shtml>> (viewed on 16 September 2022).

Bushfire Recovery Victoria 2021, '2019–20 Eastern Victorian bushfires', <<https://www.vic.gov.au/2019-20-eastern-victorian-bushfires>> (viewed on 19 Sept 2022).

Department of Environment, Land, Water and Planning 2019, 'Victoria's climate science report 2019', State Government of Victoria, Melbourne.

Department of Health and Department of Families, Fairness and Housing 2022, 'Health and human services climate change adaptation action plan 2022–26', State Government of Victoria, Melbourne.

Department of Health and Human Services 2018, 'Survive the heat', <[betterhealth.vic.gov.au/heat](http://betterhealth.vic.gov.au/heat)> (viewed on 20 September 2022).

Department of Health and Human Services, 2019. 'Pilot health and human services climate change adaptation action plan 2019–21'. State Government of Victoria, Melbourne.

Department of Health and Human Services, 2019b. 'Victorian public health and wellbeing plan 2019–2023'. State Government of Victoria, Melbourne.

Department of Health and Human Services 2020, 'Chief Health Officer Advisory: Health concerns related to Victorian bushfires', 24 January 2020 (update to Advisory issued 3 January 2020), State Government of Victoria, Melbourne.

Dietz WD 2020, 'Climate change and malnutrition: we need to act now', *Journal of Clinical Investigation*, vol.130, no. 2, pp. 556–558.

Malik A, Li M, Lenzen M, Fry J, Liyanapathirana N, Beyer K, Boylan S, Lee A, Raubenheimer D, Geschke A & Prokopenko M (2022) 'Impacts of climate change and extreme weather on food supply chains cascade across sectors and regions in Australia', *Nature Food*, vol. 3, pp. 631–643.

Mora C, McKenzie T, Gaw IM, Dean JM, von Hammerstein H, Tabatha A, Knudson TA, Setter RO, Smith CZ, Webster KM, Patz JA and Franklin EC 2022, 'Over half of known human pathogenic diseases can be aggravated by climate change', *Nature Climate Change*, vol. 12, Sept 2022, pp. 869–875.

Parkinson D 2019, 'Investigating the Increase in Domestic Violence Post Disaster: An Australian Case Study', *Journal of Interpersonal Violence*, vol. 34, no. 11, pp. 2333–2362.

Sutton B, Mulvenna V, Voronoff D and Humphrys T 2020, 'Acting on climate change and health in Victoria' *Medical Journal of Australia*, vol. 212, no. 8, pp. 345–346.

University of Sydney 2022, 'Climate threat to food supply chains creates 'domino effect', <<https://www.sydney.edu.au/news-opinion/news/2022/08/19/climate-threat-to-food-supply-chains-creates--domino-effect-.html>>.

van Oldenborgh GJ, Krikken F, Lewis S, Leach NJ, Lehner F, Saunders KR, van Weele M, Haustein K, Li S, Wallom D, and Sparrow S, Arrighi J, Singh RK, van Aalst MK, Philip SY, Vautard R, and Otto FEL 2021, 'Attribution of the Australian bushfire risk to anthropogenic climate change', *Natural Hazards and Earth System Sciences*, vol. 21, pp. 241–960.

Victorian Health and Human Services Building Authority 2018, 'Environmental sustainability strategy 2018–19 to 2022–23', State Government of Victoria, Melbourne.

Watts N, Adger W, Agnolucci P, Blackstock J, Byass P, Cai W and Costello A 2015, 'Health and climate change: policy responses to protect public health', *The Lancet*, vol. 386, no. 7.

Zhang Y, Beggs PJ, McGushin A, Bambrick H, Trueck S, Hanigan IC, Morgan GG, Berry HL, Linnenluecke MK, Johnston FH, Capon AG, Watts N, 2020, 'The 2020 special report of the MJA-Lancet Countdown on health and climate change: lessons learnt from Australia's "Black Summer"', *The Medical journal of Australia*, vol. 213, no. 11, pp. 290–492.



# Chapter 3 – Environmental health

Environmental health is all about reducing exposures to environmental factors that cause disease and create environments that are good for human health.

Human health is determined by physical, chemical, biological, and social factors. The purpose of environmental health is to achieve best possible outcomes for public health by assessing and managing those physical, chemical, biological, and social factors.

With that in mind, this section of *Your health* focuses on ambient (outdoor) air quality, indoor air quality, and heat health. It also discusses the significant thunderstorm asthma event of late 2016.

## Air quality

Generally, Victoria's air quality is good, but there are times when air pollution occurs at concentrations that affect the environment and human health.

**Over the coming decades worsening heatwaves and harsher bushfire seasons will increase air pollution. Drier conditions will increase dust events,** further reducing air quality.



## Effects of air pollution on health

Air pollution can cause symptoms immediately upon exposure. Those symptoms include coughing, watering eyes, difficulty breathing, and angina.

Long-term exposure can, over time, affect health or worsen medical conditions (EPA Victoria, 2018). Air pollution can cause allergies and asthma, lung and respiratory diseases, heart disease and some types of cancer. The Australian Institute of Health and Welfare estimated that in 2015 around 2,566 deaths were attributable to air pollution (AIHW 2020).

## Causes of poor air quality

Air quality can be impacted by a range of natural and human sources of air pollution.

Primary air pollutants – in the form of particles and gas – are directly emitted through mechanical or combustion processes. Inhalable particulate air pollutants are measured in micrometres, according to the size of the particles.

Examples of particulate air pollutants include:

- PM<sub>10</sub> (particles of 10 micrometres or smaller) in wind-blown dust from storms, unpaved roads, earth works and mineral mining.
- PM<sub>2.5</sub> (particles 2.5 micrometres or smaller) in smoke from bushfires, and from burning wood, coal or diesel fuel.

Secondary air pollutants are formed from chemical reactions in the atmosphere. For example, ozone gas is formed in sunlight from the reaction of volatile organic compounds with nitrous oxides.

## Air monitoring in Victoria

Victoria's air quality was generally good in 2019. However, there were periods of worsened air quality, due mostly to smoke and urban pollution (EPA Victoria, 2020).

Some periods of poor air quality were due to elevated levels of ozone gas, PM<sub>10</sub> and PM<sub>2.5</sub>. Overall, though, pollutant levels for carbon monoxide, nitrogen dioxide, and sulphur dioxide were below the national ambient air quality standards in 2019 (National Environment Protection measures, 2019).

Two major bushfires in eastern Victoria in 2019 were the main sources of high levels of PM<sub>2.5</sub> and ozone gases. During 2019, air monitoring stations also recorded increased numbers of days when PM<sub>10</sub> levels exceeded air quality standards. Some of these PM<sub>10</sub> exceedances were caused by bushfires, but the majority were from windblown dust most likely related to lower-than-average rainfall.

Highlights from *Air pollution in Victoria – a summary of the state of knowledge* (EPA Victoria, 2018) as well as the *Air monitoring report 2019* (EPA Victoria, 2020) include:

## PM<sub>10</sub> particles

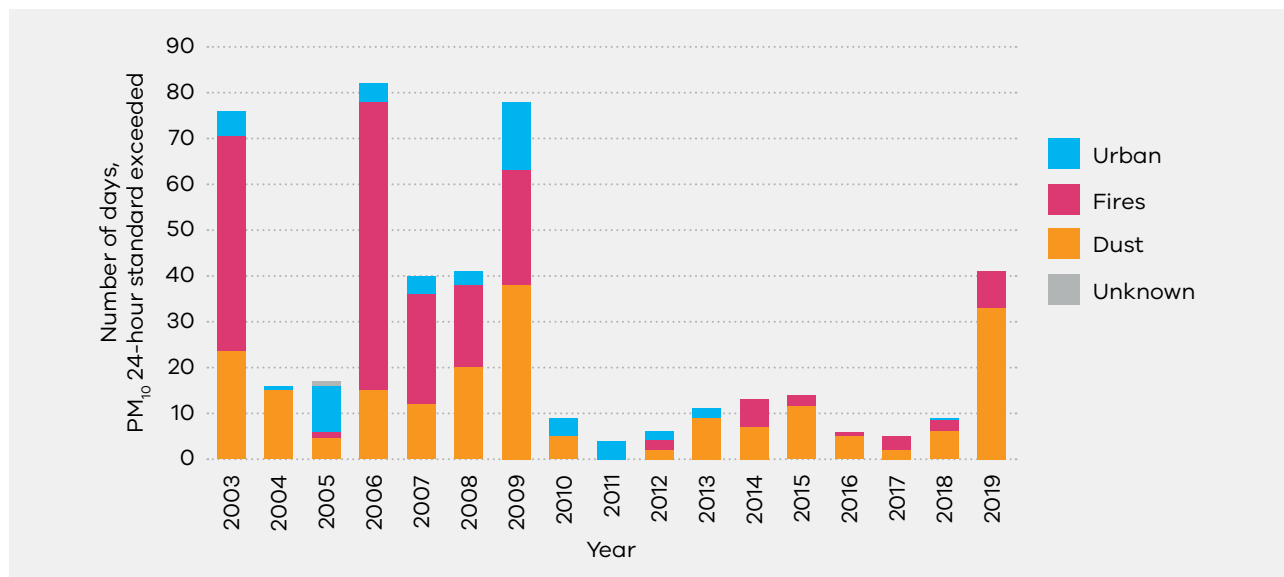
The medium-term trends for air quality with regard to PM<sub>10</sub> are improving. However, there is a long-term danger of worsening air quality as a result of more frequent and extensive dry conditions and bushfires, as illustrated by the data for 2019 in Figure 1.

- The higher levels of PM<sub>10</sub> (coarse) particles recorded in Melbourne between 2003–2009 were heavily impacted by major bushfires, planned burns, and the Millennium drought. Since then, the number of PM<sub>10</sub> exceedance days has decreased, excluding Brooklyn (which is influenced by localised sources of dust).
- In 2019, there was an increase in the number of exceedances at many air monitoring stations. The PM<sub>10</sub> particle 24-hour standard was exceeded for 41 days – with 33 of those days attributed to wind-blown dust and eight caused by fires. Bureau of Meteorology data indicates that rainfall in 2019 was approximately 28 per cent below the long-term mean.

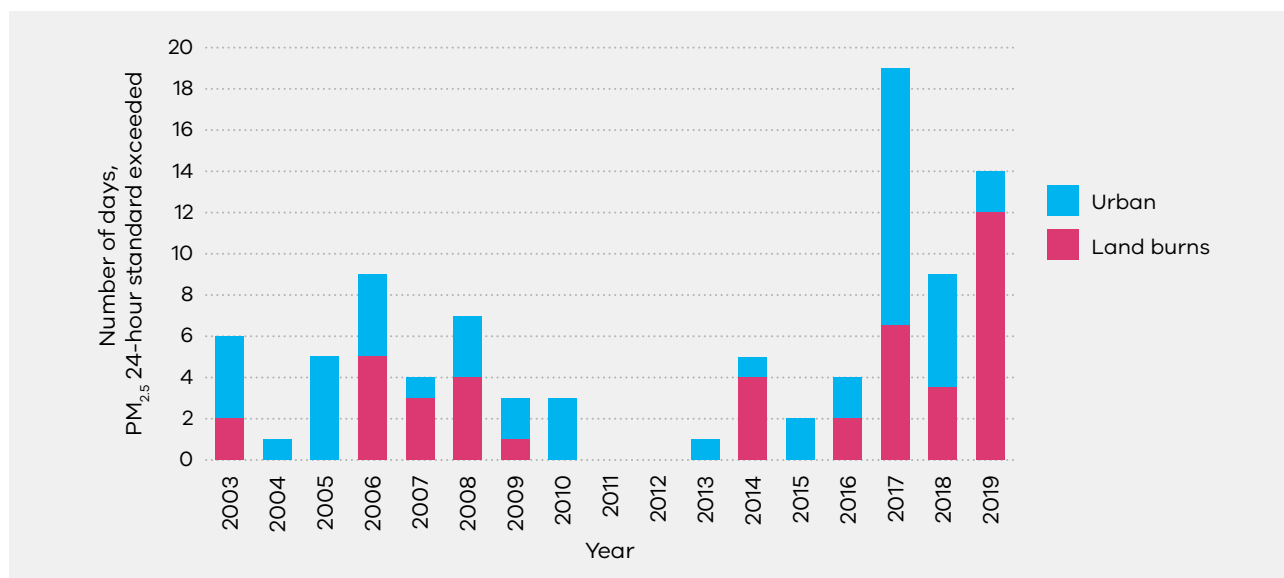
## PM<sub>2.5</sub> fine particles

- Since 2014, the number of days in Melbourne that exceeded the PM<sub>2.5</sub> fine particle 24-hour standard has increased, compared to earlier years. This increase is partly due to changes in monitoring technology, with data available every day instead of once every three days.
- In 2019, the PM<sub>2.5</sub> fine particle 24-hour standard was exceeded for 14 days – with 12 of those days attributable to land burns and nine due to urban sources (Figure 2).

**Figure 1. Number of exceedance days for PM<sup>10</sup> standard – average for Port Phillip region**



**Figure 2. Number of exceedance days for PM<sub>2.5</sub> standard – average for Port Phillip region**



### Ozone (ground level)

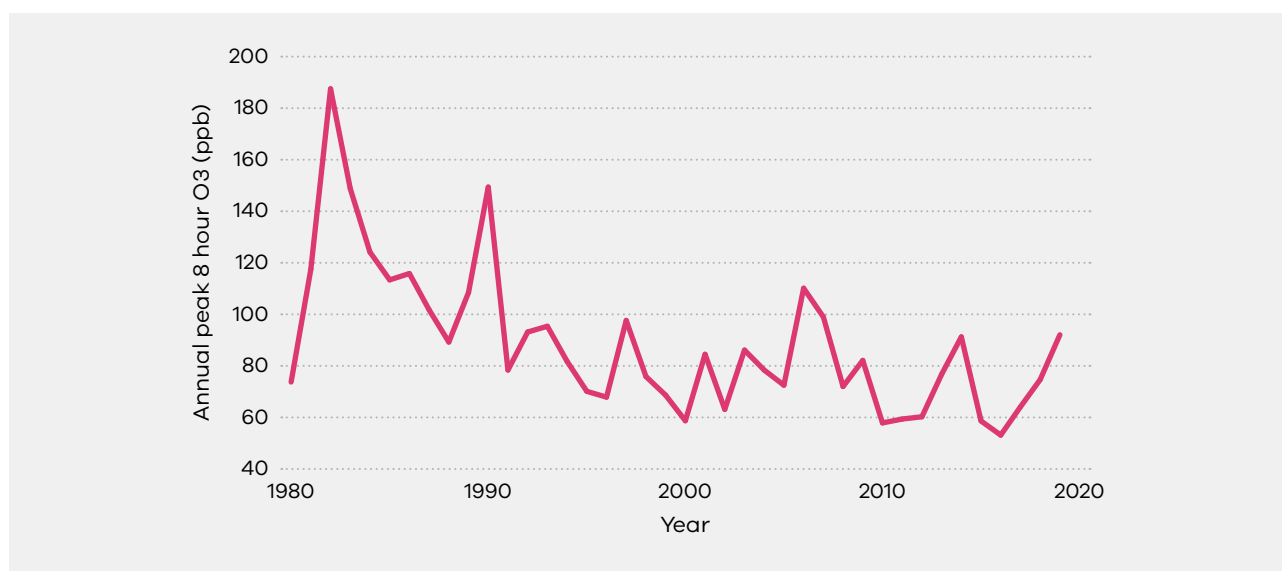
- High ozone concentrations are most likely to occur on days over 30°C with light winds, when precursor pollutants react in the atmosphere.
- Long-term trends (1979 to 2019) show the peak one-hour ozone concentration at a Melbourne station for each year has decreased (Figure 3).
- In 2019, there was a slight upward trend due to exceedances of the one-hour and four-hour

standard recorded at Alphington, Dandenong, and Mooroolbark on 20 December 2019.

These exceedances were attributed to major bushfires across the state.

- The annual average concentration of ozone is increasing (Figure 4).
- Predictions for hotter, drier conditions increase the risk of higher ozone concentrations in the future.

**Figure 3. Peak maximum one-hour ozone concentrations for Port Phillip region**



**Figure 4. Long-term trend: annual average ozone concentrations for Port Phillip region**





## 2019–2020 bushfires

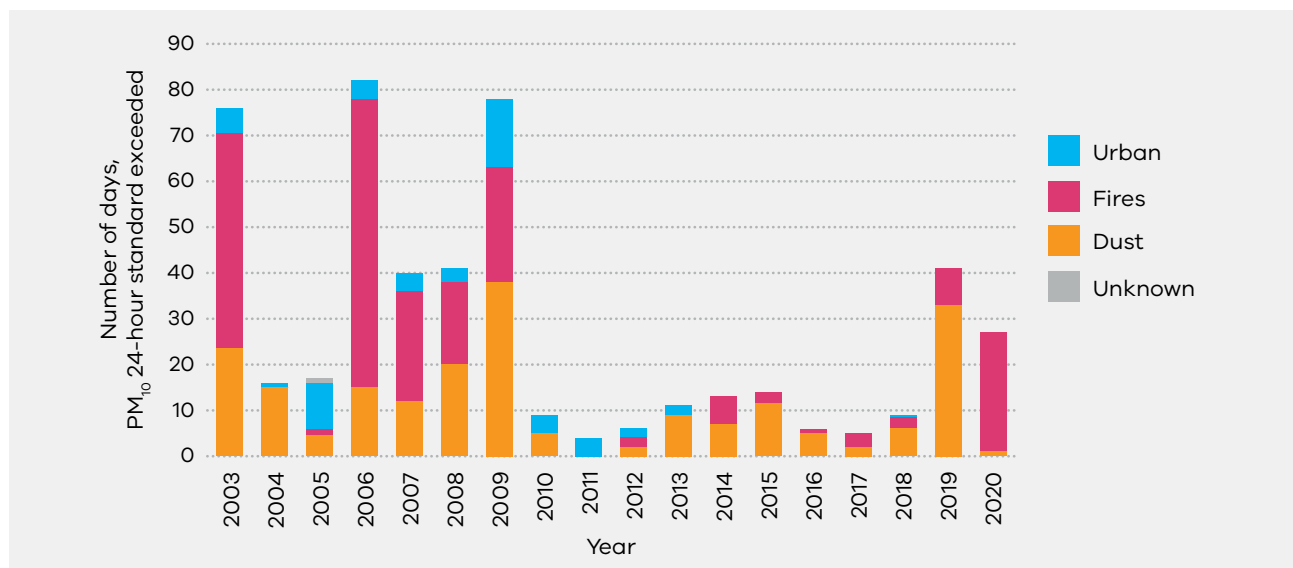
Unprecedented bushfires burned across south-eastern Australia over the 2019–20 summer. Five people in Victoria lost their lives and about one-fifth of Australia’s temperate broadleaf and mixed forests biome burned.

Smoke from these bushfires caused significant air pollution.

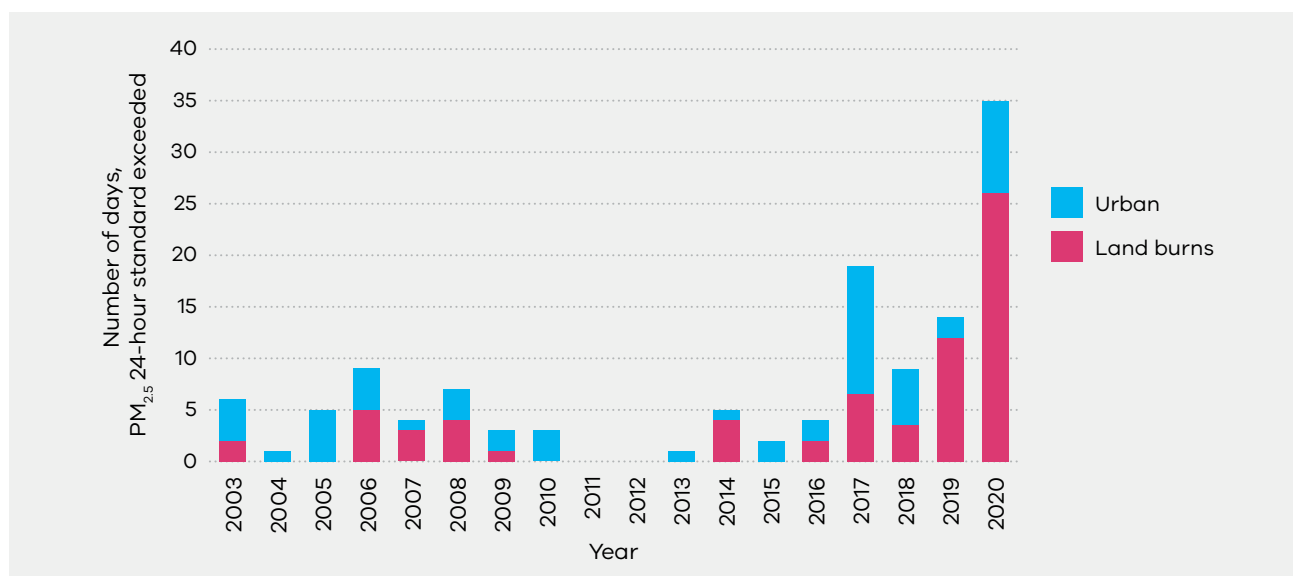
Figures 5 and 6 depict the number of days the PM<sub>10</sub> and PM<sub>2.5</sub> standards were exceeded annually since 2003. In 2019–2020, those days were mostly due to summer bushfires.

Poor air quality caused by smoke from bushfires was associated with an increase in hospitalisations and emergency department presentations for respiratory illness in Victoria (AIHW, 2021).

**Figure 5. Number of exceedance days for the PM<sub>10</sub> standard – average for Port Phillip region**



**Figure 6. Number of exceedance days for PM<sub>2.5</sub> standard – average for Port Phillip region**



## Future outlook for air quality in Victoria

Victoria's air quality is good by international standards and has improved significantly over recent decades. However, Victoria's air quality could worsen in the future.

While this report is focused on 2019, a new Air Quality Strategy for Victoria, *Clean air for all Victorians* <<https://www.environment.vic.gov.au/sustainability/clean-air-for-all-victorians>>, was released by the Victorian Government in 2022. The 2022 strategy focuses on the main causes of air pollution in Victoria, helping vulnerable Victorians and supporting the broader community, raising the bar on air quality information, and ensuring a clean air future.

Projected large population growth in Melbourne and regional centres will see associated increases in registered vehicles, infrastructure, and industries. Transport, infrastructure, and industry all affect sources of air pollution and the population's exposure to air pollution (EPA Victoria, 2018).

In addition to overall population size, the groups sensitive to air pollution are also projected to increase. Those groups include people aged over 65 years, people with heart or lung conditions, and children under 14 years of age (EPA Victoria, 2018).

Climate change is also predicted to affect future air quality by altering the meteorological variables that influence the development, chemical transformation, dispersion and deposition of air pollutants (EPA Victoria, 2018).

According to projections, Victoria is likely to become hotter and drier in the future. In coming decades, Victorians are likely to experience:

- worsening heatwaves and more frequent single days of extreme heat
- declining rainfall during autumn, winter and spring
- increased bushfire activity, longer and earlier seasons, and more intense fire behaviour (DELWP, 2019).

These shifts are all related to the changing climate, and will impact the type and scale of exposure to air pollution (EPA Victoria, 2018).

Extended dry conditions may also cause large-scale dust events, further reducing air quality (EPA Victoria, 2018).

## Find out more

The [Environment Protection Authority's air quality in Victoria webpage](https://www.epa.vic.gov.au/) <<https://www.epa.vic.gov.au/>>.

## Healthy indoor environments

'Home' means refuge and security: a place to which we turn to replenish our energies (Ryd 1991).

That is why good-quality housing, including good-quality indoor environments, is important for public health.

### Housing a growing population

By 2056, Victoria's population is projected to double to 11.2 million people.

This increase in population is estimated to be due to natural population increase of 1.6 million people and net migration of 3.2 million people (DELWP, 2019).

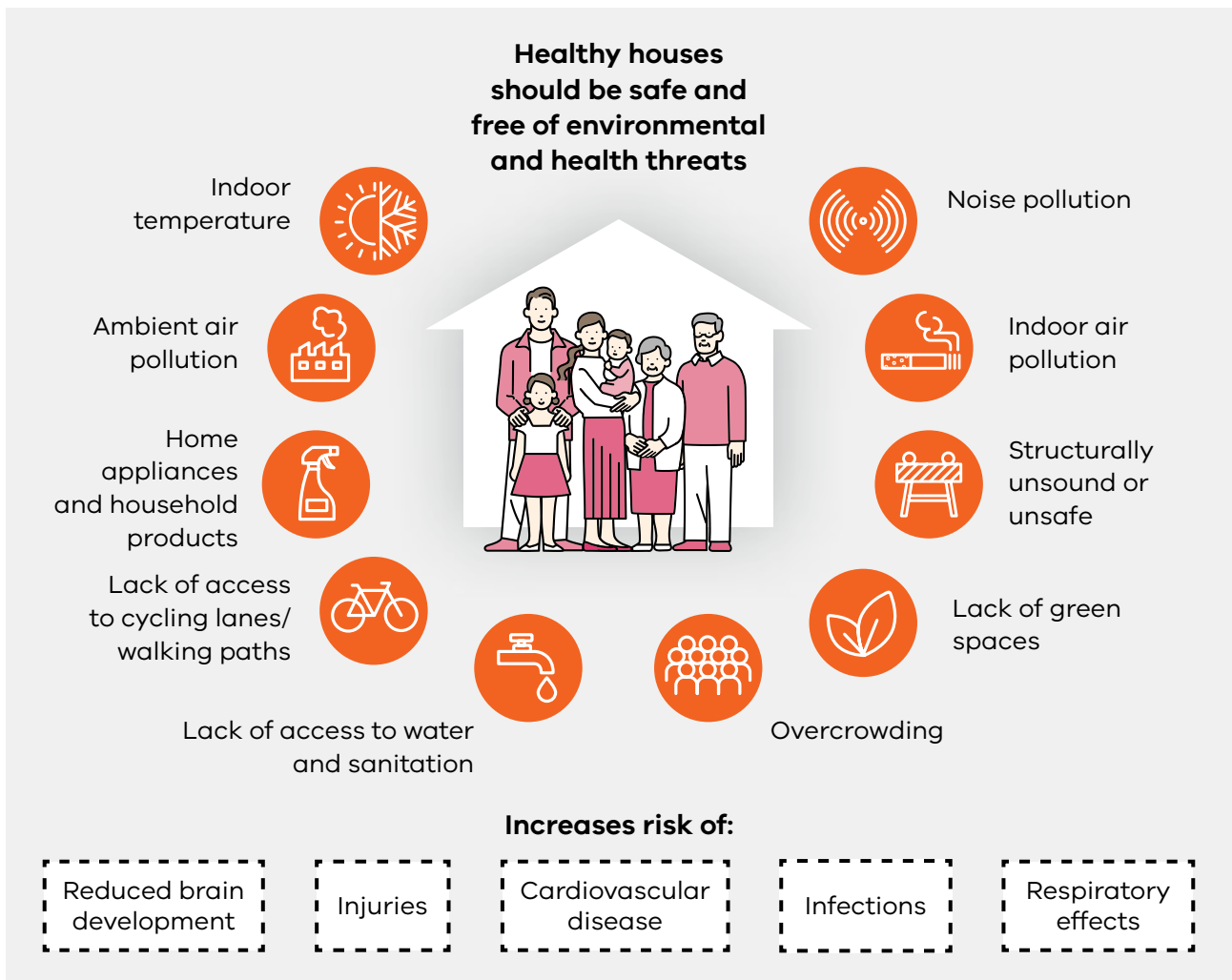
Population growth increases the demand for housing. Improving housing conditions and reducing health risks in the home is essential for protecting public health and maintaining wellbeing (World Health Organization, 2018).

In addition, housing affordability and accessibility is connected to wellbeing.

### Guidelines on housing and health

The World Health Organization (WHO) publication, *Housing and health guidelines* (2018), strongly recommends that countries consider strategies for preventing or reducing household crowding, increasing accessibility for people with functional impairments, improving home safety, and avoiding injuries.

Figure 7. Housing and health risks



The WHO guidelines also recommend safe and well-balanced indoor temperatures to protect people from extremes of heat and cold.

Poor housing conditions create multiple health risks. Inadequate housing also tends to be energy inefficient for cooking, heating, and cooling – creating health risks for residents and increasing climate emissions (WHO, 2019).

### Time spent indoors

Research shows that:

- Australians spend 80 to 100 per cent of their time indoors (at work and at home)
- 42 per cent of women and 22 per cent of men spend more than 80 per cent of their time at home
- time spent indoors increases with age (enHealth, 2012).



Australians spend **80–100%** of their **time indoors**



**42% of women** and **22% of men** spend over **80%** of their time at home



Time spent indoors **increases with age**

### Indoor air quality

The National Health and Medical Research Council (NHMRC) defines indoor air as air within a building occupied for at least one hour by people of varying states of health. This can include offices, classrooms, shopping centres, hospitals and homes. Indoor air quality can be defined as the totality of attributes of indoor air that affect a person's health and wellbeing.

Indoor air can contain synthetic and naturally occurring substances – pollutants or allergens – that may affect health. Pollutants and allergens can include dust, mould spores, smoke and combustion products, and volatile organic compounds (VOCs).

Whether a source of indoor air pollution is a problem or not for health and wellbeing depends on:

- the type of air pollutant (or allergen)
- the amount and rate at which it is released from its source
- the degree of available ventilation to remove it from indoors
- the leakiness of the home if the pollution source is outside
- the sensitivity of the person and any pre-existing conditions (Department of Industry and Science 2014; Caitlin McGee, 2020).

Common sources of indoor air pollutants include various human indoor activities, household products, environmental conditions – building construction materials, ventilation, and heating and cooling systems – and external factors (from outdoors).

Indoor air pollutant levels:

- can sometimes be higher than levels found outdoors
- may affect people's health, and in some cases safety
- in workplaces are managed through occupational health and safety legislation for workers
- from household appliances, are generally regulated by manufacturing design, compliance with instructions for use (including maintenance and consumer legislation)
- from use of consumer products, are minimised by following safe use instructions on the product label
- due to personal hobbies or behaviours (including the potential misuse of materials or products) can also affect indoor air quality and expose people to health hazards. This can be prevented or minimised with community information and guidance.

### **Sensitivity to air pollutants**

Some groups of people are more sensitive to air pollutants. These groups include young children, people over the age of 65, those with pre-existing respiratory or cardiovascular disease, and those who are sensitised to a substance (allergen).

Symptoms associated with poor indoor air quality can last for a short period of time or be prolonged. They can range from mild effects (such as eye, nose and throat irritation, headaches, and dizziness) to more severe effects (such as asthma and allergic responses).

Exposure to some indoor air pollutants (such as formaldehyde and tobacco smoke) can increase the risk of developing cancer.

### **Indoor air quality in Victoria**

A CSIRO and Bureau of Meteorology study of indoor air pollutants in 40 typical homes in Melbourne (in temperate urban areas) in 2008 and 2009 found concentrations of indoor air pollutants lower or comparable to concentrations found in previous Australian studies (Commonwealth of Australia 2011; Cheng et al, 2011).

Weekly average concentrations of carbon dioxide, carbon monoxide, nitrogen dioxide, formaldehyde, other carbonyls, BTEX (benzene, toluene, ethylbenzene and xylene), and total volatile organic compounds were higher indoors than outdoors, whereas PM<sub>10</sub> fine particles, ozone and fungi concentrations were higher outdoors.

In dwellings using gas appliances for cooking, levels of carbon dioxide, carbon monoxide, nitrogen dioxide, PM<sub>2.5</sub>, formaldehyde, benzene and total volatile organic compounds were higher than in households that only used electric cooking appliances.

In addition, dwellings located close to busy roads were more likely to have higher levels of nitrogen dioxide indoors than those located far from busy roads.

Australia does not have indoor air quality guideline values. As a consequence, Australia only has a general comparison of indoor and outdoor air pollutant concentrations.

## Heat health

The Bureau of Meteorology and Victorian Department of Health define a heatwave as a period of three or more consecutive days of extreme heat.

### Heat health and Victoria's changing climate

Victoria's climate has warmed by just over 1.0°C since official records began in 1910 (DELWP, 2019). Victoria has also experienced an overall increase in the frequency of unusually hot days, as shown in Figure 8.

By the 2050s, if the current rate of global warming continues, Victoria could experience around double the number of very hot days each year compared with the 1986–2005 median (DELWP, 2019).

Figure 9 shows the 2050 projections for the number of very hot days per year in three selected cities: Melbourne, Bairnsdale, and Mildura compared with the 1986–2005 median.

There are reports that Victoria is tracking towards the high end of climate projections, with potentially devastating impacts on Victorians, the economy and society (DELWP, 2019).

### Health impacts

Anyone can be affected by heatwaves. Particularly susceptible people include:

- the elderly and very young people
- people with existing chronic health conditions
- people required to be physically active for employment
- people who are socially isolated
- low-income households.

Extreme heat and heatwaves can have significant impacts on health. The most common forms of extreme heat illness incidences are:

- heat cramps, heat exhaustion, and heat stroke
- dehydration
- exacerbation of a pre-existing medical condition.

Heatstroke is a medical emergency that can result in permanent damage to vital organs, or even death, if not treated immediately (DELWP, 2018a).

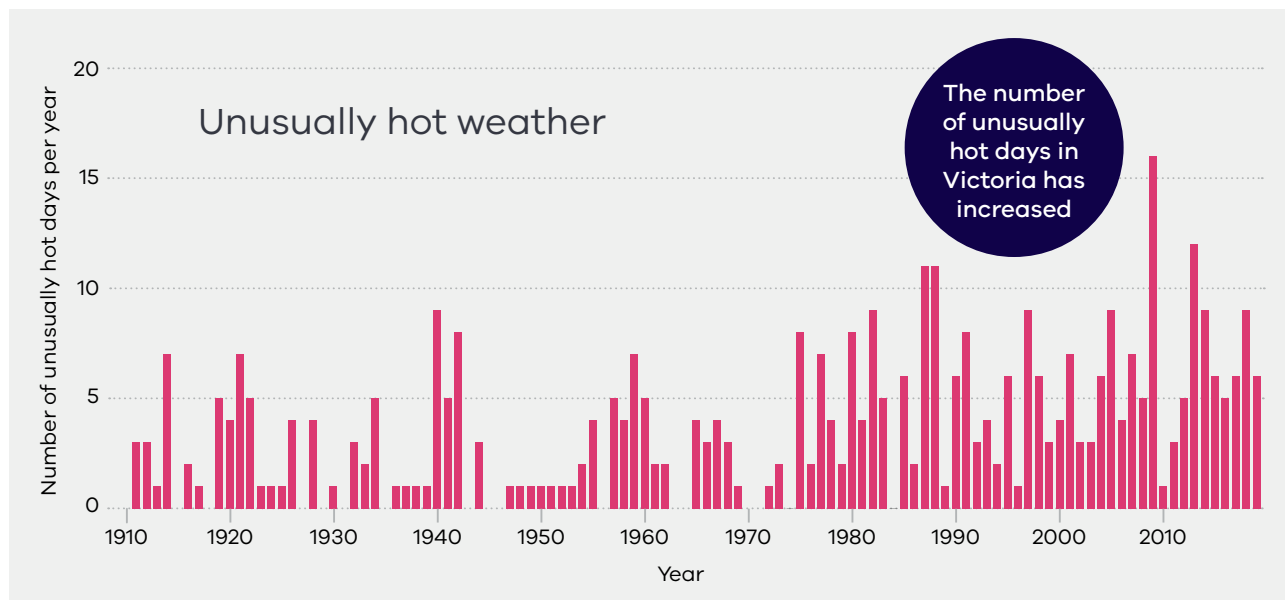
Extreme heat can also exacerbate pre-existing medical conditions, including heart and kidney disease, asthma, and other respiratory illnesses (DHHS, 2018a).

Other health impacts include increased risk of drowning as people attempt to cool off, and an increased incidence of foodborne gastroenteritis associated with higher ambient temperatures. Extreme heat is also associated with other environmental hazards that can impact health, notably power outages and bushfires.

In 2009 and 2014, major heatwaves had catastrophic impacts on the health of Victorians. It is estimated that heatwaves caused 374 excess deaths in 2009 and 167 in 2014 (DHHS, 2018a).

Extreme heat affects all parts of the health system, with ambulance, emergency departments, and community health sectors particularly affected (Natural Capital Economics, 2018).

**Figure 8. Days per year when Victorian average temperature is unusually hot. Unusually hot days are those above the 99th percentile of each month from the years 1910 to April 2019 (DELWP, 2019)**



**Figure 9. Number of very hot days per year in three Victorian cities comparing the 1981–2010 median with projections for 2050s**



Prevention is the best way to manage heat-related illness. Tips to prevent heat stress include:

- Drink plenty of water
- Avoid exposure to heat
- Protect yourself outside ('slip, slop, slap' to cover skin, 'seek' shade and 'slide' on sunglasses)
- Plan ahead
- Don't leave kids, older people or pets in cars
- Stay cool
- Check in on others
- Prepare for power failure.

### Find out more

For more information about heat, its impacts upon health and what you can do to prepare for it, access the Better Health Channel.

Survive the heat – Better Health Channel  
<<https://www.betterhealth.vic.gov.au/heat>>

Heat stress and heat-related illness – Better Health Channel  
<<https://www.betterhealth.vic.gov.au/health/healthyliving/heat-stress-and-heat-related-illness>>

How to cope and stay safe in extreme heat – Better Health Channel  
<<https://www.betterhealth.vic.gov.au/health/healthyliving/how-to-cope-and-stay-safe-in-extreme-heat>>

### Economic impacts

It was estimated that heatwaves cost Victoria \$87 million annually in 2018. These costs are projected to increase significantly due to the impact of climate change (Natural Capital Economics, 2018).

These economic impacts are felt across the Victorian economy, including in the construction, electricity, health, manufacturing, mining, tourism, transport, agriculture, and water sectors. However, the greatest impact is experienced by the agriculture sector (Natural Capital Economics, 2018). The increased impact of climate change on agriculture will lead to higher food production costs for Victoria.

The increased frequency and severity of heatwaves also affects the ability of individuals to pay energy bills.

Many Victorians already struggle to pay energy bills (Victorian Council of Social Service, 2017). The number of people expected to experience bill stress during summer will increase as heatwave frequency and severity increase.

### Extreme heat days in Victoria

The Chief Health Officer issues a heat health alert when the heat health temperature threshold is reached for a specific weather district.

Victoria's heat health temperature thresholds are based on academic research, as well as past experience and practice. The risk of increased mortality increases when average temperatures rise above heat health temperature thresholds (DHHS, 2018b).

Figure 10 shows the number of Heat Health Alerts issued by Victorian weather forecast district in 2019. It includes two separate 2019 summer periods: the first ran January to March, the second ran November to December.

Between January–March 2019, the Chief Health Officer issued 52 heat health alerts across nine weather districts for 14 forecast extreme heat days. Four heatwaves (three or more days of extreme heat) were forecast during this period, including:

- 14–17 January 2019 for Mallee, North Central and Northern Country weather districts
- 14–18 January 2019 for North East weather district
- 23–25 January 2019 for Mallee and North East weather districts
- 28 February to 2 March 2019 for Central weather district.



Between November–December 2019, the Chief Health Officer issued 32 heat health alerts for eight forecast extreme heat days. On 28–29 December, extreme heat days were forecast for all of Victoria. Two heatwaves (three or more days of extreme heat) were forecast during this period, including:

- 27–29 December for Mallee and Northern Country weather districts
- 27–30 December for North East weather district.

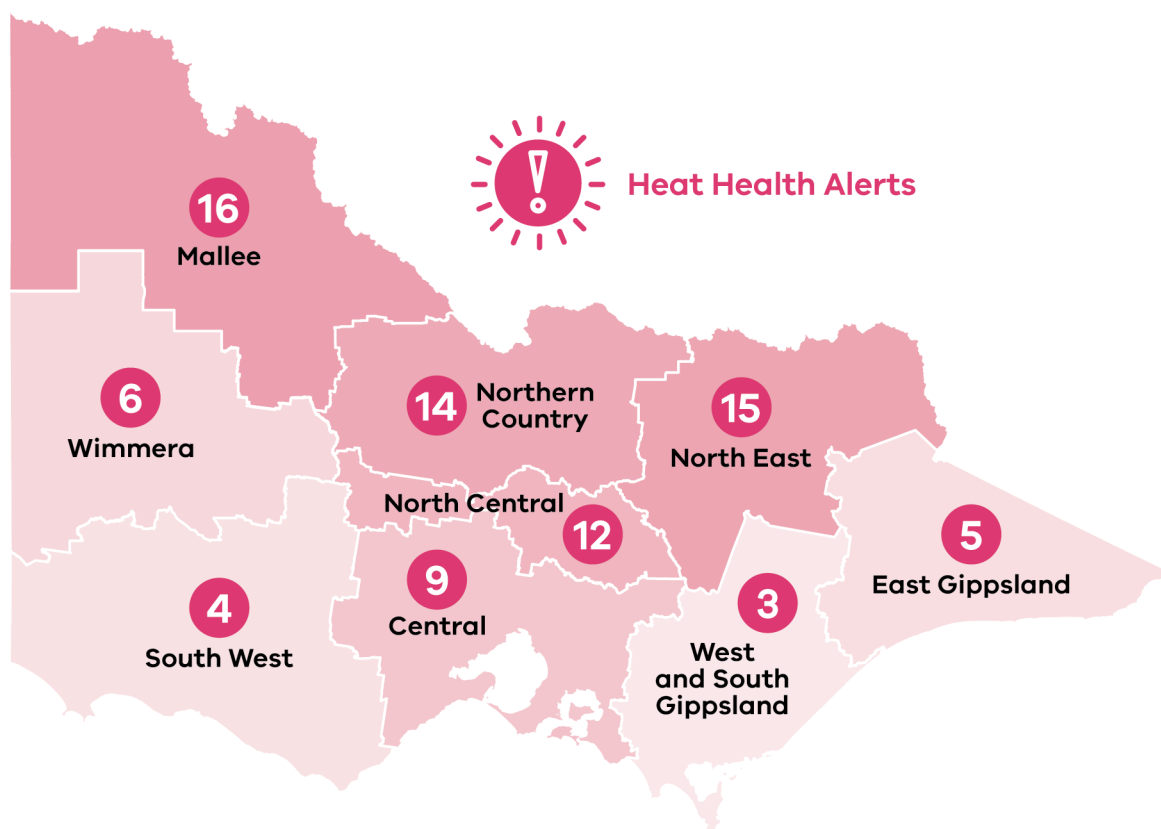
### Victoria’s heat health plan

The *Heat health plan for Victoria* <<https://www.health.vic.gov.au/publications/heat-health-plan-for-victoria>> outlines the actions the Department of Health takes to prepare for

and respond to extreme heat. It also details how local government and the health and human services sectors should prepare and respond to extreme heat.

These actions include the *Heat health alert* system and a comprehensive communications and engagement strategy. The strategy includes the state-wide *Survive the Heat* campaign, which aims to minimise the health impacts of extreme heat on the Victorian community, Ambulance Victoria, and health services by encouraging Victorians and visitors to protect themselves and those in their care during extreme heat.

**Figure 10. Number of Heat Health Alerts issued corresponding with Victorian weather forecast districts**



Please note: Total counts include two separate 2019 summer periods i.e. January–March 2019 and November–December 2019.



## Thunderstorm Asthma Program

On 21 November 2016, Victoria experienced the world's largest epidemic thunderstorm asthma event. Thousands of people developed breathing difficulties in a short period of time. Following this event, the former Department of Health and Human Services (now Department of Health) developed a multi-faceted, comprehensive Epidemic Thunderstorm Asthma Program to address potential future impacts on the community and the Victorian health system.

The program includes:

- A [public health campaign](https://www.betterhealth.vic.gov.au/campaigns/thunderstorm-asthma) to raise awareness of thunderstorm asthma, help the community prepare for the grass pollen season and improve asthma and hay fever management – including an [epidemic thunderstorm asthma campaign toolkit](https://www.health.vic.gov.au/environmental-health/epidemic-thunderstorm-asthma-campaign-toolkit) to raise public and health professional awareness of thunderstorm asthma preparedness messages.
- A [Victorian epidemic thunderstorm asthma risk forecasting system](https://www.health.vic.gov.au/environmental-health/epidemic-thunderstorm-asthma-risk-forecast), including an expanded Victorian pollen monitoring network.
- Resources for health professionals, including expert clinical guidelines to identify and manage those at increased risk.
- A Real-time Health Emergency Monitoring System, helping Victoria more quickly recognise and better manage a surge in demand on health services
- Revised state health emergency response arrangements to improve how health services plan, communicate, and work during emergencies – and better meet community health needs.
- Research to better understand the phenomena of epidemic thunderstorm asthma.

## Sunset Review of Public Health and Wellbeing Regulations

Victorians enjoy one of the highest standards of health and wellbeing in the developed world. Those standards could not be achieved without laws and regulations that protect and promote public health and wellbeing. In 2019, the Public Health and Wellbeing Regulations 2009, which were made under the Public Health and Wellbeing Act 2008, were due to expire (sunset). Before they expired, the regulations were reviewed and new Public Health and Wellbeing Regulations drafted following a rigorous impact assessment and public consultation process.

The Public Health and Wellbeing Regulations 2019 provide a framework for businesses, councils, the Department of Health and individuals to protect the health and wellbeing of Victorians. The regulations cover a range of measures that prevent and respond to the spread of infectious diseases. The regulations also minimise public health risks associated with certain businesses, such as aquatic facilities, tattooists, and businesses that perform skin penetration procedures.

Due to increased public health risks from climate change, significant amendments were made to the regulations. Those amendments included expanding the regulations that control vector-borne infectious disease risks. Climate change, urban development, and increased global travel are influencing the spread and distribution of disease-causing pathogens and disease vectors, such as mosquitos. The new regulations allow for the control of emerging and potential vector-borne disease risks – reducing the risk of vector-borne infectious diseases. The amendments will help prevent and minimise infectious diseases caused by mosquitoes or other disease vectors and allow for a more rapid response to emerging and potential disease threats.

Below is a summary of the full list of areas covered in the 2019 review:

- arbovirus control (vector-borne infectious disease control)
- registered premises (hairdressing, cosmetic application, beauty therapy, colonic irrigation, skin penetration and tattooing) in regard to infection control
- aquatic facilities (see the 'Aquatic facilities' section of 'Chapter 4 – Water quality and safety' for more information about aquatic facilities)
- cooling tower systems
- legionella risks in certain premises (water delivery systems)
- pest control (licenses, qualifications, and training)
- notification of infectious diseases, micro-organisms, and medical conditions
- immunisation and exclusions (infectious disease prevention in schools and children's services)
- closed court orders for prescribed diseases
- information to sex workers and clients upon request
- consultative councils.

### Find out more

For more information about the *Sunset Review of Public Health and Wellbeing Regulations 2019*: *Public Health and Wellbeing Regulations 2019* on the department's website, [health.vic <https://www.health.vic.gov.au/legislation/public-health-and-wellbeing-regulations-2019>](https://www.health.vic.gov.au/legislation/public-health-and-wellbeing-regulations-2019).

## References

Australian Institute of Health and Welfare (AIHW) 'Data update: Short term health impacts of the 2019–20 Australian bushfires', Australian Government, Canberra, (last updated 12 November 2021).

Bureau of Meteorology 2018, 'Understanding heatwaves', Bureau of Meteorology, Australian Government, Canberra.

Cheng M, Galbally I, Gillett R, Keywood M, Lawson S, Molloy S and Powell J 2011, 'Indoor air project: part 1 main report: indoor air in typical Australian dwellings', Commonwealth Government of Australia, Department of the Environment, Water, Heritage and the Arts, Canberra.

Coates L, Haynes K, O'Brien J, McAneney J and Dimer de Oliveira F 2014, 'Exploring 167 years of vulnerability: An examination of extreme heat events in Australia 1844–2010', *Environmental Science & Policy*, vol. 42, October 2014.

Commonwealth Government of Australia 2011, 'Indoor air quality: Australian state of the environment report', Commonwealth Government of Australia, Canberra.

Department of Environment and Energy 2012, 'Your home: Australia's guide to environmentally sustainable homes', Commonwealth Government of Australia, Canberra.

Department of Environment, Land, Water and Planning 2019, 'Victoria in future 2019: population and household projections to 2056', State Government of Victoria, Melbourne.

Department of Environment, Land, Water and Planning 2019, 'Victoria's climate science report 2019', State Government of Victoria, Melbourne.

Department of Health and Human Services 2018a, 'Survive the heat', State Government of Victoria, Melbourne.

Department of Health and Human Services 2018b, 'Heat health alerts', State Government of Victoria, Melbourne.

Department of Industry and Science 2014, Caitlin McGee 2020, 'Australia's Guide to Environmentally Sustainable Homes', Commonwealth Government of Australia, Canberra (viewed on 21 September 2022).

D'Souza RM, Becker NG, Hall G, Moodie KB. 'Does ambient temperature affect foodborne disease?' *Epidemiology*. 2004 Jan;15(1):86–92.

enHealth 2012, 'Australian exposure factor guidance: guidelines for assessing human health risks from environmental hazards', Commonwealth Government of Australia, Canberra.

Environment Protection Authority Victoria 2018, 'Air pollution in Victoria: a summary of the state of knowledge' August 2018, Environment Protection Authority Victoria, Melbourne.

Environment Protection Authority Victoria 2020, 'Air monitoring report 2019 – Compliance with the National Environment Protection (Ambient Air Quality) Measure', Publication 1875, August 2020, Environment Protection Authority Victoria, Melbourne.

Natural Capital Economics 2018, 'Heatwaves in Victoria: a vulnerability assessment', report prepared for Victorian Department of Environment, Land, Water and Planning, Melbourne.

Ryd H 1991, 'My home is my castle: psychological perspectives on "sick buildings"', *Building and Environment*, vol. 26, no. 2.

State Government of Victoria 2018, 'Gas Safety (Gas Installation) Regulations', State Government of Victoria, Melbourne.

Victorian Council of Social Service 2017, 'Power struggles: everyday battles to stay connected', Victorian Council of Social Service, Melbourne.

World Health Organization 2018, 'Housing and health guidelines', World Health Organization, Geneva.

World Health Organization 2019, 'Healthy housing – Raising Standards, reducing inequalities', World Health Organization, Geneva.



## Chapter 4 – Water quality and safety

The *Safe Drinking Water Act 2003* and the *Safe Drinking Water Regulations 2015* provide the framework to ensure drinking water supplied by water agencies is safe and aesthetically pleasant to drink. Safe drinking water is essential for maintaining public health and supporting the health and wellbeing of communities.

The *Health (Fluoridation) Act 1973* allows the department to oversee the extension of water fluoridation in Victoria and the compliance of fluoridation plants.

Public aquatic facilities are important for maintaining and promoting active lifestyles and providing health benefits. Public aquatic facilities are regulated under the *Public Health and Wellbeing Act 2008* and the *Public Health and Wellbeing Regulations 2019* <<https://www.health.vic.gov.au/legislation/public-health-and-wellbeing-act-2008>>.

### Safe drinking water

Access to safe, good quality drinking water is fundamental to community and individual health and wellbeing. In 2019, Victoria's safe drinking water regulatory framework performed well.

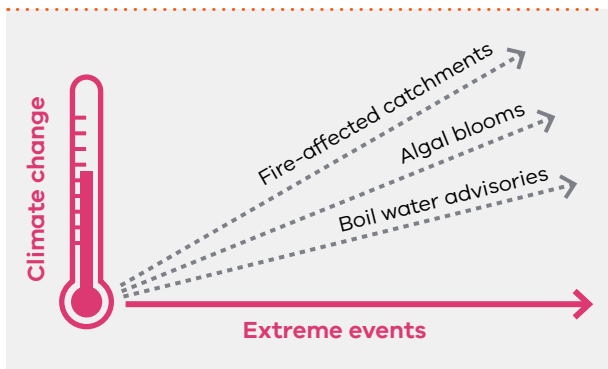
One highlight was the Mallee Towns Drinking Water Supply Project. Under the project, Grampians Wimmera Mallee Water upgraded regulated (non-potable) supplies to Brim, Beulah and Woomelang in August 2019, returning these communities to reticulated drinking water.

Climate change is an ongoing challenge because it will deliver warmer temperatures, more extreme events and alter water flow

regimes. These changes will increase the risk of harmful algal blooms, floods and bushfires – creating challenges for securing ongoing drinking water supplies that are safe and aesthetically acceptable.

In 2019, the department supported water agencies responding to drinking water incidents, including:

- The 2019 bushfires. During the bushfires, the department delivered proactive contingency planning and emergency response arrangements. In addition, the department enabled East Gippsland Water to cart drinking water to Buchan, maintaining a safe supply of drinking water for the community. The department also helped Melbourne Water protect water quality within the Upper Yarra Reservoir from the impact of debris within burnt areas of the catchment.
- Algal blooms within the Goulburn system. The algal blooms created water treatment challenges at Goulburn Valley Water's Tatura, Kyabram, Rushworth and Tongala water treatment plants. The ability to operate the water treatment plant at Tongala was affected and – due to concerns about the removal of microorganisms – Goulburn Valley Water issued a boil water advisory to the township.
- A boil water advisory in Red Cliffs. The boil water advisory was issued due a blue-green algal bloom in the Murray River. The algal bloom compromised Lower Murray Water's Red Cliffs water treatment filtration system's capability to reliably remove microorganisms.
- A boil water advisory in Oxley. The boil water was issued to customers in Oxley as a result of the inadequate disinfection of drinking water at North East Water's Oxley water treatment plant.



The department continued to implement its Better regulatory practice framework. The framework encompasses a risk-based approach, with the department providing regulatory oversight in collaboration with stakeholders and water agencies.

## Water fluoridation

A person's oral health is key to their overall general health and wellbeing. Community water fluoridation is the most effective population-wide intervention to prevent tooth decay.

Water agencies operating water fluoridation plants undertook a gap analysis of their plants' design, operation and performance against the requirements of the Code of practice for fluoridation of drinking water supplies. (Second edition published in 2018.)

The department approved the addition of fluoride to the Kallista drinking water supply. This project delivered for the first time fluoridated drinking water to approximately 16,000 people in Kallista, Macclesfield, Menzies Creek, Monbulk, The Patch, Avonsleigh, Clematis, Cockatoo, Emerald, and Gembrook.



**10 Victorian towns** received **fluoridated** drinking water for the first time

## Aquatic facilities

Public aquatic facilities are vital for maintaining and promoting active lifestyles and improved health and wellbeing. However, aquatic facilities have also been associated with outbreaks of illness.

Aquatic facility users, especially children, can be affected by disease-causing microorganisms that are passed through contaminated pool water and contaminated surfaces, as well as through person-to-person contact.

Outbreaks of illness associated with aquatic facilities, particularly cryptosporidiosis, are expected to increase with climate change because patronage increases on hot days. Climate change may also affect the availability of water and energy.

The water restrictions imposed on aquatic facilities during the Millennium drought led the aquatics industry to find novel solutions to conserve water including rainwater for topping up pools and reusing filter-backwash water. These initiatives have the potential to increase public health risk.

## Public health and wellbeing regulations

In 2019, the department reviewed the Public Health and Wellbeing regulations (the Sunset Review).

The purpose of the Sunset Review was to strengthen the aquatic facility regulatory provisions for inclusion in the Public Health and Wellbeing Regulations 2019 and address current and emerging water quality risks to aquatic facilities.

Key changes to the regulations included:

- broadening the definition of an aquatic facility to include new and emerging aquatic facilities that pose a risk to public health
- the risk-based characterisation of aquatic facilities (category 1 and category 2)
- the registration of category 1 aquatic facilities with council, commencing 14 December 2020



- empowering councils to issue infringement penalties to facilitate compliance
- the duty to manage the risks to human health arising from pathogenic microorganisms in the water in accordance with the regulations and the *Water quality guidelines for public aquatic facilities – managing public health risks*
- broadening the outbreak response provision for pathogenic microorganisms
- the procedure for responding to non-compliance with microbiological parameters.

### **Water quality guidelines for public aquatic facilities – managing public health risks**

The department published *Water quality guidelines for public aquatic facilities – managing public health risks* to help organisations and people who operate public aquatic facilities reduce risks to public health. The guidelines also advise local and state government environmental health officers on their regulatory and advisory roles. In addition, the water quality guidelines assist aquatic facilities to develop their water quality risk management plan to address public health risks relating to water quality; describe treatment and monitoring requirements to manage microbial risk; provide practical information for operators (including a trouble shooting guide); provide an inspection checklist; and outline healthy swimming practices to maintain water quality and minimise contamination.

### **References**

Drinking water quality annual reports <<https://www.health.vic.gov.au/water/drinking-water-quality-annual-reports>>.



## Chapter 5 – Food safety

The role of the department's Food Safety Unit (FSU) is to: protect the community from foodborne illness and food-related harm; support public health through strategic regulatory policy development; and influence thinking, policy and programs that create a healthier community.

The FSU is a multi-disciplinary unit with expertise in food sciences, food technology, microbiology, chemistry, nutrition/ dietetics, social science, public health, regulatory policy, and environmental health. It works closely with local councils and peak organisations, Victorian and national food regulators, as well as a range of public health areas in the department. Those departmental public health areas include communicable diseases teams and the Office of the Chief Health Officer – especially where outbreaks of illness are suspected to be foodborne.

Key activities in 2019 included: the advancement of both the National and Victorian Foodborne Illness Reduction strategies; an update on the Anaphylaxis Notification Scheme; and the establishment and commencement of work by the Food Safety Reform Program. Reporting on the implementation and embedding of the Victorian Kilojoule Labelling Scheme can be found in the Healthy eating section of 'Chapter 9 – Healthy living'.

### The Australian Foodborne Illness Reduction Strategy 2018–2021

In April 2017, the Australia and New Zealand Ministerial Forum on Food Regulation (the Forum) agreed that, overall, the food regulation system was producing strong food safety outcomes. In addition, the Forum identified three priority areas for 2018–2021 and beyond.

One of these priorities was to reduce foodborne illness, particularly foodborne illness related to campylobacter and salmonella. Forum Ministers – including the Victorian Minister for Health and the Victorian Minister for Agriculture – requested the development of an Australian strategy, noting that New Zealand had an existing strategy for both pathogens. The Ministers recognised that success requires a concerted national effort, collaboration and partnerships across the food supply chain. The *Australian Foodborne Illness Reduction Strategy 2018–2021* was developed and endorsed on 29 June 2018.

### The Victorian Foodborne Illness Reduction Strategy 2019–2022

With the *Australian Foodborne Illness Reduction Strategy 2018–2021* endorsed it was timely to update Victoria's foodborne illness strategy. The *Victorian Salmonella Strategy 2017–2020* was already in place, but the department reviewed and updated the state-wide strategy, releasing the updated *Victorian Foodborne Illness Reduction Strategy 2019–2022*.

The updated strategy is focused on the reduction of foodborne illness arising from salmonella and campylobacter, and aligns with the national strategy. Due to recent outbreaks and higher mortality rate, the Victorian strategy also includes infections with listeria spp.

More than 200 common and often preventable diseases can be spread through food, with severe or fatal consequences. Disease outbreaks can create a substantial burden for the economy and community. Often, the most serious complications arise in the most vulnerable populations – including children, pregnant women, older people, and people with weakened immune systems.

Campylobacter, which is the most notified cause of gastroenteritis in Australia, was the most notified enteric condition in Victoria, with 6,669 notifications received in 2018 and 7,292 in 2019 (Table 1). *Foodborne Illness in Australia – annual incident circa 2010* estimated the median number of domestically-acquired cases of gastroenteritis due to campylobacter in Australia at 234,000. Of those 234,000 cases – which included 3,200 hospitalisations and three deaths – 77 per cent were foodborne.

Foodborne disease outbreaks caused by salmonella in Australia have significantly increased over the past 20 years. Compared to similar countries, Australia now has one of the highest rates of salmonella. There are an estimated 56,200 cases of salmonellosis a year, including 2,100 hospitalisations and 15 deaths. In Australia, 72 per cent of salmonellosis are considered foodborne. In 2018, Victoria had 3,075 notifications for salmonellosis, followed by 3,198 in 2019 (Table 1).

Almost all cases of listeriosis are foodborne transmissions. In 2017, Victoria had 151 notifications of listeria monocytogenes in food, with 16 reported non-perinatal cases of listeriosis resulting in 14 hospitalisations

and two deaths. In addition, there were three perinatal cases, one of which resulted in foetal death. While the incidence of illness related to campylobacter and salmonella are considerably higher than listeria, case-fatality for listeriosis can be up to 30 per cent for vulnerable populations, compared with much lower rates for mortality attributed to campylobacteriosis and salmonellosis. There were 27 notifications of invasive listeriosis in 2018, followed by 12 in 2019 (Table 1).

Foodborne illness can have a significant impact on public health, wellbeing, food production, and processing industries. In Australia, an estimated 4.1 million domestically-acquired cases of foodborne gastroenteritis occur every year, at an estimated annual cost of \$1.2 billion.

A safe food supply chain is critical for food security and consumer trust, domestically and internationally. The *Victorian Foodborne Illness Reduction Strategy 2019–2022* aims to protect consumers and the food industry from the impact of foodborne disease.

### Find out more

Find out more about Food Safety at:

*Victorian Foodborne Illness Reduction Strategy 2019–2021* on the department's website, [health.vic <https://www.health.vic.gov.au/publications/food-surveillance-2018-2019>](https://www.health.vic.gov.au/publications/food-surveillance-2018-2019).

Joint Australia New Zealand Food Safety Regulation Framework, including the Forum (now called the Minister's Meeting), on the department's website [health.vic <https://www.health.vic.gov.au/food-safety/food-safety-laws-and-regulations>](https://www.health.vic.gov.au/food-safety/food-safety-laws-and-regulations).

**Table 1. Human case notifications of infection caused by foodborne pathogens in Victoria**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Campylobacter	6,636	6,798	6,004	5,890	7,236	8,243	8,238	6,863	6,669	7,292
Listeria	28	19	35	24	21	22	25	19	27	12
Salmonella	2,262	2,695	2,505	2,943	3,692	3,467	4,088	3,229	3,075	3,198

## Anaphylaxis Notification System

### Background

Anaphylaxis is a severe, potentially life-threatening hypersensitivity reaction characterized by rapid onset of breathing or circulatory problems that may be accompanied by skin and mucosal changes, and other systemic symptoms (Safer Care Victoria, 2019).

Since 1 November 2018, Victorian hospitals have been required to notify anaphylaxis cases presenting for treatment. Cases of anaphylaxis attributed to packaged food must be notified immediately after initial diagnosis, and within five days if anaphylaxis is attributed to any other suspected cause. Anaphylaxis notifications are made through an electronic web form, which is integrated into the department's database. This notification system, which is a world first, has resulted in multiple food recalls and a growing dataset to inform preventative strategies.

The *Public Health and Wellbeing Act 2008* was amended to require Victorian public and private hospitals to make these notifications to the Victorian Department of Health. The amendments were in response to the Victorian coroner's recommendation following a child's death from anaphylaxis after consuming mislabelled food.

### Notification system objectives

The notification system seeks to minimise morbidity and mortality associated with anaphylaxis by identifying mislabelled packaged foods in the marketplace and poor allergen management at council-registered food premises serving unpackaged food.

The aim of the system is to reduce public health risks by facilitating timely and appropriate public health action. In addition, investigations may lead to: the provision of advice, information, and education on allergen management; the issuing of a Food Act order; or prosecution.

### Investigation and response

Regarding investigations, the FSU Investigation and Compliance team leads the assessment, investigation, and implementation of appropriate public health responses. The team collaborates with the epidemiologist, hospitals, food regulators, and local councils.

### Outcomes

In 2019, 2,054 cases of anaphylaxis were notified. Those cases equate to a monthly average of 171 and a rate of 33 per 100,000 population.

Cases attributed to consumption of food account for 1,240 cases – or 60 per cent of total cases. Of these cases:

- 364 (29 per cent) were due to packaged food
- 458 (37 per cent) were due to unpackaged food from food premises
- 418 (34 per cent) were due to food/other.

The assessment and investigation of cases attributed to the consumption of food resulted in two packaged food recalls and 92 referrals to local councils for further investigation.

There were 814 notified or 40 per cent of total cases attributed to suspected causes other than consumption of food. Those cases included:

- unknown cause: 320 (16 per cent)
- drug: 255 (12 per cent)
- insect venom: 163 (8 per cent)
- other cause: 71 (3 per cent)
- vaccine: 4 (<1 per cent)
- blood-derived product: 1 (<1 per cent).

## Introduction of the Food Safety Reforms Program

The Small Business Regulation Review (Retail) is a key component of the Victorian Government's commitment to reduce unnecessary regulatory burden on small business. The review sought to understand small business experience in terms of starting a business, particularly the regulatory requirements. The review involved a broad engagement with the small business sector, including surveys, industry round tables, written submissions, individual meetings, and interviews.

The review identified three key objectives:

1. Make it is easier and faster to comply with relevant regulation.
2. Provide confidence and certainty in the regulatory system.
3. Ensure unique regulatory compliance needs are met.

The review recommended several reforms to help food businesses and local government better understand, apply food safety regulation, and meet their obligations under the Victorian *Food Act 1984*. These recommendations led to the creation of the Food Safety Reform Program (the Program) in the FSU.

The Program is implementing changes over the next few years to make it simpler, clearer, and quicker for food businesses to operate in Victoria. The Program manages a group of interrelated projects under four main themes, each aligned to the key objectives of the review being 'quicker, simpler; clearer').

## Key achievements during 2019

Since June 2018, when the Program was officially launched, the FSU has engaged extensively with councils, food businesses, and the food industry via meetings and forums, as well as through regular website updates, newsletters, and flyers.

### Quicker

One of the key goals of the Program is to make it easier for food businesses and councils to manage the registration of food premises.

Streatrader, the FSU's online registration system for temporary and mobile food businesses, was revamped. The revamp made the system: less administratively burdensome for councils; quicker for businesses and community groups to participate in events at short notice; and easier for organisers to quickly access and manage their event registrations. Since May 2019, mobile and temporary food businesses can lodge a statement-of-trade one business day prior to an event with their principal and/or trading council.

### Simpler

Preliminary work focused on simplifying record keeping requirements for some types of food premises and working with local councils to review and improve the ways food premises are assessed and classified. The aim of this work was to develop an improved classification system that accurately classified food premises based on the level of risk their activities could pose to public health.

By implementing system changes to Streatrader, the FSU simplified how local councils record their assessments of mobile and temporary food premises, making it easier for Environmental Health Officers (EHOs) to capture and analyse data in real time.

In addition, work has commenced to make it simpler for local councils to access relevant information and guidance materials through the creation of a new, online information hub for EHOs and other local council staff.

## Clearer

In 2018 and 2019, the FSU worked with councils and food businesses to develop guidance materials on how to interpret and apply the Act. A range of guidance materials have been produced for councils, starting with a package addressing the enforcement tools available to EHOs under the Act. That information package includes a comprehensive enforcement guide, as well as a prosecution tool kit made up of case studies, an animation, podcasts, and templates.

The department also provided professional development and training for council staff and EHOs. The FSU held regular workshops across the state to encourage dialogue and peer-to-peer learning among EHOs, such as theoretical and practical training on risk-based assessments. The training was designed to give EHOs the skills to promote, embed, and deliver a consistent, risk-based approach to food safety assessments. This initiative was supported by the development of a guide and training program on risk-based food safety assessments. That guide and training program on risk-based food safety assessments aimed to address inconsistencies across Victorian local councils by providing a uniform approach to risk-based food safety assessments. By the end of 2019, half of Victoria's 79 councils had completed the training.

In addition to the training program and risk-based assessment guide, local councils were supported to implement a risk-based approach with the development of a food safety management policy template and associated guidance material.

## References

Safer Care Victoria 2019, *Anaphylaxis clinical care standard*, viewed on 15 September 2022, State Government of Victoria, Melbourne, <[https://www.safercare.vic.gov.au/sites/default/files/2019-02/Anaphylaxis%20Clinical%20Care%20Standard\\_WEB\\_0.pdf](https://www.safercare.vic.gov.au/sites/default/files/2019-02/Anaphylaxis%20Clinical%20Care%20Standard_WEB_0.pdf)>.





# Chapter 6 – Victoria’s population: Who we are

*Your health* highlights health and wellbeing trends and inequalities across Victorian populations. This section looks at the population profile of Victoria, and explores demographic trends and differences by age, gender, Aboriginal and Torres Strait Islander status, cultural diversity, income, and LGBTIQ+ status.

## Key statistics

With a population of 6.5 million in June 2019, Victoria is Australia’s second-most populous state after New South Wales (ABS 2018–19).

Victoria represents approximately 25 per cent of Australia’s population (ABS, 2019).

Melbourne’s population grew the fastest of all capital cities in the country in 2019, with an increase of 2.1 per cent. Net overseas migration was the major contributor to this increase in population (ABS 2018–19).

Victorians have the second-highest life expectancy at birth in Australia, close behind the ACT. Life expectancy at birth is 81.9 for males and 85.8 for females in Victoria (ABS, 2018–2020).

The proportion of Victorian adults who reported being in excellent or very good health was 40 per cent, while 21 per cent of Victorians reported being in fair or poor health (VAHI, 2021).

### Melbourne

was Australia’s  
fastest growing  
capital city,  
**increasing**  
**2.1%** in 2019



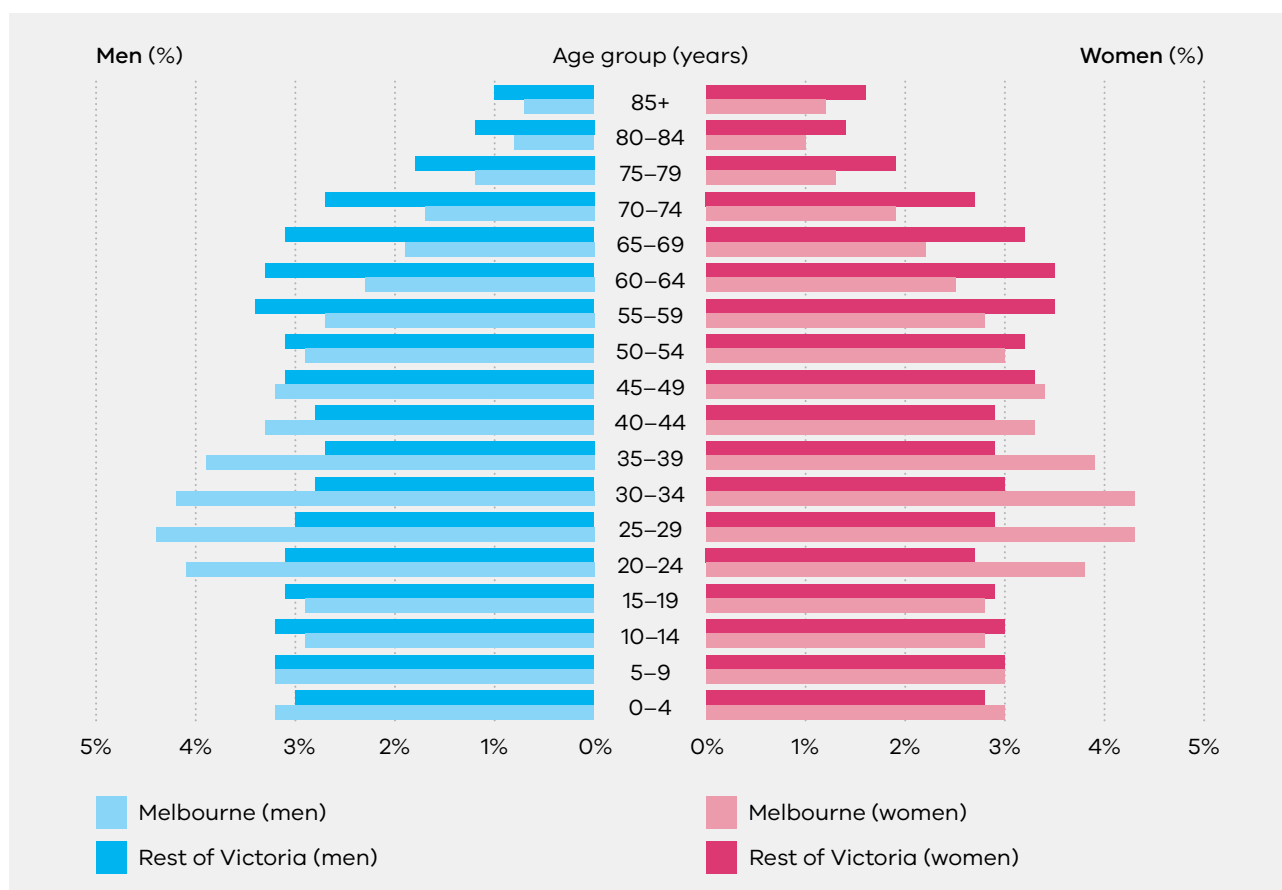
## Age and sex distribution

In June 2019, there were slightly more females (50.5 per cent of total Victorian population) than males (49.5 per cent) (ABS, 2019).

The median age of Victorians in June 2019 was 37 years – the same as 2018. Greater Melbourne had a younger age distribution than the rest of Victoria, as younger adults tend to migrate out of regional areas to pursue work and education in the capital city (ABS, 2019a).

Like many Western countries, the population is projected to increase. In June 2019, 15.5 per cent of Victorians were aged 65 years and over (ABS, 2019). By 2056, this figure is expected to reach 23.1 per cent (ABS, 2017-base).

Figure 1. Age and sex distribution, Victoria 2019



Source: Australian Bureau of Statistics, Regional population by age and sex 2019

## Aboriginal and Torres Strait Islander people living in Victoria

Aboriginal people living in Victoria are a strong and culturally diverse group, representing more than 250 language, social, or national groups from across Australia. In 2016, 47,788 Aboriginal people made up the Victorian Aboriginal Community, totalling approximately 0.8 per cent of the Victorian population. (ABS, 2016).



Victoria's Aboriginal Community of **47,788** makes up approximately **0.8%** of the population

Aboriginal people living in Victoria are a young demographic, with 95 per cent aged between 0 to 64 years. Between 2011–2016 there was a 12 per cent increase in the Aboriginal population, indicating this population is growing at a slightly faster rate than Victoria's total population, which increased by 11 per cent over the same period (ABS, 2016).

The department released the *Aboriginal and Torres Strait Islander summary surveillance of notifiable conditions in Victoria* interactive report in 2019. The report is refreshed daily. The department prioritises data completeness for 18 notifiable conditions for reporting completeness by the Communicable Diseases Network Australia due to the public health importance of those conditions in this population group.

## Aboriginal health and wellbeing reform

Korin Korin Balit-Djak (KKBD) is the primary source of Aboriginal reform for the health system in recognition of the need for self-determination across all areas of Government and in the community. Self-determination is the only policy approach that has produced effective and sustainable outcomes for Indigenous peoples, according to international and Australian evidence. (DHHS *Self-determination-scoping-paper*).

KKBD covers five domains relating to the health, wellbeing, and safety of Aboriginal people in Victoria:

- Aboriginal community leadership
- prioritising Aboriginal culture and community
- system reform across the health and human services sector
- safe, secure, strong families, and individuals
- physically, socially, and emotionally healthy Aboriginal communities.

## Find out more

Find out more about [Aboriginal Health](https://www.health.vic.gov.au/health-strategies/aboriginal-health) <<https://www.health.vic.gov.au/health-strategies/aboriginal-health>>.

Find out more about Aboriginal and Torres Strait Islander people Living in Victoria in 'Chapter 7 – Health inequalities'.

## Rural and regional Victorians

Victoria is largely an urbanised state, with 75 per cent of people living in Greater Melbourne and the other 25 per cent living in regional and rural Victoria (ABS, 2019).

From 2011–2016, Victoria’s 10 largest regional city municipalities all experienced population growth. The regional city growth ranged from an annual growth rate of more than 2 per cent (Greater Geelong and Wodonga) to 0.5 per cent in Latrobe and Horsham (DELWP, 2020).

People living in rural and regional areas can experience barriers accessing health care due to geographic spread, low-population density, limited infrastructure, and the higher costs of delivering rural and remote health care (AIHW, 2018). They can also be disproportionately affected by natural disasters such as droughts, bushfires, and floods.

## Cultural diversity

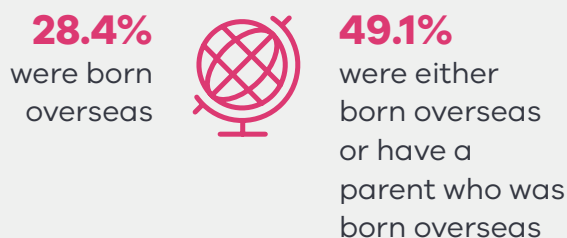
Victoria is one of the most culturally-diverse societies in the world. It is also among the fastest growing and most diverse states in Australia.

The proportion of overseas-born Victorian residents where English is not their primary language (LOTE) is 77.7 per cent. This is the highest for all Australian states and territories (DPC, 2017).

According to the 2016 Census:

- 28.4 per cent of Victorians were born overseas
- 49.1 per cent of Victorians were either born overseas or have a parent who was born overseas.

Victoria’s population:



Victorians come from more than 240 countries, speak 234 languages and dialects, and follow 135 religious faiths (Victorian Multicultural Commission, 2018).

A large number of overseas-born Victorians came to Australia as refugees from conflict zones such as (State Government of Victoria, 2016):

- the Second World War in Europe
- Indo-China
- the republics of the former Yugoslavia
- the Horn of Africa
- the Middle East
- Afghanistan.

Please note: Content within this section is reflected in the previous 2017–18 *Your health* report. At the time of writing this report there was no new 2019 data analysis available.

Table 1 shows changes in migration occurring in Victoria. The proportion of people born in England, for example, decreased between the 2011 Census and the 2016 Census. The number of people born in India, China, New Zealand and Vietnam increased over the same period (VMC, 2017).

Table 2 shows the languages spoken at home in Victorian households and the changes that reflect changing patterns of migration. The top five LOTE in 2016 were Mandarin, Italian, Greek, Vietnamese, and Arabic (VMC, 2017).

Figure 2 shows the geographic distribution of the overseas-born population by metropolitan and regional Local Government Areas (LGAs). LGAs in Metropolitan Melbourne's north-east (such as Brimbank and Wyndham) and south-east (Casey, Monash, and Greater Dandenong) have the largest number of overseas-born residents.

For inner city LGAs, the overseas-born population in the City of Melbourne is increasing rapidly. In Regional Victoria, LGAs with significant numbers of overseas-born persons have larger regional urban centres, such as Greater Geelong, Ballarat, Greater Bendigo, Greater Shepparton, Latrobe, and Mildura.

The department has developed and published *Cultural diversity plan 2016–2019* <<https://www.health.vic.gov.au/publications/delivering-for-diversity-cultural-diversity-plan-2016-2019>>. The plan spells out the actions being taken to embed cultural diversity in all policies, practices, and programs, as well as the department's goal to deliver inclusive, safe, and accessible services to all Victorians. These plans build on the department's efforts to improve services for culturally and linguistically diverse communities, including recently arrived migrants, refugees, and asylum seekers.

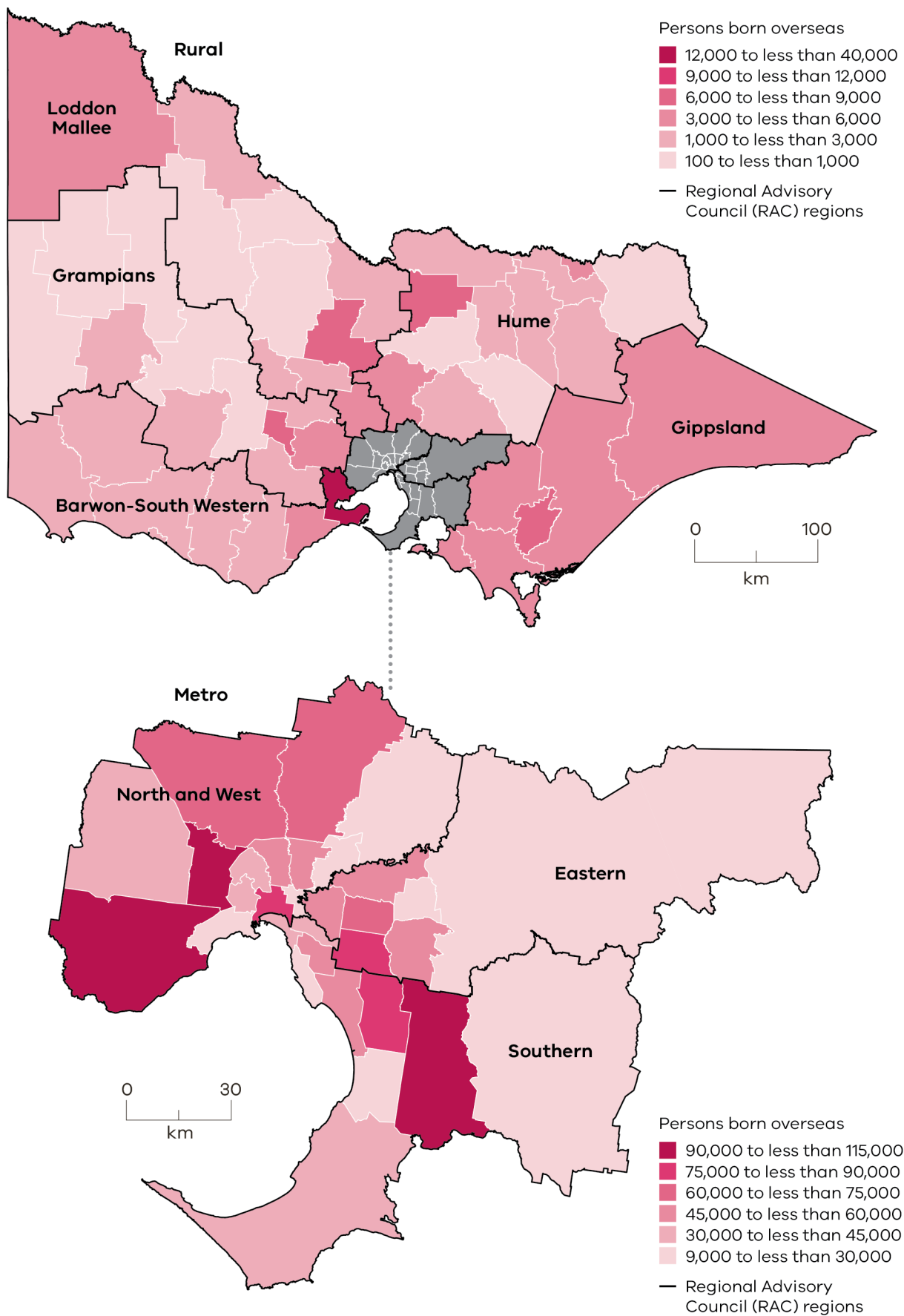
**Table 1. Common countries of birth for Victorians, 2016 and 2011**

Country of birth	Victoria 2016	Per cent	Victoria 2011	Per cent
Australia	3,845,493	64.9	3,670,934	68.6
England	171,443	2.9	172,068	3.2
India	169,802	2.9	111,787	2.1
China (excludes SARs and Taiwan)	160,652	2.7	93,896	1.8
New Zealand	93,253	1.6	80,234	1.5
Vietnam	80,787	1.4	68,296	1.3

**Table 2. Languages spoken at home in Victoria, 2016 and 2011**

Languages, top responses 2016	Victoria 2016	Per cent	Victoria 2011	Per cent
Only English spoken at home	4,026,811	67.9	3,874,861	72.4
Mandarin	191,793	3.2	103,742	1.9
Italian	112,272	1.9	124,856	2.3
Greek	110,707	1.9	116,802	2.2
Vietnamese	103,430	1.7	86,592	1.6
Arabic	79,589	1.3	68,437	1.3
Households where a language other than English (LOTE) language is spoken	624,141	27.8	503,888	25.9

**Figure 2. Metropolitan Melbourne and regional Victoria: number of overseas-born by LGAs, 2016 (DPC, 2017)**



## Low household income

In Victoria, 18.6 per cent of households reported a combined income of less than \$40,000 a year, while 29.4 per cent of households reported a combined income of more than \$100,000 (VAHI, 2019).

Women were more likely to report a household income of less than \$40,000 (20.7 per cent), and less likely to report a household income of more than \$100,000 (26 per cent) compared to men (33 per cent) (VAHI, 2019).

**Table 3. Crude prevalence of household income by gender, Victoria 2019**

Income	Males %	Females %	Total
<20,000	4.7	4.8	4.7
>=20,000 to <40,000	11.8	15.9	13.9
>=40,000 to <60,000	11.4	11.0	11.2
>=60,000 to <80,000	10.3	8.9	9.6
>=80,000 to <100,000	10.1	7.7	8.9
100,000+	33.0	26.1	29.4
Don't know/ Refused to answer	18.6	25.6	22.2

Source: VAHI, *Victorian Population Health Survey 2019*, State of Victoria, Melbourne.

Income and the distribution of money has a significant impact on health. Victorians with a reported total household income less than \$40,000 were more likely to be diagnosed with two or more chronic diseases, more likely to be diagnosed with anxiety or depression, more likely to report high to very high levels of psychological distress, more likely to smoke cigarettes, and more likely to consume alcohol at harmful levels (VAHI, 2021).

## Index of relative socio-economic disadvantage

The Index of Relative Socioeconomic Disadvantage (IRSD) is a general socioeconomic index summarising information about the economic and social conditions of people and households within an area (ABS, 2018b).

Unlike other indexes, the IRSD only includes measures of relative disadvantage (ABS, 2018b).

Each LGA in Victoria can be mapped from most disadvantaged to least disadvantaged. These LGA maps show that rural LGAs are more likely than metropolitan LGAs to be classified as most disadvantaged.

Index of Relative Socioeconomic Disadvantage in Rural and Metropolitan LGAs (ABS, 2016)

Figure 3. Index of Relative Social Disadvantage – rural and regional Victoria

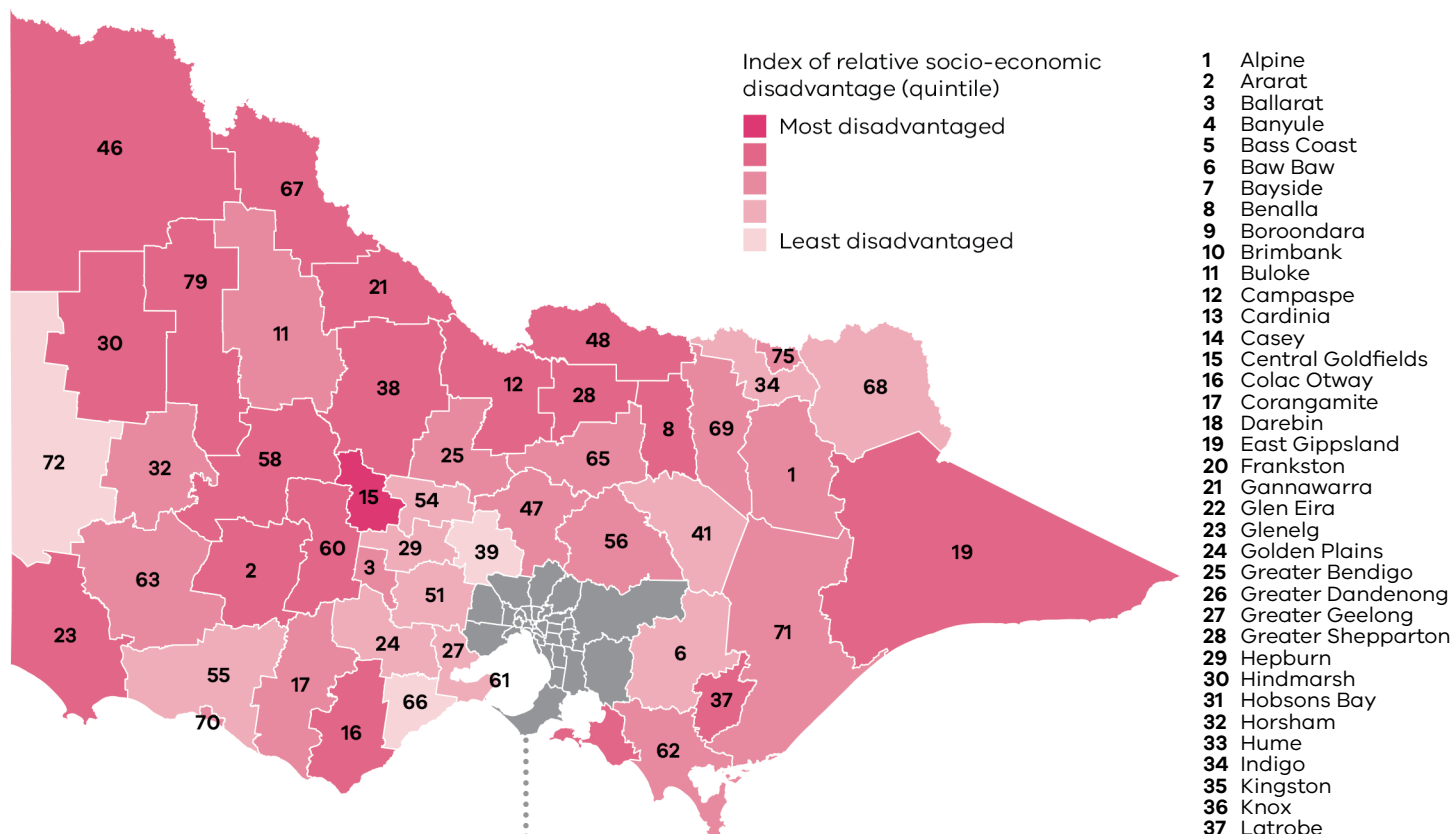
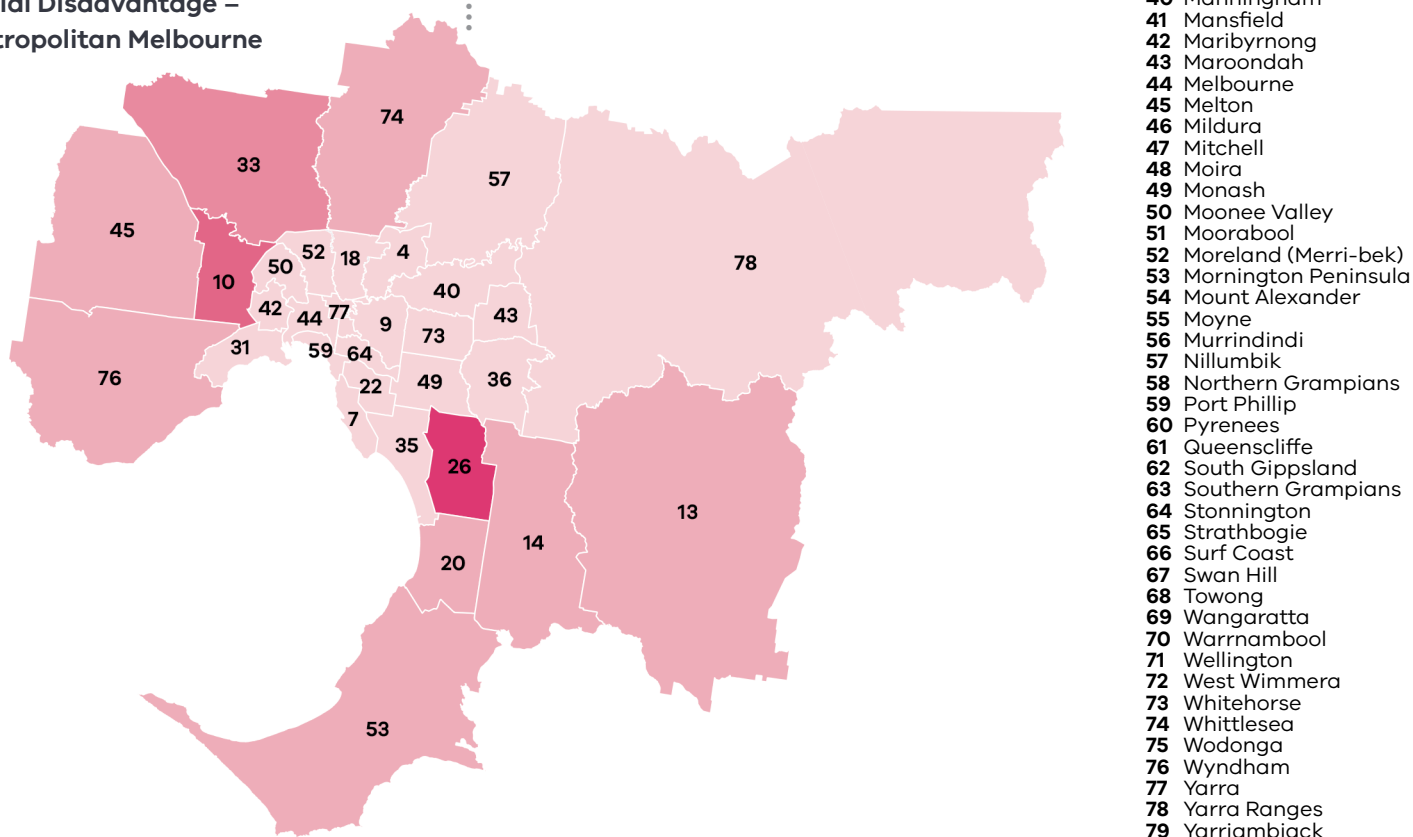


Figure 4. Index of Relative Social Disadvantage – metropolitan Melbourne



Please note: Content within this section is reflected in the previous 2017–18 *Your health* report. At the time of writing this report there was no new 2019 data analysis available.



## References

Australian Bureau of Statistics. 2014. '3238.0 – Estimates and Projections, Aboriginal and Torres Strait Islander Australians, 2001 to 2026'. ABS, Canberra.

Australian Bureau of Statistics 2018b, 'Local government area (LGA) Index of Relative Socio-economic Disadvantage, distribution of statistical area level 1 deciles', 2016, ABS, Canberra.

Australian Bureau of Statistics 2019, '31010 Australian Demographic Statistics', 2019, ABS, Canberra (viewed 11 October 2022) <<https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/31010Mar%202019?OpenDocument>>

Australian Bureau of Statistics 2017 'Population Projections', Australia, ABS, Canberra (viewed 11 October 2022) <<https://www.abs.gov.au/statistics/people/population/population-projections-australia/latest-release>>.

Australian Bureau of Statistics 2018–19, 'Regional population', ABS, (viewed 11 October 2022) <<https://www.abs.gov.au/statistics/people/population/regional-population/2018-19>>.

Australian Bureau of Statistics 2019, '2071.0 – Census of Population and Housing: Reflecting Australia – Stories from the Census, 2016', ABS, Canberra.

Australian Bureau of Statistics 2019a, 'Regional population by age and sex', ABS, Canberra, (viewed 12 October 2022) <<https://www.abs.gov.au/statistics/people/population/regional-population-age-and-sex/2019>>.

Australian Bureau of Statistics 2018–2020, 'Life tables', ABS, Canberra (viewed 12 October 2022) <<https://www.abs.gov.au/statistics/people/population/life-tables/latest-release>>.

Australian Institute of Health and Welfare 2018, 'Survey of Health Care: selected findings for rural and remote Australians', AIHW, Australian Government, (viewed 02 August 2022).

Department of Health and Human Services 2019, 'Cultural Determinants of Health Literature Review KKBD'.

Department of Land, Water and Planning 2020, 'Population and Housing in Regional Victoria 2019', The State of Victoria Department of Environment, Land, Water and Planning 2020, Melbourne.

State Government of Victoria. (2016). Discover Victoria's diverse population. Available at: <<https://www.vic.gov.au/discover-victorias-diverse-population>>.

Indigenous House of Learning, Self-Determination: Background Concepts; Scoping paper 1. Available at: <<https://content.health.vic.gov.au/sites/default/files/migrated/files/collections/research-and-reports/s/self-determination-scoping-paper.pdf>>.

Victorian Agency for Health Information 2021, 'Victorian Population Health Survey 2019: summary of results', State of Victoria, Melbourne.

Victorian Government, Victorian Government Aboriginal Affairs Report 2019. Available at: <<https://www.firstpeoplesrelations.vic.gov.au/victorian-government-aboriginal-affairs-report-2019>>.

Victorian Multicultural Commission Annual Report 2019–20 (n.d.). [online]. Available at: <[https://www.multiculturalcommission.vic.gov.au/sites/default/files/2021-10/Victorian-Multicultural-Commission-2019-20-Annual-Report\\_1.pdf](https://www.multiculturalcommission.vic.gov.au/sites/default/files/2021-10/Victorian-Multicultural-Commission-2019-20-Annual-Report_1.pdf)> (viewed 12 October 2022).



# Chapter 7 – Health inequalities

The Victorian Health Promotion Foundation (VicHealth) has been a pioneer in health promotion since 1987. It's *VicHealth Health Equity Strategy 2017–2019 – Fair Foundations: The VicHealth framework for health equity* <<https://www.vichealth.vic.gov.au/-/media/ResourceCentre/PublicationsandResources/Health-Inequalities/The-VicHealth-Health-Equity-Strategy-2017-19.pdf?la=en&hash=DE7A49041CDF9AA2E0E6524A3E80A45F29182524>> – describes the distinction between health inequalities and health inequities.

According to VicHealth:

- Health inequalities are differences in health status between population groups.
- Health inequities are differences in health status between population groups that are socially produced, systematic in their unequal distribution across the population, avoidable, and unfair (VicHealth, 2015 <<https://www.vichealth.vic.gov.au/media-and-resources/publications/the-vichealth-framework-for-health-equity>>).

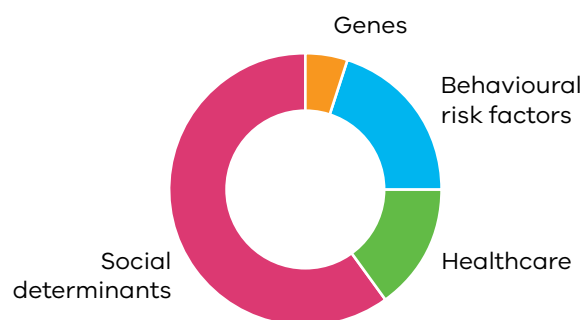
Climate change is exacerbating existing inequalities through the greater exposure and vulnerability of priority groups to climate hazards and the disproportionate loss of assets and incomes experienced by these groups (Nazrul Islam and Winkel 2017).

## Determinants of health

Health is determined by a complex interaction between genetic inheritance, behavioural risk factors (also known as health behaviours or lifestyle risk factors), access to quality and affordable healthcare, and the social determinants of health (Tarlov, 1990).

Figure 1 shows the relative contribution of these determinants to health according to Tarlov (1999).

**Figure 1. Determinants of health – modified from Tarlov, 1999**



It is the social determinants that make the largest impact on health, followed in descending order by behavioural risk factors, access to quality healthcare, and genetic inheritance.

## The social determinants of health

The World Health Organization (WHO) defines the social determinants of health as: 'The conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life' – including the distribution of money, power, and resources (WHO, 2008).

The WHO report recognises 10 social determinants of health: the social gradient (socioeconomic status), stress, early life, social exclusion, work, unemployment, social support, addiction, food, and transport.

Although social determinants make the greatest contribution to health, public health practice among high-income countries continues to place the primary focus on the behaviours of individuals that pose a risk to health – or behavioural risk factors (Baum, 2011). This approach may be partly due to the domination of the biomedical model of health in guiding modern clinical medicine and epidemiology (Ansari et al, 2003). The biomedical model of health attributes disease to proximate biological factors at the individual level, and largely ignores the psychological, social, cultural, economic, and environmental causes of ill-health (Johnson, 2013).

The policy and intervention implications of the biomedical model are that chronic diseases can be prevented through the adoption of healthy behavioural choices. This approach avoids social determinants of disease by inferring disease in populations can be fully explained by risk factors for disease in individuals (Shy, 1997).

Current evidence suggests that the gains to be made by addressing behavioural risk factors are less than the gains to be made by addressing the social determinants of health (Tarlov, 1999) (Braveman et al, 2011). For example, a risk-factor analysis found that 29 risk factors (of which 27 were behavioural) accounted for only 31.5 per cent of the total burden of disease and injury in Australia in 2011 (AIHW, 2016).

The focus on behavioural risk factors is predicated on the assumption that all individuals in a society are equally free and able to choose a healthy lifestyle. Therefore, individuals who engage in unhealthy behaviours are seen to be people engaging in irresponsible behaviour who need to be held to account for their own ill-health (Brown 2013). This narrow approach stigmatises people who engage in unhealthy behaviours and shifts the focus of responsibility for public health away from the government and private sector onto the private individual (Baum, 2011) (Baum and Fisher, 2011).

This individualised approach doesn't take into account, for instance, that an individual may consume a nutritionally poor, obesogenic diet out of necessity rather than choice because they lack the economic resources to purchase more expensive healthier dietary options. Likewise, people may smoke or take recreational drugs to cope with stressful and disadvantaged circumstances (Baum, 2011). The focus on behavioural risk factors entrenches and exacerbates health inequalities because people higher up the socioeconomic ladder have less stressful lives, more resources, and greater motivation to alter their behaviour (Baum and Fisher, 2011).

Despite the vast amount of published literature in health promotion, there is little supporting evidence that health promotion interventions designed to promote behavioural change in individuals work. A Cochrane systematic review, which evaluated the effectiveness of interventions to reduce behavioural risk factors, concluded that the balance of evidence showed that health promotion interventions had limited success, but the often modest improvements are not sustained in the long-term (Ebrahim et al, 2011). The Cochrane review reinforces the importance of community-wide, structural influences on health, such as green space for exercise, access to affordable fresh healthy food, factors to reduce workplace and/or financial stress, and a reduction in family and other forms of violence.

In 2019, the proportions of adults in Victoria who had been diagnosed by a doctor with two or more chronic diseases were significantly more likely to:

- rent (35.2 per cent) than own their own home (24.5 per cent)
- have not completed high school (33.9 per cent) than attended university (23.5 per cent)
- be unemployed (33.7 per cent) than employed (23.2 per cent)
- have a total annual household income of less than \$40,000 (36.8 per cent) than a household income of \$100,000 or more (21.2 per cent)
- be Aboriginal (43.2 per cent) than non-Aboriginal (27.4 per cent).

## Aboriginal and Torres Strait Islander peoples in Victoria

Aboriginal people and communities in Victoria are strong and rich in culture, but they experience higher rates of ill-health than non-Aboriginal Victorians. Evidence indicates that these higher rates of ill-health are linked to contemporary experiences of racism, socioeconomic disadvantage and social exclusion in society, as well as the ongoing impacts and legacy of intergenerational trauma and colonisation, including disconnection from Country, culture, family and spirituality (The Family Matters Report, 2020).

Climate change may compound the health inequities already experienced by Aboriginal Victorians (Nursesey-Bray et al, 2019). Moreover, climate change impacts on Country also impact the cultural determinants of Aboriginal health and wellbeing (Nursesey-Bray et al, 2019, National Environmental Science Program Earth Systems and Climate Change Hub 2021). Conversely, Aboriginal and Torres Strait Islander peoples have been actively Caring for Country and observing and adapting to changing environments for millennia (Nursesey-Bray et al, 2019, Ford et al, 2020).

Aboriginal self-determination and connection to culture, Country and community, improve health and wellbeing. Self-determination also underpins the resilience of Aboriginal Victorians to climate change (DHHS, 2017, Ford et al, 2020).

To achieve optimal Aboriginal health and wellbeing outcomes, Victoria's health system must recognise the strength of culture and deliver holistic health and wellbeing services that are culturally safe and free from racial discrimination.

Key data on Aboriginal Victorians' health, wellbeing and safety includes (Victorian Government Aboriginal Affairs Report, 2019):

### Overall health and wellbeing

- The overall life expectancy of Aboriginal people is improving, but a seven-year gap remains between Aboriginal and non-Aboriginal Victorians.
- The rate of Aboriginal people living in Victoria who rate their own health as 'excellent' or 'very good' is 36.9 per cent.



**Life expectancy of Aboriginal Victorians** is approximately **7 years less** than non-Aboriginal Victorians

## Chronic disease

- The incidence rate for cancer is higher for Aboriginal people than non-Aboriginal people, at 57.7 per 10,000 for men and 49.9 per 10,000 for women, compared with 34.7 and 28.6 per 10,000.
- Rates of smoking continue their long-term downward trend, but are still high (39.8 per cent in 2014–15 compared to 47 per cent in 2004–05). A similar decrease in smoking rates was recorded among young Aboriginal people aged 15 to 24, with 56.1 per cent reporting they had never smoked in 2014–15 compared to 44.3 per cent in 2002.
- Rates of severe psychological distress increased by 4.3 per cent between 2011–13 and 2014–15 (from 31.5 to 35.8 per cent), while self-harm related emergency presentations increased from 5.3 per 1,000 to 7.5 per 1,000 (2008–9 and 2017–18).

## Service use and accessibility

- More Aboriginal Victorians of all ages received health checks or assessments in 2019–20 than in 2008–09. More than three times as many Aboriginal Victorians aged 15 to 54 years received health checks or assessments in 2019–20 than did in 2008–09, with almost six times the number of adults aged over 55, and more than six times the number of children aged 0 to 14 years, receiving checks or assessments. (Victorian Government Aboriginal Affairs Report, 2021).
- Disability services were made available to 45.5 per cent of Aboriginal people in Victoria as participants in the National Disability Insurance Scheme (3,483 identified as participants).
- Aboriginal Elders and older people accessed aged care services at a rate of 7.6 per cent during the 2017–18 period.
- LGBTIQ+ services accessed by Aboriginal people were provided via programs such as Nanyubak Yapaneyeputi: Dreaming together retreat, with 60 participants attending.
- The number of Aboriginal people employed in the health or social services sector almost doubled between 2006 and 2016.

## Find out more

Find out more about Aboriginal and Torres Strait Islander health inequalities in 'Chapter 9 – Healthy living' and 'Chapter 10 – Maternal and infant health'.

## Aboriginal self-determination

This is a significant time for Aboriginal communities in Victoria. Since 2015, the Victorian Government has committed to Aboriginal self-determination as the guiding principle and policy for Aboriginal affairs and adopted a vision that 'all Aboriginal Victorian people, families and communities are healthy, safe, resilient, thriving and living culturally rich lives' (*Victorian Aboriginal Affairs Framework 2018–2023*).

The department has committed to improving Aboriginal cultural safety and advancing self-determination through multiple frameworks and plans, including:

- *Korin Korin Balit-Djak* – Aboriginal health, wellbeing and safety strategic plan 2017–2027
- *Balit Murrup* – social and emotional wellbeing framework 2017–2027
- the department's Aboriginal and Torres Strait Islander Cultural Safety Framework
- Victoria's implementation of the Closing the Gap Jurisdictional Implementation Plan
- targets committed under the Victorian Aboriginal Affairs Framework (VAAF) 2018–2023.

The VAAF is the Victorian Government's framework for working with Aboriginal Victorians, organisations and the wider community to drive action and improve outcomes.

The VAAF is guided by the following Aboriginal self-determination enablers:

1. Prioritise culture.
2. Address trauma and support healing.
3. Address racism and promote cultural safety.
4. Transfer power and resources to communities.

## Rural and regional Victorians

In 2019, there were no statistically significant differences in the proportions of rural or metropolitan dwelling Victorian adults who smoked or met the national guidelines for alcohol consumption, fruit and vegetable consumption, and physical activity (VAHI, 2021). In contrast, 24.6 per cent (95 per cent confidence interval (CI): 22.1–27.2 per cent) of adults living in rural Victoria were obese compared with 19.1 per cent (95 per cent CI: 17.6–20.7 per cent) of adults living in metropolitan Victoria.

There were also no statistically significant differences in the proportions of adults who had ever been told by a doctor that they had asthma, arthritis, cancer, heart disease, osteoporosis, type 2 diabetes, or stroke. Similarly, there were no statistically significant differences in the proportions of adults who reported high or very high psychological distress or had ever been told by a doctor that they had depression or anxiety. Overall, adults who lived in rural Victoria reported similar levels of health as adults who lived in metropolitan Victoria.

## Refugees, asylum seekers, and displaced persons

Globally, climate change is contributing to displacement and making life harder for those already forced to flee. The 1951 Refugee Convention offers protection to people fleeing war and conflict who face persecution on grounds of race, religion, nationality, membership in a particular social group or political opinion (UNHCR, 1951). However, people who leave their countries because of climate change or disasters do not currently qualify for protection under international law. The impacts of climate change may both trigger displacement and worsen living conditions or hamper return for those who have already been displaced (United Nations Refugee Agency, 2019).

Victoria has a proud history of successfully settling humanitarian entrants and providing responsive and needs-based services to support new arrivals to settle into our thriving multicultural state. Victoria is typically the largest recipient of refugees in Australia, welcoming an average of around 4,000 refugees a year.

While many refugees arrive in Australia as part of the offshore humanitarian program on permanent visas, a number of refugees and people seeking asylum reside for extended periods of time in the community on temporary visas.

### Refugees and asylum seekers face more complex health needs

Refugees and people seeking asylum live with greater social and economic disadvantage and are more likely to experience health inequalities related to climate caused displacement (Victorian Government, 2019).

People seeking asylum are one of the most vulnerable and disadvantaged groups in the Victorian community. Almost 60 per cent of asylum seekers in Australia have been close to death, 59 per cent have been forcibly separated from family, and more than half live with post-traumatic stress disorder (PTSD) or major depressive disorder (DHHS, 2019).

Nearly **60%** of Australia's **asylum seekers** have been close to death and/or forcibly removed from family.

More than **half** live with **PTSD** as a result.



In addition, people on temporary visas can experience the mental health impacts of:

- prolonged uncertainty
- indefinite separation from family in precarious circumstances
- barriers to accessing services due to their visa, Medicare, or income status.

It is estimated that 6,000 people could be reliant on Victorian Government support to meet their basic health and wellbeing needs. These asylum seekers include families and people with complex physical and mental health needs who have no income or savings.

### Health supports for asylum seekers and refugees

The Victorian Government is committed to facilitating a safe, welcoming, and inclusive society, in which services and support are universally accessible, regardless of visa status.

In Victoria, all refugees and people seeking asylum can access state-funded healthcare as admitted, non-admitted or emergency patients, regardless of their visa or Medicare status.

The Victorian Government committed \$3 million in 2019–20 to address rising asylum seeker destitution and vulnerability. The funds were to boost the capacity of specialist asylum seeker programs to deliver crisis support and engage Victorian Government services in the immediate and longer-term response.

Victoria will provide people seeking asylum with primary health care, mental health support, case coordination, and assistance for employment pathways, legal assistance, and basic needs.

### Find out more

Find out more about *Refugee and asylum seeker health and wellbeing* <<https://www.health.vic.gov.au/populations/refugee-and-asylum-seeker-health-and-wellbeing>>.

## Sex and gender inequalities in health

While there are no universally accepted definitions of sex and gender, they are different and should not be used interchangeably.

The WHO has defined these concepts:

- Sex 'refers to the different biological and physiological characteristics of females, males and intersex persons, such as chromosomes, hormones and reproductive organs'.
- 'Gender refers to the characteristics of women, men, girls, and boys that are socially constructed. This includes norms, behaviours and roles associated with being a woman, man, girl, or boy, as well as relationships with each other. As a social construct, gender varies from society to society and can change over time' (WHO, 2022).

Sex and gender interact with each other. They also interact with age, socio-economic status, religion, ethnicity and other social and economic determinants of health. This interaction is known as intersectionality.

There is ample evidence that risk of developing certain diseases, the way people present with disease, how well people respond to treatments, and people's health seeking behaviour, are all influenced by either sex or gender or both sex and gender.

That is because there are conditions unique to females, such as peripartum cardiomyopathy, as well as chronic illnesses that have different prevalence rates in different sexes. For example, overall, cancer is more prevalent among males, who also have a higher mortality than females. However, although there are common risk factors for developing chronic conditions, such as obesity, the incidence of heart failure is higher among women who are obese than men who are obese (Mauvais-Jarvis, 2020).



Some climate-related health impacts also differ between genders. For example, male suicide rates have been found to increase faster with increasing temperatures, and mortality from heatwaves is higher in women (Beggs et al, 2019; Malone, 2009). Women are also disproportionately impacted by climate change in emergency and disaster situations, such as through increases in violence against women following bushfires (Parkinson, 2011 and 2019). These situations also place pressure on people to conform to gender stereotypes and can exacerbate existing gender inequalities – resulting in unequal health, social, and economic outcomes for people of all genders (Tyler and Fairbrother, 2013).

Despite fundamental differences within and between the sexes, research is often conducted in males only, but findings are generalised to females. Clinical guidelines are not sex-specific, for example, in relation to preventing type 2 diabetes in women who have had gestational diabetes.

A lack of due consideration to sex and gender in health research, policy and practice, can contribute to lower standards of care, an increased likelihood of adverse health events, and higher health costs.

In partnership with the Victorian Agency for Health Information and Safer Care Victoria, the department is embedding the inclusion of sex and gender in study design, data collection, analysis and interpretation as part of quality-improvement initiatives.

### **Snapshot of sex and gender differences in health conditions and outcomes**

- The reference range of the diagnostic blood test for heart attack (serum troponin) favours male biology, which means that many women experience a delayed diagnosis or a misdiagnosis.
- Women often underestimate their risk of myocardial infarction compared with men and seek consultation later than men.

- With the onset of menopause, the risk of cardiovascular disease, breast cancer, and osteoporosis increases significantly.
- Orthopaedic devices are designed based on the anatomy of men, which contributes to higher complications and higher avoidable costs of care for women.
- Autoimmune diseases affect approximately 8 per cent of the global population, but close to 80 per cent of those impacted are women.

## **Lesbian, gay, bisexual, trans and gender diverse, intersex, queer and/or questioning (LGBTIQ+) Victorians**

### **How many people identify as LGBTIQ+?**

The proportion of lesbian, gay, bisexual, trans and gender diverse, intersex, queer and/or questioning (LGBTIQ+) people living in Victoria is difficult to accurately estimate.

Based on current available research from Australia and overseas, people who identify as lesbian, gay or bisexual account for 3–4 per cent of the general population and 4–7 per cent of the population aged under 25 (Carman et al, 2020a; Wilson and Shalley, 2018). When this question is framed around experiences of same-gender attraction and behaviour, rather than identity the figure rises as high as 9 per cent per cent for men and 19 per cent for women (Richters et al, 2014). Other studies have found that 1 per cent of people identify as trans and gender diverse (Carman et al, 2020a), and 1.7 per cent of people are born with some kind of intersex variation (Blackless et al, 2000).

Work to improve the availability and quality of the data is underway. This work will enable better estimates of the number of LGBTIQ+ people living in Victoria and assist in developing targeted programs and initiatives to promote their health and wellbeing.

## Health outcomes for LGBTIQ+ people

Many LGBTIQ+ people live happy, healthy and connected lives, but many also face discrimination and poor health and wellbeing outcomes.

LGBTIQ+ Australians have been found to experience lower overall life satisfaction, and worse physical and mental health outcomes (Perales, 2019). Many studies have shown that LGBTIQ+ people have poorer health outcomes in areas such as anxiety, depression, suicide and self-harm, alcohol and drug use, HIV and sexually transmitted infection (STI) prevalence, obesity, risk for some cancers, asthma and cardiovascular disease (Carman et al, 2020b). This issue is particularly important for trans and gender diverse people, with 25 per cent of young trans Australians having been diagnosed with post-traumatic stress disorder (PTSD) at some point in their lives (Strauss et al, 2017).

Experiences of discrimination contribute to poor health and wellbeing outcomes. In Australia, 61 per cent of LGBTIQ+ young people have reported experiencing homophobic verbal abuse, 18 per cent have reported experiencing homophobic physical abuse, and 24 per cent have experienced verbal and physical abuse in their family home (Hillier et al, 2010).

## Health supports for LGBTIQ+ Victorians

The Victorian Government is committed to ensuring all Victorians have safe, healthy, happy lives, and LGBTIQ+ Victorians fully participate in the state's economic, educational, political, community, and social life.

The Victorian Government has delivered programs and initiatives to support LGBTIQ+ Victorians to live healthy lives (DHHS, 2019; Department of Treasury and Finance, 2019).

These programs and initiatives include:

- funding for homelessness providers to ensure young LGBTIQ+ Victorians can access safe and inclusive services across the entire homelessness sector

- extended funding for mental health support and family counselling services
- increased support for services for victims of conversion therapy
- expanded capacity to support and better meet the needs of trans- and gender-diverse Victorians, through the creation of two multidisciplinary clinics and a targeted, state-wide health professional training program focused on inclusive and responsive healthcare
- pursuing Rainbow Tick accreditation across all family violence services to provide additional support to LGBTIQ+ victim survivors.

## Find out more

Find out more about the [health and wellbeing of lesbian, gay, bisexual, trans and gender diverse, intersex and queer people](https://www.health.vic.gov.au/populations/understanding-lgbtiq-health) <<https://www.health.vic.gov.au/populations/understanding-lgbtiq-health>>.

## References

- American Heart Association, 2021, 'Obesity and Cardiovascular Disease: A Scientific Statement from the American Heart Association', *Circulation*, vol. 143, no. 21, pp. e984–e1010, <<https://doi.org/10.1161/CIR.0000000000000973>>.
- Ansari, Z., N. J. Carson, M. J. Ackland, L. Vaughan and A. Serraglio 2003. 'A public health model of the social determinants of health' *Sozial- und Praventivmedizin* 48(4): 242–51.
- Australian Institute of Health and Welfare 2016. 'Australian Burden of Disease Study: Impact and causes of illness and death in Aboriginal and Torres Strait Islander people 2011.' Australian Burden of Disease Study series no. 6. Cat. no. BOD 7. AIHW. Canberra.
- Baum, F. 2011, 'From Norm to Eric: avoiding lifestyle drift in Australian health policy', *Australian and New Zealand Journal of Public Health* 35(5): 404–6.

Baum, F. and M. Fisher 2011, 'Are the national preventive health initiatives likely to reduce health inequities?' *Australian Journal of Primary Health* 17(4): 320–6.

Beggs PJ, Zhang Y, Bambrick H, Berry HL, Linnenluecke MK, Trueck S, et al. 2019, 'The 2019 report of the MJA– Lancet Countdown on health and climate change: a turbulent year with mixed progress', *Medical Journal of Australia*. 211(11):490–1. e21.

Blackless, M, Charuvastra, A, Derryck, A, Fausto-Sterling, A, Lauzanne, K & Lee, E 2000, 'How sexually dimorphic are we? Review and synthesis', *American Journal of Human Biology*, vol. 12, no. 2, pp. 151–166.

Braveman, P., S. Egerter and D. R. Williams 2011, 'The social determinants of health: coming of age' *Annual Review of Public Health* 32: 381–98.

Brown, R. C. H. 2013, 'Moral responsibility for (un) healthy behaviour.' *Journal of Medical Ethics* 39: 695–8.

Burrowes K. 2021, 'Gender bias in medicine and medical research is still putting women's health at risk', *The Conversation*, 10 March 2021, <<https://theconversation.com/gender-bias-in-medicine-and-medical-research-is-still-putting-womens-health-at-risk-156495>>.

Carman, M, Farrugia, C, Bourne, A, Power, J & Rosenberg, S 2020a, *Research Matters: How many people are LGBTIQ?*, Rainbow Health Victoria, Melbourne.

Carman, M, Rosenberg, S, Bourne, A & Parsons, M 2020b, *Research Matters: Why do we need LGBTIQ-inclusive services?*, Rainbow Health Victoria, Melbourne.

Department of Health and Human Services 2017, Balit Murrup: Aboriginal social emotional wellbeing framework 2017–2027. Available at: <<https://www.dhhs.vic.gov.au/sites/default/files/documents/201710/Balit-Murrup-Aboriginal-social-and-emotional-wellbeing-framework-2017-2027.pdf>>.

Department of Health and Human Services 2017, Korin Korin Balit-Djak: Aboriginal health, wellbeing and safety strategic plan 2017–2027. Available at: <<https://www.health.vic.gov.au/health-strategies/korin-korin-balit-djak-aboriginal-health-wellbeing-and-safety-strategic-plan-2017>>.

Department of Health and Human Services 2019, State Government of Victoria, Melbourne, Trans and gender diverse health and wellbeing (viewed 07 October 2022), <<https://www.health.vic.gov.au/populations/trans-and-gender-diverse-health-and-wellbeing>>.

Department of Health and Human Services 2022, Refugee and asylum seeker health and wellbeing. [online] Available at: <<https://www.health.vic.gov.au/sites/default/files/migrated/files/collections/factsheets/s/stepping-in-to-support-people-seeking-asylum---factsheet.docx>> (viewed 6 October 2022).

Department of Treasury and Finance, 2019, 'Budget Paper No. 3: Service Delivery', 2019–20 *State Budget*, State Government of Victoria, Melbourne.

Ebrahim, S., F. Taylor, K. Ward, A. Beswick, M. Burke and G. Davey Smith 2011, 'Multiple risk factor interventions for primary prevention of coronary heart disease' *Cochrane Database Syst Rev* (1): CD001561.

Family Matters, 2020, The Family Matters report 2020. Available at: <[https://www.familymatters.org.au/wp-content/uploads/2020/11/FamilyMattersReport2020\\_LR.pdf](https://www.familymatters.org.au/wp-content/uploads/2020/11/FamilyMattersReport2020_LR.pdf)>.

Ford JD, King N, Galappaththi EK, Pearce T, McDowell G, Harper SL, 2020 'The Resilience of Indigenous Peoples to Environmental Change', *One Earth*, Vol. 2, Issue 6, pp. 532–543.

Hillier, L, Jones, T, Monagle, M, Overton, N, Gahan, L, Blackman, J, & Mitchell, A 2010, *Writing themselves in 3: the third national study on the sexual health and wellbeing of same sex attracted and gender questioning young people*, Australian Research Centre in Sex, Health and Society, La Trobe University, Melbourne.

- Hutchinson K. 2019, 'Why women are more likely to have dodgy hip implants or other medical devices', *The Conversation*, 12 August 2021, <<https://theconversation.com/why-women-are-more-likely-to-have-dodgy-hip-implants-or-other-medical-devices-121363>>.
- Johnson, S. 2013, 'Increasing psychology's role in health research and health care' *American Psychologist* 68(5): 311321.
- Kawachi, I., Subramanian, S.V & Almeida-Filho, N. 2002, A glossary for health inequalities. *Journal of Epidemiology and Community Health* 56 (9): 647–52.
- Malone E. 2009, 'Vulnerability and resilience in the face of climate change: current research and needs for population information'. Population Action International: Washington, DC.
- Mauvais-Jarvis et al. 2020, 'Sex and gender: Modifiers of health, disease, and medicine', *Lancet*, vol. 396, pp. 565–82.
- National Environmental Science Program Earth Systems and Climate Change Hub 2021, 'National First Peoples Gathering on Climate Change: Summary Fact Sheet' National Environmental Science Program, Earth System and Climate Change Hub, Melbourne.
- Nazrul Islam, S. and Winkel, J. 2017 'Climate change and social inequality', Department of Economics and Social Affairs working paper no. 152. United Nations.
- Nurse-Bray M, Palmer R, Smith TF, Rist P 2019. 'Old ways for new days: Australian Indigenous peoples and climate change', *Local Environment*, Vol. 24, No. 5, pp. 473–486.
- Parkinson D. 2011, 'The way he tells it: relationships after Black Saturday'. Vol. 1 Executive summary and recommendations. Wangaratta, Victoria: Women's Health Goulburn North East. Available from: <<https://www.genderanddisaster.com.au/info-hub/research-resources/>>.
- Parkinson D. 2019, 'Investigating the increase in domestic violence post disaster: an Australian case study'. *Journal of Interpersonal Violence*, 34(11):2333–62.
- Perales, F 2019, 'The health and wellbeing of Australian lesbian, gay and bisexual people: a systematic assessment using a longitudinal national sample', *Australian and New Zealand Journal of Public Health*, vol. 43, no. 3, pp. 281–287.
- Richters, J, Altman, D, Badcock, P, Smith A, de Visser R, Grulich A, Rissel C, & Simpson J 2014 'Sexual identity, sexual attraction and sexual experience: the Second Australian Study of Health and Relationships', *Sexual Health*, vol. 11, no. 5, pp. 451–460.
- Refugees, U.N.H.C. for (n.d.). *Climate change and disaster displacement in the Global Compact on Refugees*. [online] UNHCR. Available at: <<https://www.unhcr.org/en-au/protection/environment/5c9e13297/climate-change-disaster-displacement-global-compact-refugees.html>> (viewed 6 October 2022).
- Shy, C. M. 1997, 'The failure of academic epidemiology: witness for the prosecution' *American Journal of Epidemiology* 145(6): 479–84.
- Strauss, P, Cook, A, Winter, S, Watson, V, Wright Toussaint, D & Lin, A 2017, *Trans Pathways: the mental health experiences and care pathways of trans young people*, Telethon Kids Institute, Perth.
- Tarlov, A. R. 1999, 'Public policy frameworks for improving population health' *Annals of the New York Academy of Science* 896: 281–93.
- Tyler, M & Fairbrother, P, 2013, 'Gender, masculinity and bushfire: Australia in an international context', *Australian Journal of Emergency Management*, vol. 28, no. 2, pp. 20–25.
- VicHealth 2015 'Fair Foundations: The VicHealth framework for health equity'. Victoria, Melbourne <<http://www.vichealth.vic.gov.au/media-and-resources/publications/the-vichealth-framework-for-health-equity>>.

Victorian Agency for Health Information 2021, 'Victorian Population Health Survey 2019: summary of results', State of Victoria, Melbourne.

Victorian Government, Victorian Government Aboriginal Affairs Report 2019. Available at: <<https://www.firstpeoplesrelations.vic.gov.au/victorian-government-aboriginal-affairs-report-2019>>.

Victorian Government, Victorian Government Aboriginal Affairs Report 2021 <<https://www.firstpeoplesrelations.vic.gov.au/victorian-government-aboriginal-affairs-report-2021/health-and-wellbeing>>.

Victorian Government. (2019). Victorian public health and wellbeing plan 2019–2023. Available at: <<https://www.health.vic.gov.au/publications/victorian-public-health-and-wellbeing-plan-2019-2023>>

Wilson, T & Shalley, F 2018, 'Estimates of Australia's non-heterosexual population', *Australian Population Studies*, vol. 2, no. 1, pp. 26–38.

World Health Organization 2008 'Closing the gap in a generation: health equity through action on the social determinants of health'. Final report of the Commission on the Social Determinants of Health Geneva, World Health Organization.

World Health Organization, 2022 Gender. Available at: <[https://www.who.int/europe/health-topics/gender#tab=tab\\_1](https://www.who.int/europe/health-topics/gender#tab=tab_1)>.



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# Chapter 8 – Burden of disease

Burden of disease is an indication of the impact of living with illness and injury and dying prematurely. It is measured using disability-adjusted life years (DALY), which is the number of years of healthy life lost due to death and illness (AIHW, 2018).

In Australia, burden of disease is measured for more than 200 diseases and injuries (grouped into 17 disease groups). In addition, the burden of disease takes into account modifiable risk factors to disease burden, age at death and severity of disease to estimate the total health loss (AIHW, 2018).

A large proportion of the disease burden can be prevented, and their impacts reduced or avoided, by individuals making healthier lifestyle choices.

This section gives an overview of the disease groups that have a major impact on Australians.

It draws on:

- leading causes of disease and injury
- causes of death in Victoria
- overweight and obesity
- alcohol use
- smoking and vaping.

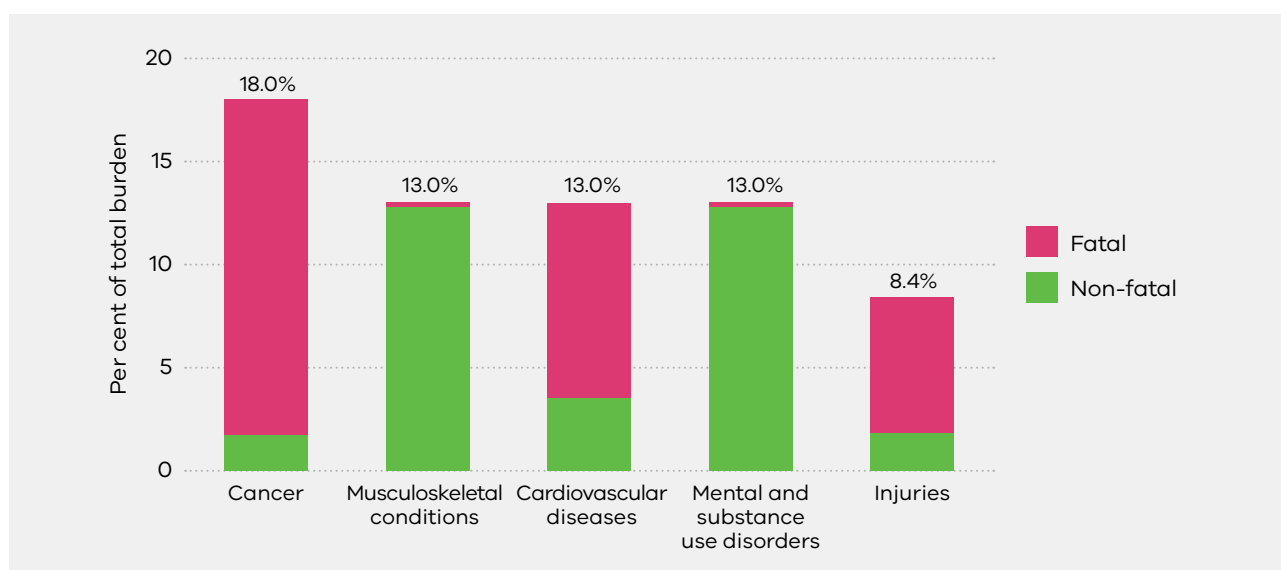
Please note: Some content within this chapter is reflected in the previous 2017–18 *Your health* report. At the time of writing this report there was no new 2019 data analysis available.

## Leading causes of disease and injury

In Australia, most of the total burden of disease in 2018 was from chronic diseases and injury (AIHW, 2021).

Figure 1 shows the proportion (per cent) of total burden, and fatal and non-fatal composition of total burden, for the five leading disease groups in 2018.

**Figure 1. Proportion (%) of total burden, and fatal and non-fatal composition of total burden, for the five leading disease groups in 2018**



## Some population groups face a greater burden than others

There is considerable variation in deaths and years of life lost across population groups.

People in remote areas face a burden 1.4 times higher than those in major cities.

People in low socioeconomic groups face a burden 1.6 times higher than those in the highest socioeconomic groups (AIHW, 2021).

In 2018, Aboriginal Australians experienced twice the rate of disease burden compared with non-Aboriginal Australians. This rate ratio has remained stable between 2013–2018 (AIHW, 2021).

## Modifiable risk factors

More than a third of Australia's disease burden is preventable.

In 2018, 38 per cent of the burden of disease could have been prevented by reducing or avoiding the exposure to the modifiable risk factors examined in this study. The risk factors contributing to the greatest burden were smoking (8.6 per cent), overweight and obesity (8.4 per cent), dietary risk factors (5.4 per cent), high blood pressure (5.1 per cent), and alcohol use (4.5 per cent).

Tobacco use remains the leading risk factor causing burden, the gap between tobacco use and overweight (including obesity) has almost closed (AIHW, 2021).

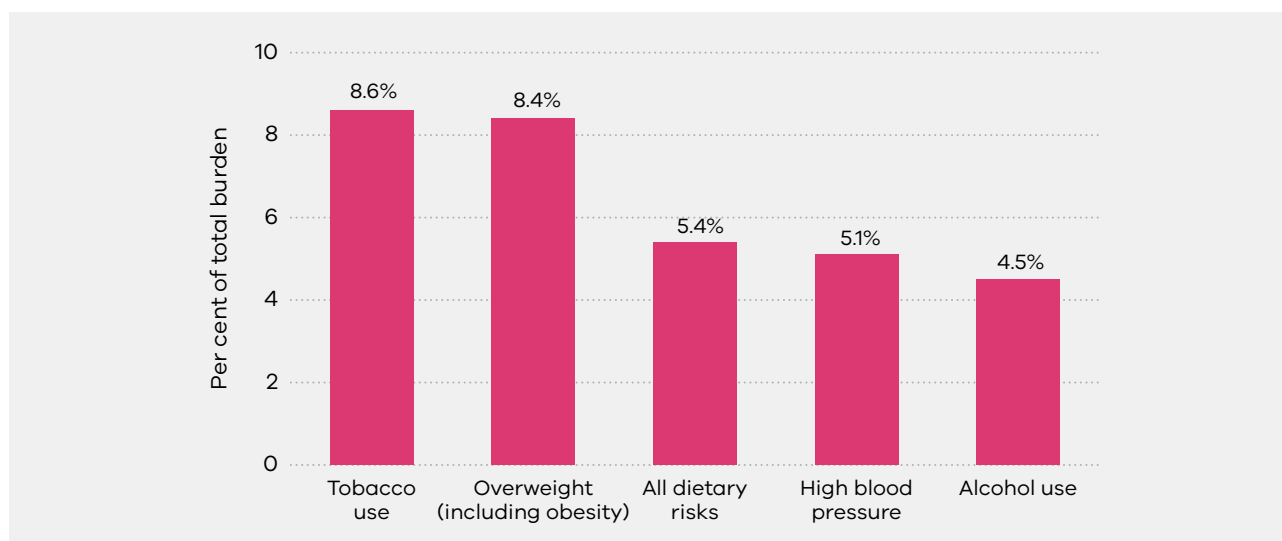
Almost half of all deaths (49 per cent) and fatal burden (48 per cent) could be attributed to the modifiable risk factors included in the study. This is due to the fact that a high proportion of leading causes of fatal burden, such as cancer and cardiovascular disease, are attributable to these risk factors (AIHW, 2021).

## Trends in risk factors in Victoria

Smoking is still the greatest contributor to the disease burden, responsible for 8.6 per cent of the disease burden in Australia.

However, when all dietary factors are considered together – overweight and obesity (8.4 per cent), dietary risks (5.4 per cent), and high blood glucose (4.3 per cent) – it shows how important it is to address diet-related factors when discussing efforts to reduce the disease burden in Australia.

Figure 2. Per cent of total burden by disease with a modifiable risk factor



Source: AIHW 2021, Australian Burden of Disease Study: impact and causes of illness and death in Australia 2018.



## Causes of death in Victoria

### Leading causes of death in 2019

In 2019 there were 43,944 deaths in Victoria: 22,879 were male and 21,065 female (ABS, 2019).

Ischaemic heart diseases remained the leading cause of death for males and females, accounting for 11.09 per cent of all deaths (ABS, 2019).

The second leading cause of death was 'malignant neoplasms of digestive organs' (including pancreatic, intestinal, liver, gastric and oesophageal cancers), which accounted for 8.25 per cent of all deaths (ABS, 2019).

Other forms of heart disease and cerebrovascular diseases were the third and fifth leading causes of death, counting for 6.18 and 5.48 per cent of all deaths, respectively (ABS, 2019). These numbers highlight the significant burden of cardiovascular diseases on the Victorian population.

### Perinatal mortality

In 2019, 78,954 babies were born in Victoria, 433 more births than in 2018. Of these births there were 860 perinatal deaths, giving an adjusted perinatal mortality rate of 8.7 per 1,000 births. This was a slight increase from 8.6 per 1,000 perinatal deaths in 2018 (CCOPMM, 2021).

Congenital anomaly (including termination of pregnancy for congenital anomaly) was the most common cause of death for adjusted stillbirths and neonatal deaths. Congenital anomaly accounted for 43 per cent of all adjusted perinatal deaths (CCOPMM, 2021).

### Intentional self-harm (suicides)

In 2019, there were 717 deaths in Victoria due to intentional self-harm (suicides). Males accounted for 548 of these deaths (76.43 per cent) and females accounted for 169 (23.57 per cent) (ABS, 2019).

**Table 1. Ten leading causes of death in Victoria in 2019**

Causes of death	Males	Females	Persons	Percentage of all deaths
Ischaemic heart diseases	2,985	1,888	4,873	11.09
Malignant neoplasms of digestive organs	2,095	1,529	3,624	8.25
Other forms of heart disease	1,254	1,461	2,715	6.18
Organic, including symptomatic, mental disorders	913	1,576	2,489	5.66
Cerebrovascular diseases	1,015	1,392	2,407	5.48
Malignant neoplasms of respiratory and intrathoracic organs	1,341	913	2,254	5.13
Chronic lower respiratory diseases	1,031	975	2,006	4.56
Other degenerative diseases of the nervous system	561	977	1,538	3.50
Falls	664	688	1,352	3.08
Diabetes mellitus	674	592	1,266	2.88

Source: ABS 2019, [Causes of Death](https://www.abs.gov.au/statistics/health/causes-death/causes-death-australia/2019#key-statistics) <<https://www.abs.gov.au/statistics/health/causes-death/causes-death-australia/2019#key-statistics>>

For males, the age-standardised death rate from suicide was 16 per 100,000 persons in 2019, compared with a rate of 5.5 per 100,000 for females (ABS, 2019). The total age-standardised rate of deaths due to intentional self-harm was 10.7 per 100,000 persons for all Victorians (ABS, 2019).

For every suicide, there are many more people deeply affected including families, friends, and colleagues.

### Crisis Helplines

Lifeline: 13 11 14

Suicide Call Back Service: 1300 659 467

Kids Helpline (for young people aged 5 to 25 years): 1800 55 1800

Note: Care needs to be taken when interpreting Victorian Causes of death data for 2017, 2018, and 2019 due to an issue with death registrations – see [technical note on the ABS website for further information](https://www.abs.gov.au/methodologies/causes-death-australia-methodology/2019) <<https://www.abs.gov.au/methodologies/causes-death-australia-methodology/2019>>.

### What the Victorian Government is doing

In addition to measures to support healthy eating and [active living](https://www.health.vic.gov.au/health-strategies/increasing-active-living) <<https://www.health.vic.gov.au/health-strategies/increasing-active-living>> the Victorian Government through VicHealth also funds programs and initiatives that contribute to [obesity prevention](https://www.vichealth.vic.gov.au/media-and-resources/publications/obesity-consensus) <<https://www.vichealth.vic.gov.au/media-and-resources/publications/obesity-consensus>>.

## Smoking and vaping

Despite considerable progress in reducing smoking rates in Victoria, tobacco use remains the leading contributor to the burden of disease and premature deaths.

The proportion of Victorians who are daily smokers continued to decline from 11.7 percent in 2016 to 10.2 percent in 2019. This decline coincided with an increase in the proportion of Victorians using e-cigarettes, or vaping, which rose from 0.9 per cent in 2016 to 2.4 per cent in 2019.



There has been a **continued decline** in Victorian's that smoke daily.

**11.7%** in 2016

**10.2%** in 2019



Smoking increases the risk of lung cancer, cardiovascular disease, chronic obstructive pulmonary disease, and many other illnesses. Evidence suggests that smoking kills almost two-in-three regular users. Smokers die on average 10 years younger than non-smokers (Banks et al, 2015).

Smoking is responsible for approximately 8.6 per cent of the disease burden and almost 13 per cent of deaths in Australia. Smoking contributes to 21.5 per cent of the cancer burden and 39.3 per of the respiratory disease burden (Australian Burden of Disease Study, 2018).

While the long-term harms are not yet known, there is increasing evidence that the use of e-cigarettes, with or without nicotine, can also lead to adverse health impacts. Numerous potentially hazardous substances and particulate matter have been identified in the emissions from e cigarettes that are likely to cause diseases such cancer and respiratory disease.

## Overweight and obesity

Overweight and obesity was the second leading cause of modifiable disease burden in Australia in 2018, accounting for 8.4 per cent of all disease burden.

Overweight (including obesity) contributed to 10 per cent of deaths, 9.6 per cent of fatal burden and 7.4 per cent of non-fatal burden (AIHW, 2021).

Overweight and obesity are significant risk factors for hypertension, cardiovascular disease, type 2 diabetes, gallbladder disease, musculoskeletal disorders, some cancers (endometrial, breast and bowel), psychological disorders, and breathing difficulties (WHO, 2013).

In Victoria, the proportion of adults who were overweight in 2019 was 51.6 per cent. Table 2

shows the proportion of men overweight and/or obese was significantly higher, compared with women. Rates of obesity were also higher among people who did not complete high school or who rented their home, compared with the proportion in all Victorian adults (VAHI, 2019).

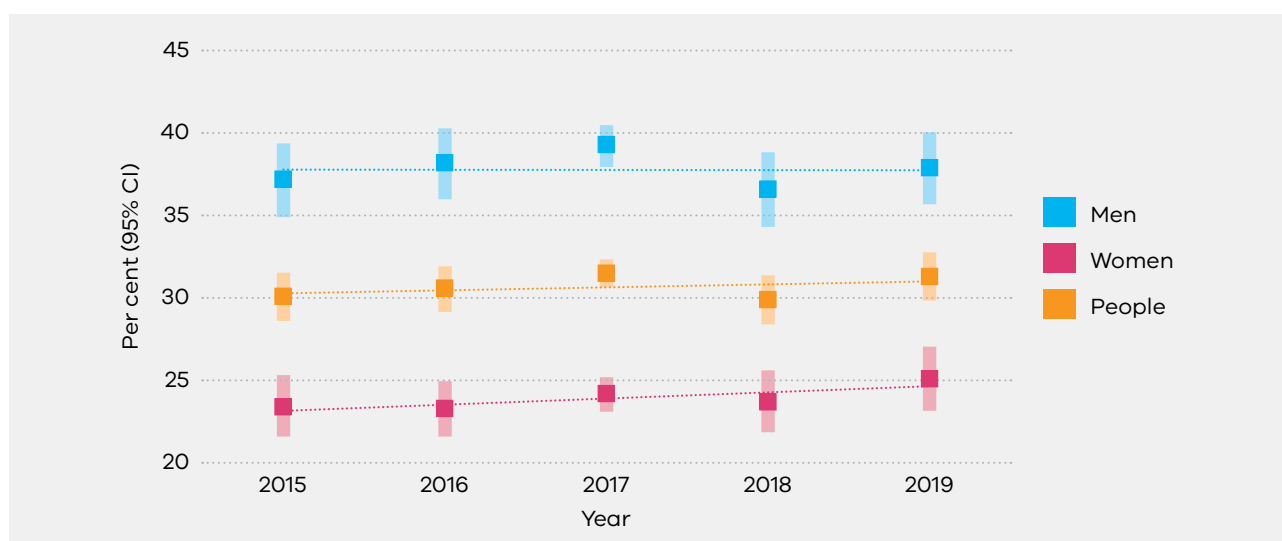
The proportion of adults who were normal weight was 36.8 per cent overall, significantly lower in men (34 per cent) compared with women (39.4 per cent).

Over the past five years, estimates of adults who were overweight, but not obese, have slightly increased (VAHI, 2019). To prevent and reduce current rates overweight and obesity, Victorians need to choose healthier, lower-energy foods, and be more physically active.

**Table 2. Proportion of overweight and obese Victorian adults (aged 18 and over)**

Body mass index (BMI)	Men	Women	Overall
Overweight (BMI $\geq 25$ kg/m <sup>2</sup> )	58.6%	44.9%	51.6%
Overweight, but not obese (25 $\geq$ BMI < 30 kg/m <sup>2</sup> )	37.9%	25.2%	31.3%
Obese	20.7%	19.8%	20.3%
Normal weight (BMI 18.5–25 kg/m <sup>2</sup> )	34.0%	39.4%	36.8%

**Figure 3. Proportion of adult population (18+ years) who were overweight, but not obese, based on body mass index and by gender, Victoria, 2015–2019**



Data were age-standardised to the 2011 Victorian population.

LL/UL 95% CI = lower/upper limit of 95% confidence interval.

\*BMI computed from self-reported height and weight [BMI = weight (kg) / height squared (m<sup>2</sup>)].

In addition, almost a quarter (22.6 per cent) of Australian children are overweight or obese (ABS, 2018).

This figure is concerning because obese children and adolescents are five times more likely to be obese in adulthood than those who are not obese, with 80 per cent of obese adolescents becoming obese adults (Simmonds et al, 2016).

### Dietary factors

Dietary risk factors were the third leading cause of modifiable disease burden in Australia in 2018, contributing to 9.9 per cent of deaths and 8.8 per cent of fatal burden. In addition, overweight and obesity were linked to diet (AIHW 2021).

Among these dietary risk factors, a diet low in legumes contributed the most to disease burden (1.2 per cent), followed by a diet low in wholegrains/high fibre cereals, a diet high in sodium and high in red meat (all 0.9 per cent), a diet low in fruit (0.8 per cent), low in nuts/seeds (0.7 per cent), and low in vegetables (0.6 per cent).

See the 'Healthy eating' section of 'Chapter 9 – Healthy eating' for more information about dietary factors.

### High blood glucose burden

The rate of type 2 diabetes has risen in recent decades, particularly among older people.

In 2019, 5.7 per cent of Victorians reported having type 2 diabetes (VAHI 2021).

### Physical inactivity

In 2018, physical inactivity contributed to 8,253 (5.2 per cent) deaths, 3.6 per cent of fatal burden (84,717 years of life lost or YLL) and 1.5 per cent of non-fatal burden (37,966 years lived with disability or YLD) in Australia (AIHW, 2021).

See the 'Active living' section of 'Chapter 9 – Health living' for more information about physical inactivity.

### Preventing or modifying risk factors

Many disease burden risk factors can be prevented or modified.

For example, people can work towards quitting smoking, reducing alcohol intake, exercising more, and eating more fruit and vegetables.

However, according to the social determinants of health framework, some groups in society have more access than others to the resources needed to address risk factors.

### Alcohol use

The consumption of alcohol is a major cause of preventable disease and illness in Australia.

### Prevalence of alcohol consumption

While overall alcohol consumption is declining, the prevalence of at-risk drinking remains high. In 2019, 18 per cent of Australians consumed alcohol at levels that placing them at lifetime risk of an alcohol-related disease or injury (*Alcohol, tobacco and other drugs in Australia*, AIHW, 2020).

Some cohorts are drinking at riskier levels than others:

- Men are more than twice as likely as women to drink at risky levels (26 per cent and 10 per cent, respectively).
- Men aged in their 50s are the most likely (30 per cent) to drink at risky levels (AIHW, 2019). This trend has changed since 2016, when men aged in their 40s were most likely to drink at risky levels.
- Among women, those aged in their 40s are the most likely (13 per cent) to drink at risky levels (AIHW, 2019). This has also changed since 2016 when women aged in their 50s were most likely to drink at risky levels.

In 2019, four-in-five Australian adults consumed alcohol in the previous 12 months and one-in-seven consumed 11 or more standard drinks at least once in the previous 12 months (*National Drug Strategy Household Survey 2019*, AIHW, 2020).

## Harm caused by alcohol

Harms caused by excessive alcohol consumption are not limited to alcohol dependence.

For example, chronic use of alcohol was estimated to contribute 3.3 per cent of Australia's cancer burden in 2017–18 (*Cancer in Australia*, AIHW, 2019).

In addition, alcohol is associated with increased:

- Abusive behaviour. In the previous 12 months, 21 per cent of people had been verbally or physically abused, or put in fear by someone under the influence of alcohol (*National Drug Strategy Household Survey 2019*, AIHW).
- Injury and violence, including family violence. For example, in 2017–18 in Victoria, alcohol was involved in 11,818 'definite or possible' family violence incidences (Turning Point, 2017a).
- Pressure on our emergency health system. In 2017–18, alcohol intoxication accounted for 34,843 ambulance attendances (Turning Point, 2017b).

In Victoria, a third of people presenting to the specialist alcohol and other drug treatment system listed alcohol as their primary drug of concern (Turning Point, 2017c).

## Responding to alcohol harms

In 2019, the Victorian Government invested \$273 million in alcohol and other drug services, an increase of 65 per cent through the previous five state budgets.

## Find out more

For more information on alcohol treatment services, visit the department's [Alcohol and other drug treatment services webpage](https://www.health.vic.gov.au/alcohol-and-drugs/alcohol-and-other-drug-treatment-services) <<https://www.health.vic.gov.au/alcohol-and-drugs/alcohol-and-other-drug-treatment-services>>.

For more information on links between alcohol and cancer, visit the Cancer Council Australia's [Impact: cancer and alcohol webpage](https://wiki.cancer.org.au/policy/Alcohol/Impact:_Alcohol_and_cancer#_ga=2.153393851.2034685423.1555048939-1873530676.1555048939) <[https://wiki.cancer.org.au/policy/Alcohol/Impact:\\_Alcohol\\_and\\_cancer#\\_ga=2.153393851.2034685423.1555048939-1873530676.1555048939](https://wiki.cancer.org.au/policy/Alcohol/Impact:_Alcohol_and_cancer#_ga=2.153393851.2034685423.1555048939-1873530676.1555048939)>.

## References

Australian Bureau of Statistics 2019, Causes of Death 2019, Australia, Australian Bureau of Statistics, Canberra <<https://www.abs.gov.au/statistics/health/causes-death/causes-death-australia/2019#:~:text=Media%20releases-,Key%20statistics,was%2012.9%20per%20100%2C000%20people>>.

Australian Bureau of Statistics 2018, 'National health survey 2017–18', Australian Bureau of Statistics, Canberra.

Australian Bureau of Statistics 2019, 'Causes of Death, Victoria 2019', Australian Bureau of Statistics, Canberra.

Australian Institute of Health and Welfare 2019, 'Australian burden of disease study: impact and causes of illness and death in Australia 2015', Australian Institute of Health and Welfare, Canberra.

Australian Institute of Health and Welfare 2019, Cancer in Australia, Australian Government, Canberra <<https://www.aihw.gov.au/getmedia/8c9fcf52-0055-41a0-96d9-f81b0feb98cf/aihw-can-123.pdf.aspx?inline=true>>.

Australian Institute of Health and Welfare 2020, National drug strategy household survey (NDSHS) 2019, Australian Institute of Health and Welfare, Canberra <<https://www.aihw.gov.au/getmedia/77dbea6e-f071-495c-b71e-3a632237269d/aihw-phe-270.pdf.aspx?inline=true>>.

Australian Institute of Health and Welfare 2020, 'Overweight and obesity among Australian children and adults'. Cat. no. PHE 274. Canberra: AIHW.

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

Australian Institute of Health and Welfare 2021, *Australian Burden of Disease Study 2018: Interactive data on risk factor burden*, AIHW, Australian Government, (viewed 06 October 2022). <<https://www.aihw.gov.au/reports/burden-of-disease/abds-2018-interactive-data-risk-factors>>.

Australian Institute of Health and Welfare 2021, *Australian Burden of Disease Study 2018: key findings for Aboriginal and Torres Strait Islander people*, AIHW, Australian Government, (viewed 06 October 2022). <<https://www.aihw.gov.au/reports/burden-of-disease/australian-bod-study-2018-key-findings-indigenous>>.

Australian Institute of Health and Welfare 2022, Alcohol, tobacco and other drugs in Australia, Australian Government, Canberra <<https://www.aihw.gov.au/reports/alcohol/alcohol-tobacco-other-drugs-australia/contents/about>>.

Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM), 2021, *Victoria's Mothers, Babies and Children 2019*, Safer Care Victoria, Victorian Government, Melbourne.

Simmonds M, Llewellyn A, Owen C and Woolacott N, 2016, 'Predicting adult obesity from childhood obesity: a systematic review and meta-analysis', *Obesity Reviews*, vol. 174, no. 2.

Turning Point 2017a – AODstats 2019, Alcohol and family violence, Turning Point, Melbourne <<https://aodstats.org.au/explore-data/family-violence/>>.

Turning Point 2017b, AODstats 2019 Ambulance and alcohol and drug statistics, Turning Point, Melbourne <<https://aodstats.org.au/explore-data/ambulance-attendances/>>.

Turning Point 2017c, AODstats 2019 Specialist alcohol and drug treatment, Turning Point, Melbourne <<https://aodstats.org.au/explore-data/treatment-services-vadc/>>.

Victorian Agency for Health Information 2019, 'Victorian Population Health Survey 2019', State of Victoria, Melbourne.

Victorian Agency for Health Information 2021, 'Victorian Population Health Survey 2019: summary of results', State of Victoria, Melbourne.

World Health Organization 2013, 'Overweight and obesity fact sheet number 311', World Health Organization, Geneva.





# Chapter 9 – Healthy living

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This section of *Your health* provides information on healthy living, including the recommended daily intake of fruit and vegetables and the recommended daily amount of physical activity. It also discusses how importance of quitting smoking.

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## Healthy eating

Poor diet is a leading contributor to chronic disease and premature death in Victoria.

Good nutrition is essential for health and wellbeing because it helps maintain mental and physical health, a healthy weight, resistance to infection, and protect against chronic disease. For infants and children, good nutrition is essential for optimal growth, development, and learning.

Poor diet increases the risk of cardiovascular disease, type 2 diabetes, and some cancers associated with obesity.

Healthy eating has strong links to promoting mental health and treating mental illness, such as depression. For example, people who eat a healthy diet (a diet rich in vegetables, fruits, wholegrains, fish) are up to 35 per cent less likely to experience depression. Conversely, a diet high in processed and nutritionally poor foods can increase the risk of developing depression (Deakin University Food and Mood Centre, 2018).

Promoting healthy eating offers co-benefits for mitigating climate change and reducing environmental impacts. For example, a diet high in fruit and vegetables and low in highly processed, discretionary foods can have less impact on the environment.

## Dietary recommendations

Dietary recommendations for health focus on encouraging a wide variety of nutritious foods from the five food groups every day. These recommendations are outlined in the 2013 Australian dietary guidelines.

Fruits and vegetables are important core foods that should form the foundation of a healthy diet.

These foods provide essential vitamins, minerals, and dietary fibre. They are critical for the prevention of many chronic diseases.

It is important to reduce discretionary food and drinks that is high in energy, saturated fat, added sugar and/or salt – including junk food such as sugar-sweetened beverages, many takeaway or 'fast foods', and alcohol.

Sugar-sweetened beverages in particular are associated with lower intakes of nutrients and an increased risk of weight gain and obesity, diabetes, and tooth decay (NHMRC, 2013).

## The state of healthy eating in Victoria

The following data relates to measures based on nationally-agreed standards (NHMRC, 2013), including:

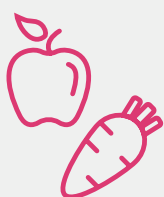
- The proportion of adults, adolescents, and children who reported consuming the recommended serves of fruit and vegetables to meet the 2013 Australian dietary guidelines.
- The proportion of adults, adolescents, and children who consumed sugar-sweetened beverages daily.
- The proportion of adults who consumed fast food/takeaway (meals or snacks such as burgers, pizza, fried chicken or chips from fast food chains or local take-away places) daily, weekly, monthly, or annually.

- Food insecurity with hunger was measured by asking the question: 'In the past 12 months was there any time when you ran out of food and couldn't afford to buy more?'
- Food insecurity without hunger was measured by asking about: worrying about running out of money to buy food; reliance on unhealthy low-cost food as a strategy to avoid running out of money to buy food; and not always having healthy food because of the belief that healthy food was too expensive.

### Fruit and vegetable intake

Many Victorians do not consume enough of the foods and drinks they need to stay healthy. For instance, fruit and vegetable intake for children and adults remains low and falls short of recommendations.

In 2019, only 3.6 per cent of adults in Victoria met the recommended minimum daily serves for vegetables and fruit. This low rate remained unchanged between 2015–2019. Fruit and vegetable consumption was lower in Victorians aged 25 to 34, with only 1.6 per cent meeting both fruit and vegetable guidelines, and higher in older adults, with 6.1 per cent aged between 75 to 84 eating sufficient fruit and vegetables (VAHI, 2021a).



**3.6%** of Victorian **adults** met the recommended **minimum daily serves** for fruits and vegetables

In 2017–18, only 6.5 per cent of Victorian children aged 2 to 17, met the daily intake guidelines for both vegetables and fruit (ABS, 2018).

When looking at fruit and vegetable intake separately, 5.7 per cent of Victorian adults met vegetable consumption guidelines and 40.6 per cent consumed enough fruit (VAHI, 2021a).

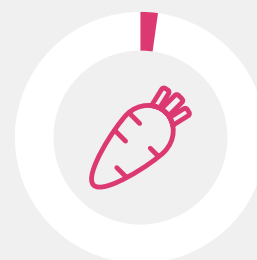
The proportion of men meeting fruit and vegetable consumption guidelines (combined or separately) was significantly lower than for women. For example, 1 per cent of men met both fruit and vegetable recommendation daily serves compared with 6.1 per cent of women (VAHI, 2021a).

In 2019, of Victorian children aged 4 to 12:

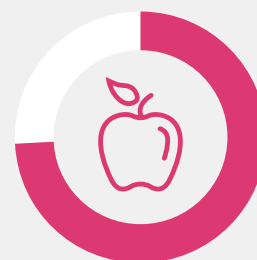
- 2.4 per cent met the minimum guidelines for daily vegetable consumption. Overall, this is consistent with previous surveys (2013, 2017), except for children living in a one-parent family of which there has been a significant decrease (from 2017–2019) in the proportion meeting the recommended vegetable intake.
- Around three-quarters (74.3 per cent) met the minimum guidelines for daily fruit consumption – similar to previous survey results. Children living in the least disadvantaged areas, those in couple families and those aged 4 to 8 years old were more likely to meet the guidelines, compared with other cohorts (Department of Education and Training, 2020).

For **children** aged between **4–12 years**:

**2.4%** met daily vegetable consumption minimum guidelines



**74.3%** met daily fruit consumption minimum guidelines



### Sugar sweetened beverages

In 2017, 10 per cent of Victorian adults consumed sugar-sweetened beverages daily (DHHS, 2018).

A significantly higher proportion of men (13.4 per cent) were daily consumers of sugar-sweetened beverages compared with women (6.7 per cent) (DHHS, 2018).

Daily consumption of sugar-sweetened beverages varied significantly between population subgroups, including between LGAs (DHHS, 2018).

Of Victorian children aged 2 to 17, almost one-third (31.0 per cent) consumed sugar-sweetened drinks one to three days a week. One-in-20 (5.1 per cent) children drank sugar-sweetened drinks daily (ABS, 2018).

Overall, sugar-sweetened beverage consumption has decreased.

In the 2018–19 National Aboriginal and Torres Strait Islander Health Survey (NATSIHS), around half of Aboriginal Victorians aged 15 to 24 years (51.2 per cent) reported either not drinking sugary drinks or drinking them on only one or two days per week. However, around a quarter (24.5 per cent) reported drinking sugary drinks every day.

### Takeaway or 'fast' foods

In 2019, 18.8 per cent of Victorians surveyed ate takeaway foods (such as burgers, pizza, fried chicken or chips) more than once a week. More males (24.3 per cent) compared to females (13.1 per cent) ate takeaway more than once per week. Younger adults (aged 18 to 34) were also more likely to eat fast food more than once a week. For example, 44.8 per cent of 18 to 24 year old males ate fast food more than once a week (VAHI, 2021b).



Source: Victorian Population Health Survey, 2019

## Food insecurity

### Food insecurity with hunger

In 2019, 6.5 per cent of adults ran out of food and could not afford to buy more and 5.9 per cent of children aged 0 to 12 lived in households that ran out of food and could not afford to buy more (VAHI, 2021).

### Food insecurity without hunger

In 2014, 37 per cent (1,689,066) of Victorian adults surveyed reported experiencing food insecurity without hunger:

- One-in-eight adults worried about running out of money to buy food
- One-in-eight parents relied on unhealthy low-cost food for their children as a strategy to avoid running out of money to buy food and
- One-in-five adults did not always have healthy food because they believed that healthy food was too expensive (*Challenges to healthy eating – food insecurity in Victoria: findings from the 2014 Victorian Population Health Survey*; VAHI, 2021).

Food insecurity is disproportionately experienced by some key sub-populations. These at-risk groups include: younger adults (aged 18 to 44 years); adults identifying as Aboriginal and/or Torres Strait Islander (almost one-in-five); people who were widowed, divorced/separated or never married; single parents; people who were unemployed and/or had a low household income (of < \$40,000); people who rented their home; and adults who lived in rural Victoria (*Challenges to healthy eating – food insecurity in Victoria: findings from the 2014 Victorian Population Health Survey*; VAHI, 2021).

In addition, adults who were food insecure (with or without hunger) were more likely to abstain from the consumption of alcohol than those who were food secure. However adults who did drink alcohol were more likely to consume a higher quantity of alcohol when they were drinking.

Food insecurity in Victoria is strongly associated with obesity. This is referred to as the 'food insecurity–obesity paradox'. More than one-in-three obese adults in Victoria were food insecure with or without hunger (*Challenges to healthy eating – food insecurity in Victoria: findings from the 2014 Victorian Population Health Survey*; VAHI, 2021).

## The kilojoule labelling scheme

The Kilojoule Labelling Scheme is a Victorian Government initiative that came into effect in mid-2018. The scheme was designed to empower Victorian consumers by enabling them to compare the kilojoule (kJ) content of meals within and between large chain food outlets, and monitor and adjust their overall daily energy intake.

Kilojoule labelling is a cost effective and practical health scheme that complements a range of Victorian Government initiatives designed to combat preventable chronic diseases such as obesity, heart disease, diabetes, thrombosis, cholesterol, high blood pressure, and some cancers. Contributing to this disease burden are increased consumption of energy-dense foods (high kJ) and reduced physical activity.

Approximately two-thirds of Victorians are either obese or overweight. Obesity is estimated to cost Victoria \$14.4 billion a year when economic and social factors are considered. The scheme assists in addressing this significant public health issue in Victoria and is a significant addition to the efforts underway through the [Victorian Healthy Choices initiative](https://www.health.vic.gov.au/preventive-health/healthy-choices) <<https://www.health.vic.gov.au/preventive-health/healthy-choices>>.

Kilojoule labelling aims to promote healthy food and drink options in places where people tend to spend their time. Many people are unaware that a single fast-food meal may contain most of an adult's recommended daily kJ intake.

Implementation of the scheme has resulted in approximately 3,000 Victorian chain food businesses, plus approximately 570 supermarkets being required to display kJ information.

The scheme requires large chain food outlets/ restaurants and large chain supermarkets to display:

- the average kJ content of standardised, ready to eat food and non-alcoholic drinks on menus, menu boards, posters, food labels and price tags
- the statement 'The average adult daily energy intake is 8,700kJ' on menus, menu boards and display cabinets where food is displayed for sale.

The key objectives of the scheme are to:

- provide consumers with consistent and transparent kilojoule information about food and drinks at point-of-sale in qualifying chain food outlets
- allow consumers to compare relative kilojoule content of food and drinks for sale
- improve consumers' general awareness about the recommended daily kilojoule intake and how this contributes to maintaining a healthy weight.

The **kJ menu surveillance program** reviewed a sample of large chain food premises to ascertain level of compliance with changes to the *Victorian Food Act 1984*, that came into effect on 1 May 2018. Approximately one year later in April/ May 2019 further surveillance was undertaken to compare results against the baseline results obtained in 2018.

A summary of some results across the 110 large chain food premise reviews:

- Menu boards in large chain food businesses displaying kJ content increased from 80 per cent in 2018 to 100 per cent in 2019.
- In printed menus and posters, the kJ content of standard food items displayed increased from 75 per cent in 2018 to 100 per cent in 2019.

Additionally, between June 2018 and March 2019 the department reviewed 141 websites and found that 100 per cent of food business websites provided nutrition/kJ information in PDF format displayed the kJ content for standard food items.

To see the full list of results are published on the department's [health.vic website <https://www.health.vic.gov.au/publications/kilojoule-labelling-scheme-victoria>](https://www.health.vic.gov.au/publications/kilojoule-labelling-scheme-victoria).

## What the Victorian Government is doing

In addition to the Kilojoule Labelling Scheme, Victorian Government is taking a range of complementary actions to ensure sustained change.

Those actions include:

- Promoting the Healthy Choices policy/ guidelines to increase provision and promotion of healthy foods and drinks, and reduce unhealthy food and drinks in health services, sport and recreation centres, parks and workplaces, supported by the Healthy Eating Advisory Service.
- Promoting the uptake of aligned healthy food policies and guidelines in early years services and schools, supported by the Healthy Eating Advisory Service.
- Delivering a healthy and more sustainable food procurement policy across government departments.
- Delivering the Healthy Schools, Healthy Early Childhood Services and Healthy Workplaces Achievement Program (led by Cancer Council Victoria). This initiative is a free health and wellbeing program that provides quality health promotion benchmarks and Victorian Government recognition for key areas of health – including healthy eating and oral health, mental health, physical activity, sexual health, tobacco, alcohol, and other drugs.

- Delivering the INFANT (Infant Feeding Active Play and NuTrition) program. INFANT helps first-time parents establish healthy eating and physical activity behaviours for themselves and their children. It has shown sustained (at ages two and five) and positive impacts on fruit, vegetable, water and sugar-sweetened beverage intake and less television watching. The department is providing funding to the Institute for Physical Activity and Nutrition at Deakin University to enhance implementation of INFANT across Victoria in 2021.
- Delivering Life! – a free healthy lifestyle program that helps Victorians improve their eating habits, increase physical activity and manage stress. Run by experienced health professionals, Life! offers group courses or a telephone health coaching service. The program supports participants with making small lifestyle changes to reduce the risk of type 2 diabetes and cardiovascular disease. Life! is funded by the Victorian Government and coordinated by Diabetes Victoria.
- Supporting the Victorian Aboriginal Community Controlled Health Organisation (VACCHO)'s Nutrition team. The team works collaboratively with Member ACCOs and key stakeholders to improve food and nutrition outcomes for Aboriginal and Torres Strait Islander communities across Victoria. VACCHO's work with the Victorian Government is based on a commitment to Aboriginal self-determination. For more information visit the VACCHO website.
- Delivering the Victorian Healthy Eating Enterprise (VHEE). VHEE provides a coordinated platform where local governments, businesses, community health services, academics, health professionals, and peak health bodies can collaborate and progress collective action on a healthy food system and vibrant healthy eating culture across Victoria.
- Delivering *Healthy Kids, Healthy Futures* – the Victorian Government's five-year action plan to support children and young people to be healthy, active and well. The plan aims to lay the foundations for life-long health and wellbeing. It has a focus on creating places that support children and young people to be healthy and well, providing and promoting healthy food and drink, creating more opportunities to be active throughout the day, and supporting mental wellbeing in places where children spend their time.
- Delivering *Vic Kids Eat Well* – an exciting new state-wide initiative (led by Cancer Council Victoria and Nutrition Australia) that aims to boost healthy food and drink options in the places children spend their time, including schools, out of school hours care, sports clubs, recreation facilities, and council and community facilities.
- Supporting *Healthy Kids Advisors*. Delivered by the Stephanie Alexander Kitchen Garden Foundation and supported by the Australian and Victorian Governments, the program provides hands-on support in 13 priority areas to help achieve fairer health outcomes, with a focus on healthy eating and supporting implementation of Vic Kids Eat Well. As part of VicHealth's collective effort with its partners, Healthy Kids Advisors are active in areas that align with [VicHealth's Local Government Partnerships](https://www.vichealth.vic.gov.au/our-work/local-government-partnership) <<https://www.vichealth.vic.gov.au/our-work/local-government-partnership>>. These partnerships aim to support local action to ensure all children and young people have the opportunity to grow up active, socially connected, and healthy.

Through VicHealth, the Victorian Government also funds programs and initiatives that contribute to healthy food systems and obesity prevention.

### Find out more

For more information on healthy eating, please visit the department's [Healthy eating webpage](https://www.health.vic.gov.au/preventive-health/healthy-eating-nutrition) <<https://www.health.vic.gov.au/preventive-health/healthy-eating-nutrition>>.

## Active living

Leading an active life improves our health and wellbeing. Regular physical activity promotes healthy growth and development, and together with healthy eating helps to maintain healthy weight and helps to prevent and treat many diseases such as: heart disease; some cancers; diabetes; and musculoskeletal conditions. (Booth, Roberts and Laye, 2012; Pedersen and Saltin, 2015). Physical activity also improves mood, concentration and sleep and can alleviate the severity of mental health issues, such as depression and anxiety (Department of Health, 2021; Better Health Channel). Physical activity in the form of active transport (such as walking or cycling instead of driving) can also reduce emissions associated with climate change and improve local air quality.

Victorians' lifestyles have become increasingly sedentary over recent decades. This transition is largely the result of the transition to desk-based work, the emergence of technology-saving devices, and the increased dependence on screen-based activities. Evidence indicates that prolonged sitting (or lying) is associated with premature mortality, type 2 diabetes, and risk factors for cardiovascular disease, irrespective of time spent being active (Dempsey, Biddle, Buman et al, 2020).

### How much physical activity is enough?

Table 1 outlines Australia's physical activity and sedentary behaviour guidelines for adults (Department of Health, 2014).

**Table 1. Australia's physical activity and sedentary behaviour guidelines for adults**

Aged 18 to 64 years	
Physical activity	<ul style="list-style-type: none"> <li>• Doing any physical activity is better than doing none. If you do no physical activity right now, start by doing some, then slowly build up to the recommended amount.</li> <li>• Adults should be active most days, preferably every day.</li> <li>• Each week, adults should do either:               <ul style="list-style-type: none"> <li>– 2.5 to 5 hours of moderate intensity physical activity – such as a brisk walk, golf, mowing the lawn or swimming</li> <li>– 1.25 to 2.5 hours of vigorous intensity physical activity – such as jogging, aerobics, fast cycling, soccer or netball or an equivalent combination of moderate and vigorous activities.</li> </ul> </li> <li>• Include muscle-strengthening activities as part of your daily physical activity on at least two days each week.</li> </ul>
Sedentary behaviour	<ul style="list-style-type: none"> <li>• Minimise the amount of time spent in prolonged sitting.</li> <li>• Break up long periods of sitting as often as possible.</li> </ul>
Aged 65 years or over	
Physical activity	<ul style="list-style-type: none"> <li>• Adults over 65 years should do at least 30 minutes of moderate intensity physical activity on most, preferably all, days.</li> <li>• If you find 30 minutes difficult right now, start with just 10 minutes once or twice a day. After two weeks, increase to 15 minutes twice a day.</li> <li>• If you can do more than 30 minutes, you will get extra benefits.</li> <li>• Over the course of the week, try to incorporate different types of activities.</li> </ul>
Sedentary behaviour	<ul style="list-style-type: none"> <li>• Try to reduce the time you spend sitting down – break that time up as often as you can.</li> </ul>

Table 2 outlines Australia’s movement guidelines for children 0 to 5 years.

**Table 2. Australian 24-Hour Movement Guidelines for the Early Years (birth to 5 years): An Integration of Physical Activity, Sedentary Behaviour, and Sleep (Department of Health, 2017)**

<b>Infants (aged less than 1 year)</b>	
Physical activity	<ul style="list-style-type: none"> <li>Physical activity: Being physically active several times a day in a variety of ways, particularly through supervised interactive floor-based play, including crawling. More is better. For those not yet mobile, this includes at least 30 minutes of tummy time, which includes reaching and grasping, pushing, and pulling. This activity should be spread throughout the day while awake.</li> </ul>
Sedentary behaviour	<ul style="list-style-type: none"> <li>Not being restrained for more than one hour at a time (such as in a stroller, car seat, or highchair). Screen time is not recommended. When sedentary, engaging in pursuits such as reading, singing, puzzles and storytelling with a caregiver is encouraged.</li> </ul>
Sleep	<ul style="list-style-type: none"> <li>14 to 17 hours (for those aged 0 to 3 months) and 12 to 16 hours (for those aged 4 to 11 months) of good quality sleep, including naps.</li> </ul>
<b>Toddlers (aged 1 to 2 years)</b>	
Physical activity	<ul style="list-style-type: none"> <li>At least 180 minutes spent in a variety of physical activities, including energetic play, spread throughout the day. More is better.</li> </ul>
Sedentary behaviour	<ul style="list-style-type: none"> <li>Not being restrained for more than one hour at a time (such as in a stroller, car seat, or highchair) or sitting for extended periods. For those younger than two years, sedentary screen time is not recommended. For those aged two years, sedentary screen time should be no more than one hour. Less screen time is better. When sedentary, engaging in pursuits such as reading, singing, puzzles and storytelling with a caregiver is encouraged.</li> </ul>
Sleep	<ul style="list-style-type: none"> <li>11 to 14 hours of good quality sleep, including naps, with consistent sleep and wake up times.</li> </ul>
<b>Pre-schoolers (3 to 5 years)</b>	
Physical activity	<ul style="list-style-type: none"> <li>At least 180 minutes spent in a variety of physical activities, of which at least 60 minutes is energetic play spread throughout the day. More is better.</li> </ul>
Sedentary behaviour	<ul style="list-style-type: none"> <li>Not being restrained for more than one hour at a time (such as in a stroller or car seat) or sitting for extended periods. Sedentary screen time should be no more than one hour. Less screen time is better. When sedentary, engaging in pursuits such as reading, singing, puzzles and storytelling with a caregiver is encouraged.</li> </ul>
Sleep	<ul style="list-style-type: none"> <li>10 to 13 hours of good quality sleep, which may include a nap, with consistent sleep and wake up times.</li> </ul>



Table 3 outlines Australia’s movement guidelines for children and young people (aged 5 to 17 years) (Department of Health, 2019)

**Table 3. Australia’s 24-hour movement guidelines for children and young people (5 to 17 years) (Department of Health, 2019)**

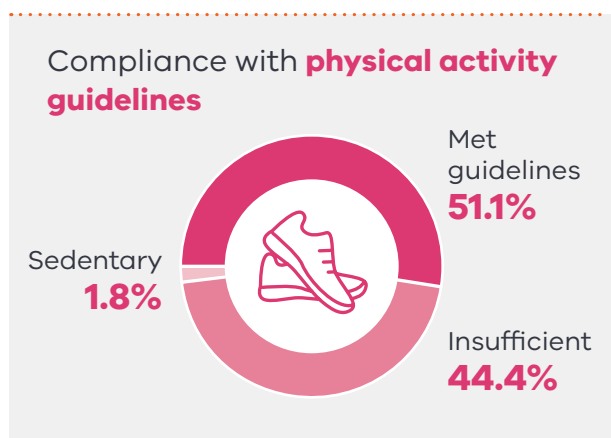
<b>Children and young people (aged 5 to 17 years)</b>	
Physical activity	<ul style="list-style-type: none"> <li>• Accumulating 60 minutes or more of moderate to vigorous physical activity per day involving mainly aerobic activities.</li> <li>• Activities that are vigorous, as well as those that strengthen muscle and bone, should be incorporated.</li> <li>• Several hours of a variety of light physical activities.</li> </ul>
Sedentary behaviour	<ul style="list-style-type: none"> <li>• Limiting sedentary recreational screen time to no more than 2 hours per day (excluding screen-based activities for educational uses).</li> <li>• Breaking up long periods of sitting as often as possible.</li> <li>• For greater health benefits, replace sedentary time with additional moderate-to-vigorous physical activity, while preserving sufficient sleep.</li> </ul>
Sleep	<ul style="list-style-type: none"> <li>• An uninterrupted 9 to 11 hours of sleep per night for those aged 5 to 13 years and 8 to 10 hours per night for those aged 14 to 17 years.</li> <li>• Consistent bed and wake-up times. Activities that are vigorous, as well as those that strengthen muscle and bone should be incorporated at least three days per week.</li> </ul>

## Physical activity in Victoria

### Adults

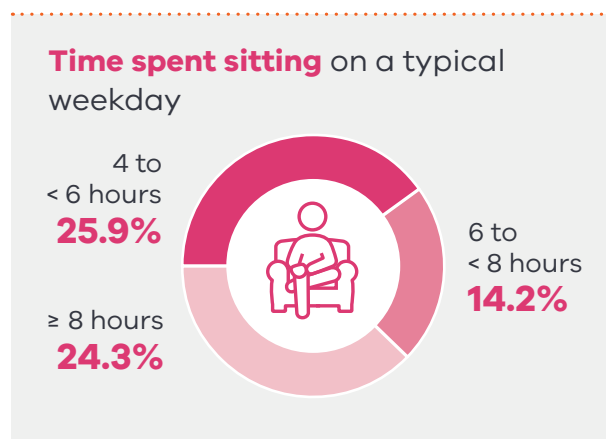
In 2019, 51.1 per cent of Victorian adults did sufficient physical activity (met the physical activity guidelines). This proportion was similar in men (53.0 per cent) and women (48.7 per cent) and remained stable since 2015. The proportion of adults who met physical activity guidelines was significantly higher for those aged 65 to 84 years and for people who had a tertiary university degree or a total annual household income of \$100,000 or more. There were no significant differences between rural Victorians and those from metropolitan areas (VAHI, 2021).

The proportion of adults who were sedentary (did no physical activity) was 1.8 per cent overall. This proportion was similar in men (1.9 per cent) and women (1.8 per cent).



Source: Victorian Population Health Survey, 2019

Nearly one quarter (24.3 per cent) of adults spent eight hours or more sitting on a typical weekday in 2019. This proportion was significantly higher in men (27.4 per cent) compared with women (21.4 per cent) (VAHI, 2021).



Source: Victorian Population Health Survey, 2019

### Children and young people

For Victorian children aged 5 to 12 years in 2019, around half (52.2 per cent) were physically active for an hour every day. This represented a significant decrease from 2013, when 62.2 per cent of children aged 5 to 12 were physically active for an hour a day (Department of Education and Training, 2020).

For older children, less than one-in-four (24 per cent) Year 5, 8, and 11 students met the national guidelines for 60 minutes of physical activity per day in 2018. Male students were more likely to meet this guideline. Physical activity rates declined with year levels, falling from 31 per cent in Year 5 to 12 per cent in Year 11 (Department of Education and Training, 2019).

Data from 2011–12 and 2012–13 collated by the Australian Institute of Health and Welfare showed that 59.9 per cent of Aboriginal children aged 5 to 12 and 33.4 per cent aged 13 to 17 met the physical activity guidelines. This result is higher than for non-Aboriginal children, who were at 45.1 per cent for ages 5 to 12 and 19 per cent for ages 13 to 17 (AIHW, 2018).

The 2018–19 National Aboriginal and Torres Strait Islander Health Survey (NATSIHS), found that very few Aboriginal and Torres Strait Islander young people met the physical activity guidelines for daily exercise (5 per cent for those aged 15 to 17 and 12 per cent for those aged 18 to 24) (ABS, 2019).

### Screen time

In 2019, one-in-five (20.2 percent) of Victorian children (5 to 12 years) exceeded the recommended two hours per day or less of recreational screen time, which can be associated with increased levels of sedentary behaviour (Department of Education and Training 2020). This represents an increase from previous years.

In 2018, almost two-thirds (64 per cent) of Victorian secondary school students (aged 10 to 17 years) surveyed, reported exceeding the recommended amount of two hours recreational screen time per day. The proportion of Year 11 students exceeding recommended screen time was markedly higher than students in Year 5 (78 per cent compared to 51 per cent) (Department of Education and Training, 2019).

### What the Victorian Government is doing

For more information on measures to increase active living, visit the department's [active living webpage](https://www.health.vic.gov.au/chief-health-officer/active-living) <<https://www.health.vic.gov.au/chief-health-officer/active-living>>.

### Find out more

For more information on active living, please visit the department's active living page.

## Tobacco and vape-free living

### Harms from tobacco use

Despite considerable progress in reducing smoking rates in Victoria, tobacco use remains a leading contributor to the burden of disease and premature deaths.

Smoking is responsible for approximately 8.6 per cent of the disease burden and almost 13 per cent of deaths in Australia (Australian Burden of Disease Study, 2018). Smoking increases the risk of lung cancer, cardiovascular disease, chronic obstructive pulmonary disease, and many other illnesses. Smokers die on average 10 years younger than non-smokers and around two-thirds of smokers will die from a smoking-related illness in Australia (Banks et al, 2015).

In Victoria, smoking claims approximately 4,400 lives a year. These deaths are all avoidable (Creating Preferred Futures, 2018).

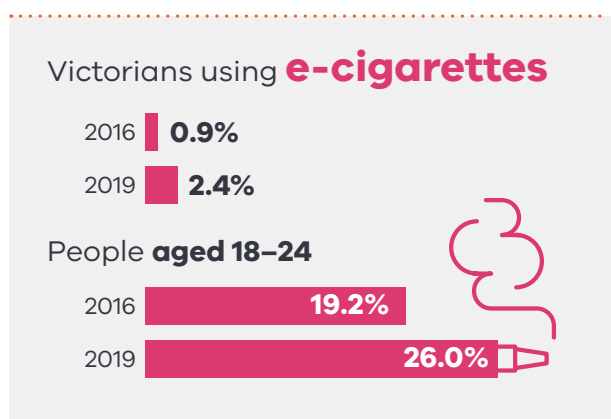
Besides causing considerable distress for individuals, families and communities, smoking costs the Victorian economy approximately \$3.7 billion in tangible costs such as health care, and \$5.8 billion in intangible costs associated with the loss of life every year (Creating Preferred Futures, 2018).

The health burden of tobacco use does not just affect people who smoke. Inhaling second-hand smoke or aerosol from a cigarette, cigar, pipe, hookah, or e-cigarette can also lead to adverse health impacts. The toxins from third-hand smoke can also remain in carpets, walls, furniture, clothing, hair, and toys.

Children who live in a smoking household are significantly more likely to suffer from bronchiolitis and other respiratory conditions (Jones et al, 2011). In addition, infants are at greater risk of sudden infant death syndrome (SIDS).

## Increase in e-cigarette use or vaping

In 2019, there was an increasing prevalence in e-cigarette use, or vaping. That increased prevalence of vaping included young people and people who had never smoked. The proportion of Victorians using e-cigarettes rose from 0.9 per cent in 2016 to 2.4 per cent in 2019. Lifetime use of e-cigarettes for people aged 18 to 24 rose from 19.2 per cent to 26 per cent, and for 25 to 29 year olds rose from 14.8 per cent to 20 per cent (National Household Drug Survey, 2019).



E-cigarettes are promoted by advocates as a tool for smoking cessation and harm minimisation due to the perception that vaping is less harmful than smoking. However, many smokers who use e-cigarettes continue to smoke, which does not lead to meaningful reductions in health risks and may be more harmful than smoking in isolation. The evidence that e-cigarettes are effective in assisting with smoking cessation is inconclusive.

The growing use of e-cigarettes is of significant concern. It is a concern because there is increasing evidence that the use of e-cigarettes, with or without nicotine, can lead to adverse health and wellbeing impacts. Those health and wellbeing impacts include nicotine dependence, poisoning, seizures (caused by acute nicotine toxicity), burns and injuries, lung injury, and an increased smoking uptake in non-smokers (Banks, 2022). The long-term effects of vaping will not be known for many years.

While the aerosols emitted from e-cigarettes do not contain tar or some of the chemicals found in ignited tobacco smoke, they do contain numerous potentially hazardous substances. Particulate matter has also been identified in e-cigarette emissions.

In 2019, a chemical assessment of non-nicotine e-liquids and e-cigarette emissions conducted by the National Industrial Chemicals Notification and Assessment Scheme (NICNAS) identified 243 unique chemicals. The chemicals included carbonyls such as acetaldehyde, acetone, acrolein and formaldehyde, which have been associated with adverse health outcomes in humans (Banks et al, 2022).

E-cigarettes are sold in fruity and confectionary flavours known to appeal to young people. As many of these products contain nicotine, vaping could lead to nicotine addiction for a new generation of people. Vaping also renormalises behaviours that resemble smoking and undermines the considerable progress made to date to reduce smoking rates in the community.

In 2018, a Victorian child died after ingesting nicotine intended for use in an e-cigarette. This tragedy led to a recommendation – in the Consultative Council on Obstetric and Paediatric Mortality and Morbidity's *Victoria's mothers, babies and children report 2018* – to strengthen the regulation and education on e-cigarettes and liquid nicotine.

In late 2019, an outbreak of e-cigarette related lung illness in the United States resulted in 2,807 known lung injury cases requiring hospitalisation and 68 confirmed deaths. This outbreak was primarily linked to Vitamin E acetate, which is used in e-cigarette products containing Tetrahydrocannabinol (THC), the principal psychoactive constituent of cannabis. The US incident highlighted the uncertainty around the ingredients in e-cigarette products and the lack of knowledge of the impacts of inhaling the aerosol created by heating these substances.

Victoria continues to take a precautionary approach on the use of e-cigarette products. No e-cigarette products have been approved by the Therapeutic Goods Administration as safe and effective for smoking cessation.

### At-risk cohorts

Although overall smoking rates have declined, the prevalence of smoking continues to be high in certain population groups – including Aboriginal communities; people who identify as LGBTIQ+; and people experiencing homelessness, mental illness or social, and economic disadvantage. That means the most vulnerable members of the community are at higher risk of health harms.

The Australian Bureau of Statistics (ABS) National Aboriginal and Torres Strait Islander Health Survey, 2018–19, showed that rates of smoking amongst Aboriginal people in Victoria had reduced from 39.8 per cent in 2014–15 to 35.5 per cent in 2018–19.

Aboriginal women are significantly more likely to smoke during pregnancy and the percentage is increasing, with 42.3 per cent of Aboriginal women smoking during pregnancy (up from 40.2 per cent in 2018) compared to 7.3 per cent of non-Aboriginal women. Smoking in pregnancy is linked with stillbirths and neonatal deaths (Consultative Council on Obstetric and Paediatric Mortality and Morbidity, 2019).

Find out more about at-risk cohorts in 'Chapter 10 – Maternal and infant health'.

Socioeconomically disadvantaged individuals are more likely to be current smokers. The proportion of adults who were daily smokers was significantly higher in people who did not complete high school; were unemployed; had a total annual household income of less than \$40,000; or rented their home. (Victorian Population Health Survey 2019)

A focus on priority populations, with continued high rates of smoking, is essential to further reduce Victoria's smoking rates and the devastating health effects of tobacco use on the Victorian community.

## Key statistics

### Smoking and vaping prevalence

The proportion of Victorians who are daily smokers continued to decline from 11.7 per cent in 2016 to 10.2 per cent in 2019. This coincided with an increase in Victorians using e-cigarettes from 0.9 per cent in 2016 to 2.4 per cent in 2019.

Among Aboriginal women, 42.3 per cent smoked during pregnancy (up from 40.2 per cent in 2018) compared to 7.3 per cent of non-Aboriginal women.

Four per cent of Victorian students aged 12 to 17 currently smoke (Centre for Behavioural Research in Cancer 2017).

Four per cent of Victorian students aged 12 to 17 years used an e-cigarette in the last month.

### Burden of disease

Tobacco use contributed to 13 per cent of all Australian deaths in 2018.

Nine per cent of Australia's disease and injury burden is attributable to tobacco smoking.

Smoking contributes to 21.5 per cent of the cancer burden and 39.3 per of the respiratory disease burden.

### Efforts to support tobacco and vape-free living

The department's activities to support tobacco and vape-free living include:

- developing an e-cigarette and nicotine communication plan with a short video, a factsheet and a social media campaign designed to build community awareness around child safety.
- advocating, on behalf of the Victorian Government, for a nationally consistent approach to regulating e-cigarette products, with a focus on child safety
- funding local councils, via the Municipal Association of Victoria, to deliver the Tobacco Education and Enforcement Program and carry out enforcement of the *Tobacco Act 1987*

- Implementing amendments to the *Tobacco Act 1987*, made in August 2017, that include banning smoking in outdoor dining areas and regulating e-cigarette products in the same way as tobacco products
- strengthening and expanding existing interpretation and enforcement guidance documents for local councils related to the *Tobacco Act 1987*
- responding to queries in the dedicated tobacco email inbox and through the tobacco information line
- funding smoking cessation services through the Victorian Quitline
- funding anti-smoking campaigns across television, radio, print and social media
- coordinating initiatives led by Aboriginal Victorians to reduce smoking in communities based on the principle of self-determination
- work by Safer Care Victoria to reduce the risk factors for stillbirths, including encouraging smoking cessation.

For more information, please visit the [department's tobacco reforms page](https://www.health.vic.gov.au/public-health/tobacco-reforms) <<https://www.health.vic.gov.au/public-health/tobacco-reforms>> or the [Better Health Channel](https://www.betterhealth.vic.gov.au/healthyliving/smoking-and-tobacco) <<https://www.betterhealth.vic.gov.au/healthyliving/smoking-and-tobacco>>.

## Find out more

Find out more about tobacco and e-cigarette use in the following links:

- [Victorian Population Health Survey 2019 – Summary of results | Victorian Agency for Health Information](https://www.vahi.vic.gov.au) <[vahi.vic.gov.au](https://www.vahi.vic.gov.au)>
- <<https://www.tobaccoinustralia.org.au/home.aspx>> (Cancer Council Victoria)
- [smoking and tobacco](https://www.betterhealth.vic.gov.au) <[betterhealth.vic.gov.au](https://www.betterhealth.vic.gov.au)>
- [e-cigarettes – Better Health Channel](https://www.betterhealth.vic.gov.au/healthyliving/e-cigarettes) <<https://www.betterhealth.vic.gov.au/healthyliving/e-cigarettes>>
- [Talking about vaping with young people – Alcohol and Drug Foundation](https://www.adf.org.au) <[adf.org.au](https://www.adf.org.au)>
- <[https://www.rch.org.au/kidsinfo/fact\\_sheets/E-cigarettes\\_and\\_teens/](https://www.rch.org.au/kidsinfo/fact_sheets/E-cigarettes_and_teens/)>
- <<https://www.quit.org.au/resources/resources-communities-and-places/e-cigarettes-and-vaping/>>
- <[https://www.cdc.gov/tobacco/basic\\_information/e-cigarettes/severe-lung-disease.html](https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease.html)>

For information and support to quit smoking or nicotine addiction, visit [Quit Victoria](https://www.quit.org.au) <<https://www.quit.org.au>>.

## References

Australian Bureau of Statistics 2018, National health survey: first results 2017–18 – State and territory findings Australian Bureau of Statistics, Canberra. [cited 19 September 2022]. Available from: <<http://www.abs.gov.au/statistics/health/health-conditions-and-risks/dietary-behaviour/2017-18#state-and-territory-findings>>.

Australian Bureau of Statistics 2020, 'National Aboriginal and Torres Strait Islander Health Survey', 2018–19, ABS, Canberra.

Australian Bureau of Statistics, 'National Aboriginal and Torres Strait Islander social survey 2018–19', ABS, Canberra.

Australian Bureau of Statistics 2020, 4715.0 National Aboriginal and Torres Strait Islander Health Survey, Australia: 2018–19 (Table 21.3 in Health risk factors – diet, body mass, blood pressure, physical activity data download). ABS, Canberra. [cited 28 September 2022] Available from: <<https://www.abs.gov.au/statistics/people/aboriginal-and-torres-strait-islander-peoples/national-aboriginal-and-torres-strait-islander-health-survey/latest-release#data-download>>.

Australian Institute of Health and Welfare 2018, 'Aboriginal and Torres Strait Islander Health Performance Framework (HPF) report 2017'. Canberra: AIHW.

Australian Institute of Health and Welfare 2018, Australian burden of disease study: impact and causes of illness and death in Australia 2018, Australian Institute of Health and Welfare, Canberra.

Australian Institute of Health and Welfare 2019, National drug strategy household survey 2019: detailed findings, Australian Institute of Health and Welfare, Canberra.

Banks E, Joshy G, Weber M, Liu B and Grenfell R 2015, 'Tobacco smoking and all-cause mortality in a large Australian cohort study: findings from a mature epidemic with current low smoking prevalence', BMC Medicine vol. 13, no. 1.

Banks E, Yazidjoglou A, Brown S, Nguyen M, Martin M, Beckwith K, Daluwatta A, Campbell S, Joshy G 2022, 'Electronic cigarettes and health outcomes: systematic review of global evidence'. Report for the Australian Department of Health. National Centre for Epidemiology and Population Health, Canberra: April 2022.

Booth F, Roberts C and Laye M 2012, 'Lack of exercise is a major cause of chronic diseases', Comprehensive Physiology, vol. 2, no. 2.

Centre for Behavioural Research in Cancer 2018, 'Victorian secondary school students' use of licit and illicit substances in 2017: results from the 2017 Australian Secondary Students' Alcohol and Drugs (ASSAD) Survey', Cancer Council Victoria, Melbourne.

Consultative Council on Obstetric and Paediatric Mortality and Morbidity 2019, 'Victoria's mothers, babies and children report 2019', State Government of Victoria, Melbourne.

Creating Preferred Futures 2018, 'An analysis of the social costs of smoking in Victoria 2015–16', Creating Preferred Futures, Hobart.

Dempsey PC, Biddle SJH, Buman MP, Chastin S, Ekelund U, Friedenreich CM, Katzmarzyk PT, Leitzmann MF, Stamatakis E, van der Ploeg HP, Willumsen J, Bull F 2020, 'New global guidelines on sedentary behaviour and health for adults: broadening the behavioural targets'. Int J Behav Nutr Phys Act. 2020 Nov 26;17(1):151.

Department of Education and Training 2019, 'About You' Victorian Student Health and Wellbeing Survey, Summary Findings 2018, State Government of Victoria, Melbourne.

Department of Education and Training 2020, 'Victorian Child Health and Wellbeing Survey; summary of findings 2019', State of Victoria, Melbourne.

Department of Health 2014, 'Australia's physical activity and sedentary behaviour guidelines'. Canberra: Australian Government; 2014 (viewed 22 September 2022). Available from: <<https://www.health.gov.au/health-topics/physical-activity-and-exercise/physical-activity-and-exercise-guidelines-for-all-australians>>.

Department of Health 2017, '24-hour movement guidelines – birth to 5 years'. Canberra: Australian Government 2017 (viewed 28 September 2022) Available from: <<https://www.health.gov.au/resources/publications/24-hour-movement-guidelines-birth-to-5-years-brochure>>.

Department of Health 2019, '24-hour movement guidelines – children and young people' (5 to 17 years). Canberra: Australian Government 2019 (viewed September 2022) Available from: <<https://www.health.gov.au/resources/publications/24-hour-movement-guidelines-children-and-young-people-5-to-17-years-brochure>>.

Department of Health 2021, 'About physical activity and exercise'. Australian Government, Canberra. (viewed 22 September 2022). Available from: <<https://www.health.gov.au/health-topics/physical-activity-and-exercise/about-physical-activity-and-exercise>>.

Department of Health and Human Services 2018, 'Victorian Population Health Survey, 2017, Selected results, dashboard' (viewed 19 September 2022). Available from: <<http://www.health.vic.gov.au/population-health-systems/victorian-population-health-survey-2017>>.

Department of Health 2021, 'Better Health Channel, Exercise and mental health'. State of Victoria, Melbourne. (viewed 23 September 2022) Available from: <<https://www.betterhealth.vic.gov.au/health/healthyliving/exercise-and-mental-health>>.

Food and Mood Centre, Deakin University 2018 'Nutrition and diet infographic' (viewed 23 September 2022). Available from: <<https://foodandmoodcentre.com.au/2018/04/diet-and-nutrition-infographic/>>.

Jones L, Hashim A, McKeever T, Cook D, Britton J and Leonardi-Bee J 2011, 'Parental and household smoking and the increased risk of bronchitis, bronchiolitis and other lower respiratory infections in infancy: systematic review and meta-analysis', *Respiratory research*, vol. 12, no. 1.

National Health and Medical Research Council 2013, 'Australian dietary guidelines', National Health and Medical Research Council, Canberra.

Pedersen B and Saltin B 2015, 'Exercise as medicine: evidence for prescribing exercise as therapy in 26 different chronic diseases', *Scandinavian Journal of Medicine, Science and Sports*, vol. 25.

Victorian Agency for Health Information 2017, 'Challenges to healthy eating – food insecurity in Victoria: findings from the 2014 Victorian Population Health Survey', State of Victoria, Melbourne.



Victorian Agency for Health Information 2021,  
'Victorian Population Health Survey 2019:  
summary of results', State of Victoria, Melbourne.

Victorian Agency for Health Information 2021a,  
'Victorian Population Health Survey 2019:  
summary of results', State of Victoria, Melbourne.

Victorian Agency for Health Information  
2021b, 'Victorian Population Health Survey  
2019: dashboard' (viewed 23 September 2022).  
Available from: <[https://vahi.vic.gov.au/report/  
population-health/victorian-population-health-  
survey-2019-summary-results](https://vahi.vic.gov.au/report/population-health/victorian-population-health-survey-2019-summary-results)>.



# Chapter 10 – Maternal and infant health

Being born healthy is fundamental to Aboriginal babies having a strong start to life. For Aboriginal babies to have a greater chance of being born at a healthy birthweight, their mothers must be supported and healthy before and during pregnancy.

## Improving health outcomes for Aboriginal women and babies

Although the mortality rate for babies born to Aboriginal women has decreased in recent years, Aboriginal mothers and babies continue to have poorer outcomes than non-Aboriginal mothers and babies (DHHS, 2017).

A gap still exists between Aboriginal and non-Aboriginal women in two key areas: smoking during pregnancy and breastfeeding.

### Smoking during pregnancy

There are many risks associated with smoking during pregnancy, including miscarriage, early labour and growth, and developmental problems for babies.

Victorian 2019 data indicates that:

- 42.3 per cent of Aboriginal women smoked during pregnancy (up from 40.2 per cent in 2018) compared to 7.3 per cent of non-Aboriginal women.
- 11.3 per cent of Aboriginal women gave birth preterm (before 37 weeks) compared to 7.3 per cent of non-Aboriginal women.
- 11.7 per cent of babies born to Aboriginal women had low birthweight (< 2,500 grams) compared to 6.9 per cent of babies born to non-Aboriginal women.

Further effort is required to strengthen the effectiveness of smoking cessation programs available to Aboriginal mothers. This includes better promotion, accessibility, and affordability, as well as the cultural appropriateness of programs.

Any improvements in smoking rates will achieve better health outcomes for Aboriginal mothers and infants (DHHS, 2017).

See the 'Tobacco and vape-free living' section of 'Chapter 9 – Healthy living' for more information about smoking.

### Breastfeeding

Breastfeeding promotes and supports the healthy development and growth of infants (DHHS, 2017).

Breastfeeding is one of the most highly effective preventive measures a mother can take to protect the health of her infant and herself. It offers protection against several childhood health concerns, such as infections, diabetes, childhood obesity, and asthma.

Breastfeeding also contributes to better health outcomes for mothers and promotes opportunities for bonding between a mother and their baby.

Aboriginal women are less likely to initiate breastfeeding than non-Aboriginal women: 87 per cent compared with 94.6 per cent respectively (DHHS, 2017).



Aboriginal women are **less likely to initiate breastfeeding** than non-Aboriginal women (**87%** compared with **94.6%**)

In addition, the 2010 Australian National Infant Feeding Survey found the rates of Aboriginal infants exclusively breastfed (less than one month) was 59 per cent compared to 61 per cent for non-Aboriginal infants (AIHW, 2011).

The department is continuing to work to improve the health outcomes of all women and babies, including those from the Aboriginal community.

## Aboriginal led service delivery

### Koori Maternity Services

Koori Maternity Services (KMS) aim to increase access to earlier antenatal care, reduce smoking rates during pregnancy for Aboriginal women, reduce the proportion of Aboriginal babies born prematurely, and reduce the number of deaths of Aboriginal babies during pregnancy or soon after birth.

KMS has 14 sites across Victoria. It operates as an integral part of Victoria's maternity service system – offering flexible, person-centred care that is strengthened by Aboriginal culture and practice and built on respectful trusting relationships between women their families and KMS staff.

### Aboriginal Maternal Child Health

The objectives of Aboriginal Maternal Child Health (MCH) services are to improve access to and participation in the Universal MCH program and ensure the provision of its services are culturally responsive and flexible.

This flexible program includes the 10 Key Ages and Stages (KAS) consultations for Aboriginal mothers, families and children aged 0 to 5 years. Services are shaped around the needs of Aboriginal children and families rather than the requirements of existing system structures.

The success of MCH depends on the delivery of flexible and culturally responsive services through strong partnerships with maternal care providers and local Aboriginal communities.

## Find out more

The Better Health Channel's [pregnancy and smoking webpage](https://www.betterhealth.vic.gov.au/health/HealthyLiving/pregnancy-and-smoking) <<https://www.betterhealth.vic.gov.au/health/HealthyLiving/pregnancy-and-smoking>>.

The Better Health Channel's [breastfeeding webpage](https://www.betterhealth.vic.gov.au/health/healthyliving/breastfeeding) <<https://www.betterhealth.vic.gov.au/health/healthyliving/breastfeeding>>.

The Department of Health page [Aboriginal-maternity-services](https://www.health.vic.gov.au/patient-care/aboriginal-maternity-services) <<https://www.health.vic.gov.au/patient-care/aboriginal-maternity-services>>.

The Department of Health page [Aboriginal-led-mch-services](https://www.health.vic.gov.au/maternal-child-health/aboriginal-maternal-and-child-health-aboriginal-led-mch-services) <<https://www.health.vic.gov.au/maternal-child-health/aboriginal-maternal-and-child-health-aboriginal-led-mch-services>>.

## Safe sleeping of infants

It is vital for all parents, carers and service providers to ensure infants are safe when they sleep.

The need for state-wide safe infant sleeping guidance has been highlighted through recent coronial findings. They have called for consistent advice to be provided to parents regarding the practice of co-sleeping (sharing the same sleep surface).

Although the rates of sudden unexpected death in infants (SUDI) continue to decline in Australia, it remains a significant cause of death in infants under one year of age. In 2018, there were 93 deaths classified as SUDI in Australia. Those deaths included sudden infant death syndrome (SIDS) and fatal sleeping accidents (a rate of 0.3 deaths per 1,000 births).

The safest place for babies to sleep during the first 6 to 12 months of their life is in their own cot, located in the same room as an adult caregiver (DHHS, 2017).

Babies should also sleep in a lightweight sleeping bag of the correct size that has a fitted neck, armholes or sleeves and no hood (DHHS, 2017).

Factors that contribute to the risk of sudden unexpected death in infancy include:

- exposure to smoke (both before and after birth)
- sharing a bed with an adult (especially if the adult is affected by alcohol or drugs)
- an unsafe sleeping environment and/or position (Better Health Channel).

It is essential that all families – including parents, extended family, and other caregivers – receive clear and consistent information about safe sleeping and reducing the risk of SUDI. Parents should discuss safe sleeping before and after birth and to complete a safe sleeping checklist with their maternal child health nurse at home.

The risk of unexpected death during sleep in infants can be minimised by following safe sleeping guidelines, outlined in the [Better Health Channel](http://www.betterhealth.vic.gov.au/health/healthyliving/babies-and-safety) <<http://www.betterhealth.vic.gov.au/health/healthyliving/babies-and-safety>>.

## References

Australian Bureau of Statistics 2019, 'Causes of Death, Australia 2019'. ABS, Canberra. 2020 October. (viewed May 7, 2021).

Australian Institute of Health and Welfare 2011, 'Australian national infant feeding survey: indicator results', AIHW, Canberra.

Better Health Channel 2018, 'Pregnancy and smoking', State Government of Victoria, Melbourne.

Department of Health and Human Services 2017, 'Victoria's Mothers, Babies and Children 2016', State Government of Victoria, Melbourne.

Department of Health and Human Services 2017, 'Victoria's mothers, babies and children 2017', State Government of Victoria, Melbourne.

Department of Premier and Cabinet 2021, 'The Victorians Closing the Gap Implementation Plan 2021–2023', State Government of Victoria, Melbourne.

Safer Care Victoria 2019, 'Victoria's Mothers, babies and children 2019', State Government of Victoria, Melbourne.



# Chapter 11 – Child health

Childhood is a critically important period for healthy lifestyle development, learning, and establishing the foundations for future wellbeing.

Most Victorian children are healthy, well, and safe. However, by understanding and targeting risk factors in children at an early age, we can equip them with healthy habits and help prevent chronic disease in adulthood.

This chapter includes:

- Overweight and obesity in children
- Mental health and wellbeing
- Allergies in children.

## Overweight and obesity in children

Approximately one quarter of Australian children – some as young as two-years-old – are at an unhealthy weight (ABS, 2018).

Unhealthy weight can have short- and long-term effects on physical and mental health and wellbeing. It carries an increased risk of chronic diseases – such as diabetes, cardiovascular disease and cancer, and poor mental health – and a reduced life expectancy (Simmonds et al, 2016). Children with a major depressive disorder have also been found to be significantly more likely to be either underweight or obese (Department of Health, 2015).

Children with an unhealthy weight are at increased risk of adult obesity, with about 80 per cent of obese adolescents becoming obese adults (Simmonds et al, 2016).

As with many other health and wellbeing issues, overweight and obesity are more common in children living in more disadvantaged areas (AIHW, 2018).

There are several factors that can lead to increased likelihood of unhealthy weight in children.

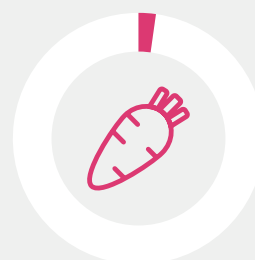
According to the World Health Organisation (WHO), there is clear evidence that children's exposure to unhealthy food marketing contributes to increasing rates of overweight and obesity in children (WHO, 2010).

The targeted promotion to children of unhealthy foods that offer little nutritional value, and are high in energy, salt, and fat, is a significant driver in encouraging children to want unhealthy foods (Nutrition Australia, 2017).

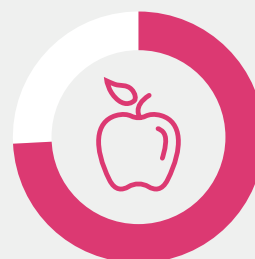
In 2019, only 2.4 per cent (approximately 1-in-40) of Victorian children were found to eat the recommended amount of vegetables, regardless of age or level of disadvantage. Three-quarters of Victorian children met the national minimum guidelines for fruit consumption, with children living in least disadvantaged areas being

For **children** aged between **4–12 years**:

**2.4%** met daily vegetable consumption minimum guidelines



**74.3%** met daily fruit consumption minimum guidelines



were more likely to be meeting the guidelines when compared with other areas (Department of Education and Training, 2020).

Physical activity is a key factor in maintaining healthy weight and reducing the risk of disease. It can also alleviate the severity of mental health issues, such as depression and anxiety (DET, 2020).

In 2019, the number of Victorian children who were active for an hour a day decreased to 52.2 per cent, down from 62.2 per cent in 2013 and 59.4 per cent in 2017 (DET, 2020).

Many of the actions that can be taken to prevent unhealthy weight – such as healthy eating, sustainable diets, walking, and cycling – have co-benefits because they also reduce emissions associated with climate change, as well as broader environmental impacts (Department of Health, 2019).

## Mental health and wellbeing

In 2019, analysis of the global burden disease database found that, over the past 30 years, there has been a substantial observed increase in the prevalence of mental health conditions – particularly anxiety, depression, and eating disorders such as anorexia nervosa and bulimia nervosa – among people under the age of 20. (Piao et al., 2022).

The most recent national mental health survey for children and young people was conducted in 2013–14. The 'Second Australian Child and Adolescent Survey of Mental Health and Wellbeing' found that 13.9 per cent of children aged 4 to 17 who were surveyed had experienced a mental disorder. The most common mental disorders were anxiety, depression, attention deficit hyperactivity (ADHD), and conduct disorder (Lawrence et al, 2015).

In 2018, the Victorian Student Health and Wellbeing Survey found that 20.4 per cent of students experienced psychological distress – an increase of 2.6 per cent from the previous survey in 2016. Conversely, 67.3 per cent of Victorian students reported high levels of psychological resilience. However, psychological resilience had decreased by 1.5 per cent from the 2016 survey (Department of Education and Training, 2019).

Climate change can impact mental health directly and indirectly. Increasingly, language such as ecological or climate anxiety, grief, and existential loss are being used to describe some of the impacts associated with the threat of climate change (Cunsolo et al, 2020; Gunasiri et al, 2022). The psychological effects of climate change can be significant for young Australians (Gunasiri et al, 2022; Sustainability Victoria, 2020a). Conversely, the mental health and wellbeing of children and young people can benefit from a connection to nature and participation in climate change and sustainability action (Gunasiri et al, 2022; Sustainability Victoria, 2020b).

In 2019, the Victorian Government launched the Mental Health in Schools program. The program supports the mental health and wellbeing needs of Victorian students by giving them access to services from mental health professionals as part of a school-based health and wellbeing team. The school-based health and wellbeing teams deliver prevention and early intervention activities, as well as more tailored and intensive support (Department of Premier and Cabinet, 2019).

### Find out more

The [State of Victoria's Children Report 2019](https://www.vic.gov.au/state-victorias-children-report) <<https://www.vic.gov.au/state-victorias-children-report>>, published by the Department of Education and Training in 2022.



## Allergies

The most sudden and severe form of an allergic reaction is anaphylaxis.

Anaphylaxis is a severe, potentially life-threatening allergic reaction that causes the immune system to release a flood of chemicals. Those chemicals can send people into shock; dropping their blood pressure, narrowing their airways, and impacting their ability to breathe. Medication, food, and insect venom are the three main causes of anaphylaxis.

Severe anaphylaxis is more common among children. For children aged 0 to 17, 72 per 100,000 population present to hospital with anaphylaxis in 2019, compared to 43 per 100,000 for adults (VAHI, 2019).

Hospital data shows a significantly increasing trend of Victorian children being affected by anaphylaxis over the past decade. In 2019, Victoria had 1,027 hospitalisations of children due to anaphylaxis, up from 298 in 2009.

The most common cause of anaphylaxis in children is food allergies, which is responsible for more than 81 per cent of hospital presentations (VAHI, 2019). In particular, there has been

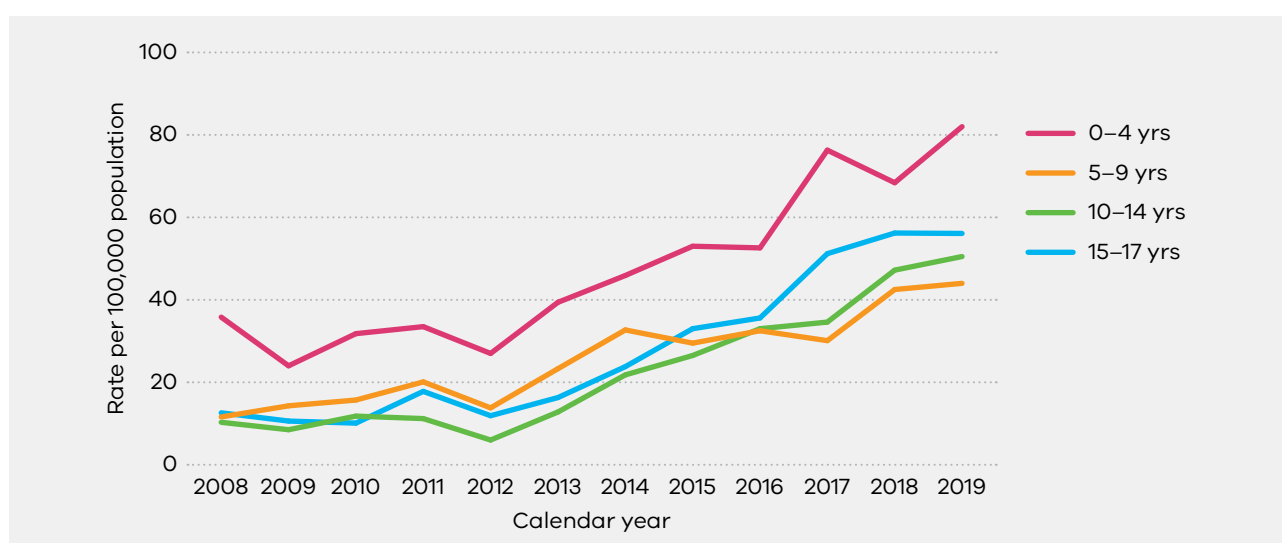


In 2019, there were **1,027** hospitalisations of Victorian **children** due to **anaphylaxis**, a dramatic **increase from 298** in 2009

concerning growth in food allergies among children aged 0 to 4. This age group has the highest rate of food reaction anaphylaxis.

Figure 1 shows that, for children of all age groups, the anaphylaxis rate per 100,000 population increased much faster than any other age group during the four years to 2019 (VAHI, 2019).

**Figure 1. Rate per 100,000 population for children of all age groups as paediatric anaphylaxis hospitalisations for food reactions 2008–2019 (VAHI, 2019)**



Peanut allergies – an allergy children rarely grow out of – are one of the most common childhood food allergies. A study conducted in Melbourne in 2011 found the prevalence of any sensitisation to peanut was 8.9 per cent in the paediatric population, with a 3 per cent prevalence of challenge-proven peanut allergies (Osborne et al, 2011) often associated with severe reactions and fatalities.

Methods for preventing peanut allergies require further research across population groups. In 2018–19, a Melbourne study identified that earlier peanut introduction (between the age of 6 to 12 months) was significantly linked with lower risk of peanut allergy among infants of Australian-born parents, but not among infants of East Asian ancestry (Soriano, 2022). Some research suggests that the timing of peanut introduction into an infant’s diet may influence the risk of allergic or autoimmune disease, but the evidence has not been comprehensively summarised.

## References

Australian Bureau of Statistics 2018, ‘National health survey 2017–18’, Australian Bureau of Statistics, Canberra.

Australian Institute of Health and Welfare 2014, ‘Suicide and hospitalised self-harm in Australia: trends and analysis, Injury research and statistics’, Australian Institute of Health and Welfare, Canberra.

Australian Institute of Health and Welfare 2018, ‘Data tables: children’s headline indicators’, Australian Institute of Health and Welfare, Canberra.

Centre for Suicide Prevention Studies 2010, ‘The Australian national epidemiological study of self-injury’, Centre for Suicide Prevention Studies, Brisbane.

Cunsolo A, Harper SL, Minor K, Hayes K, Williams KG, Howard C 2020, ‘Ecological grief and anxiety: the start of a healthy response to climate change?’ *Lancet Planetary Health*; 4(7):e261-e3.

Department of Education and Training, 2017, ‘The state of Victoria’s children 2016: why place matters’, State Government of Victoria, Melbourne.

Department of Education and Training 2019, ‘Victorian Student Health and Wellbeing Survey Summary Findings 2018’, State Government of Victoria, Melbourne.

Department of Education and Training 2020, ‘Victorian Child Health and Wellbeing Survey Summary Findings 2019’, State Government of Victoria, East Melbourne.

Department of Health 2015, ‘The mental health of children and adolescents: report on the second Australian Child and Adolescent Survey of Mental health and Wellbeing’, Commonwealth Government of Australia, Canberra.

Department of Health, 2019, 'Victorian Public Health and Wellbeing Plan 2019–2023', State of Victoria, Melbourne.

Department of Premier and Cabinet, 2019, 'Expanding Mental Health Support to Victorian Students.' (viewed 19 October 2022) from <<https://www.premier.vic.gov.au/expanding-mental-health-support-to-victorian-students-0>>.

Gunasiri, H.; Wang, Y.; Watkins, E.-M.; Capetola, T.; Henderson-Wilson, C.; Patrick, R. Hope 2022, 'Coping and Eco-Anxiety: Young People's Mental Health in a Climate-Impacted Australia'. *Int. J. Environ. Res. Public Health*, 19, 5528 <<https://doi.org/10.3390/ijerph19095528>>.

Hayes K, Blashki G, Wiseman J, Burke S, Reifels L 2018, 'Climate change and mental health: Risks, impacts and priority actions,' *International Journal of Mental Health Systems*; 12(1):28.

Lawrence D, Johnson S, Hafekost J, Boterhoven de Haan K, Sawyer M, Ainley J and Zubrick S, 2015. 'The mental health of children and adolescents: report on the second Australian Child and Adolescent Survey of Mental Health and Wellbeing', Commonwealth Government of Australia, Canberra.

Nutrition Australia 2017, 'Tipping the scales: we must halt obesity to save Australian lives', Nutrition Australia.

Osborne N.J., Koplin J.J., Martin P.E., Gurrin L.C., Lowe A.J., Matheson M.C. et al, 2011. 'Prevalence of challenge-proven IgE-mediated food allergy using population-based sampling and predetermined challenge criteria in infants'. *J Allergy Clin Immunol*; 127 (e1–2): 668–676.

Piao J, Huang, Y, Han C, Li Y, Xu Y, Liu Y and He X, 2022. 'Alarming changes in the global burden of mental disorders in children and adolescents from 1990 to 2019: a systematic analysis for the Global Burden of Disease study,' *European Journal of Child & Adolescent Psychiatry*, pp. 1–19.

Simmonds M, Llewellyn A, Owen C and Woolacott N 2016, 'Predicting adult obesity from childhood obesity: a systematic review and meta-analysis', *Obesity Reviews*, vol. 174, no. 2, pp. 95–107.

Sustainability Victoria 2020a, 'Linking Climate Change and Health Impacts, Social Research Exploring Awareness among Victorians and our Healthcare Professionals of the Health Effects of Climate Change' State Government of Victoria, Melbourne.

Sustainability Victoria 2020b, 'ResourceSmart Schools and wellbeing main study: Exploring student wellbeing impacts of the ResourceSmart Schools program', State of Victoria, Melbourne.

Soriano V, Peters R, Moreno-Betancur, M, Ponsonby A, Gell G, Odoi A, Perrett K, Tang M, PhD; Gurrin T, Allen KJ, Dharmage and S, Koplin J 2022, 'Association Between Earlier Introduction of Peanut and Prevalence of Peanut Allergy in Infants in Australia,' *JAMA*; 328(1):48–56. Doi:10.1001/jama.2022.9224.

Victorian Injury Surveillance Unit 2017, Hazard, Monash University Accident Research Centre, Melbourne.

World Health Organization 2010, 'Recommendations on the marketing of foods and non-alcoholic beverages to children', World Health Organization, Geneva.



# Chapter 12 – Communicable diseases

This section of *Your health* highlights some of the improved ways the department is undertaking surveillance of communicable disease.

It also examines key topics that had a significant impact on communicable disease experience in Victoria in 2019 – antimicrobial resistance, Buruli (Bairnsdale) ulcers, seasonal influenza, measles, and syphilis.

## Antimicrobial resistance

Antimicrobials are medicines that kill or attack infection-causing germs such as viruses, bacteria, parasites, and fungi. Over the past century, antimicrobials – especially antibiotics – have been a vital tool in treating infections in humans and animals and improving health outcomes.

Antimicrobial resistance (AMR) occurs when the organisms that cause infections develop defences against these medicines. As a result of AMR, antimicrobials medicines are less effective at stopping infections.

AMR has become a major factor in limiting the effectiveness of antimicrobials and is jeopardising health outcomes. If not effectively addressed, will make the fight against infections much harder.

The World Health Organization recognises that AMR ‘poses a profound threat to human health’, and ‘threatens the very core of modern medicine and the sustainability of an effective global public health response to the enduring threat from infectious diseases’ (WHO, 2015).

Globally, about 700,000 people a year die from infections caused by antimicrobial-resistant pathogens. Without interventions, it is estimated that the associated death toll from AMR will increase to 10 million a year by 2050 (HM Government and Wellcome Trust, 2016).

Globally, **700,000 people die** annually from infections caused by **antimicrobial resistant pathogens**.

This number could reach 10 million annually by 2050 without intervention.



Approximately 290 deaths each year in Australia are due to infections from eight resistant bacteria. Between 2015 and 2050, it is estimated that a total of 10,430 people will die due to AMR (OECD 2018).

Victorian health services are already affected by AMR. The importation of resistant organisms from overseas and local transmission have caused an increasing number of outbreaks in hospitals and aged care facilities, disrupting care and resulting in significant economic costs.

In Victoria, the department leads the public health response to AMR. The public health response includes surveillance and outbreak response, as well as developing guidelines and engaging with stakeholders. The department has developed guidelines for two highly resistant microorganisms that spread within and between healthcare facilities, along with AMR response procedures for notifiable diseases identified in community settings.

The Victorian guideline on carbapenemase-producing enterobacteriales for health services, was developed for Victoria in 2015 and updated in 2018 following an outbreak of *klebsiella pneumoniae* within a metropolitan healthcare facility (DHHS, 2018).

In 2019, there were nine outbreaks of carbapenemase-producing enterobacteriales detected in Victorian hospitals and long-term residential care facilities.



**9 outbreaks** of carbapenemase-producing enterobacteriales were detected in Victorian hospitals and residential care facilities in 2019

*Candida auris* is a yeast species first isolated in Japan in 2009. *Candida auris* is often resistant to common antifungal medicines and can spread in hospitals and aged care facilities. In 2019, it was made a notifiable condition in Victoria. Also in 2019, the department – together with health services, laboratories, infection prevention and control, and infectious disease experts – developed and published the first Victorian Guidelines on *Candida Auris* for health services.

Climate change, population growth, international travel, and the global economy are all intertwined – and are amplifying the consequences of AMR and communicable disease threats. Antibiotic overuse and misuse – together with the detection of resistant organisms in the animal, food production and environment sectors – have the potential to cause significant economic loss and ultimately affect human and animal health.

A cross-sector approach is needed to respond to AMR and minimise the impacts on the Victorian community. That is why the department, in conjunction with Agriculture Victoria, the Environmental Protection Authority and sector representatives, is developing a 10-year Victorian strategy to address AMR.

## Buruli Ulcer

Classified by the World Health Organisation as a neglected tropical disease, Buruli ulcer (also known as Bairnsdale or Daintree ulcer) is an infection of skin and soft tissue caused by the environmental pathogen *mycobacterium ulcerans*. Although generally not fatal, Buruli ulcer can result in long-term cosmetic and functional deformity if effective treatment is unavailable or delayed. Early recognition, diagnosis and treatment with antibiotics can minimise the progression of symptoms.

A geographically-restricted disease, Buruli ulcer has been reported in 33 countries in Africa, the Americas, Asia and Western Pacific. Most cases occur in tropical and subtropical regions, except Australia, China, and Japan.

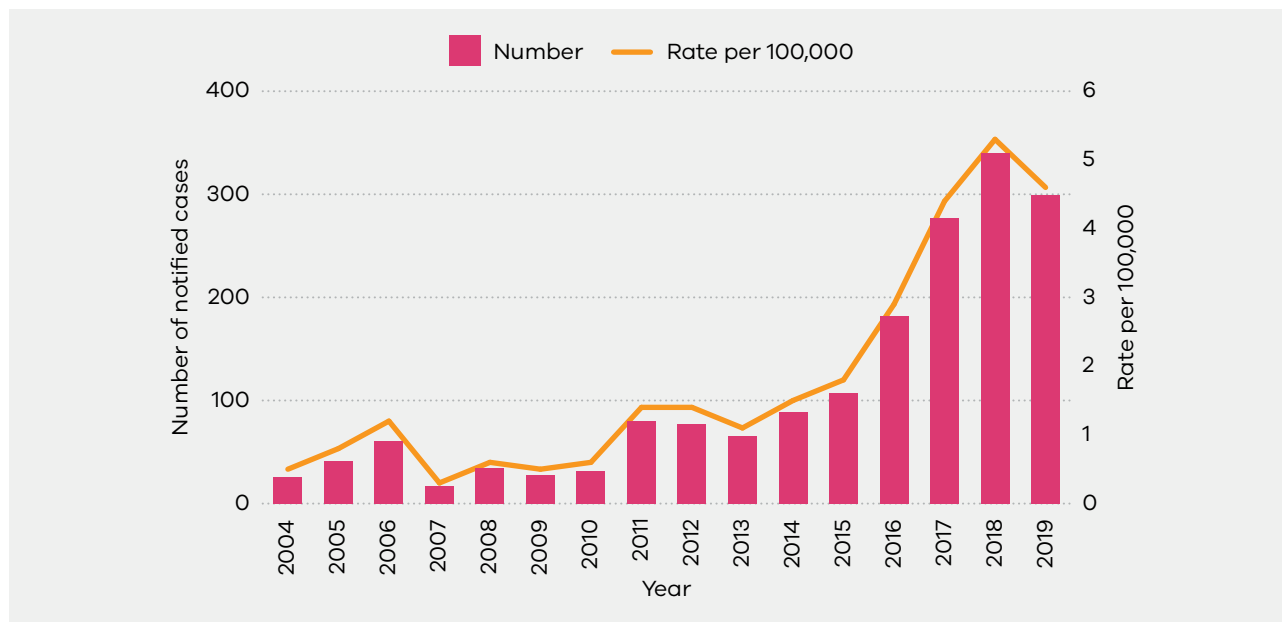
In Australia, the majority of Buruli ulcer cases occur in Victoria. In Victoria, Buruli ulcer was first reported in East Gippsland in the 1930s before appearing in Philip Island, Westernport region and many coastal areas around Port Philip Bay – including Frankston, the Bellarine peninsula, and, more recently, the Mornington Peninsula and the southeast bayside suburbs of Melbourne.

Since becoming notifiable in 2004, there was a significant increase in case numbers. Buruli ulcer notifications exceeded 100 cases for the first time in 2015, reaching a peak of 340 cases in 2018. In 2019, Victoria continued to experience high number of cases, with 299 cases notified (rate 4.6 per 100,000).



**299** cases of Buruli ulcer notified in 2019

**Figure 1. Notifications of Buruli ulcer by year, 2004–2019**



Source: Department of Health

In addition to high case numbers, Victoria’s endemic areas also expanded to Aireys Inlet on the Surf Coast and the Geelong suburb of Belmont in 2019.

The transmission of Buruli ulcer is not fully understood. In Victoria, possums may be an important reservoir of Buruli ulcer, as the bacteria can be isolated from possum faeces in high-risk areas, while mosquitoes play a role in transmitting the disease to humans. Buruli ulcer is not spread person to person.

### Responding to the disease

The department is partnering in a large research project to investigate how Buruli ulcer is transmitted and identify effective ways to prevent and reduce infections.

The Beating Buruli in Victoria project commenced in 2018. The department developed the project in partnership with the Doherty Institute, Barwon Health, Austin Health, Agriculture Victoria, the University of Melbourne, and the Mornington Peninsula Shire. Research is ongoing and findings will be used to inform future policies and public health interventions to stop the rise and spread of disease.

To find out more, see [Beating Buruli in Victoria project](https://www.health.vic.gov.au/infectious-diseases/beating-buruli-in-victoria) <<https://www.health.vic.gov.au/infectious-diseases/beating-buruli-in-victoria>>.

## Seasonal influenza

In 2019, the prolonged influenza season resulted in sustained demand for health services throughout Victoria between April–October 2019. Increased numbers of people presented to health services with influenza-like illness (ILI), with emergency department presentations and hospital admissions peaking in July.

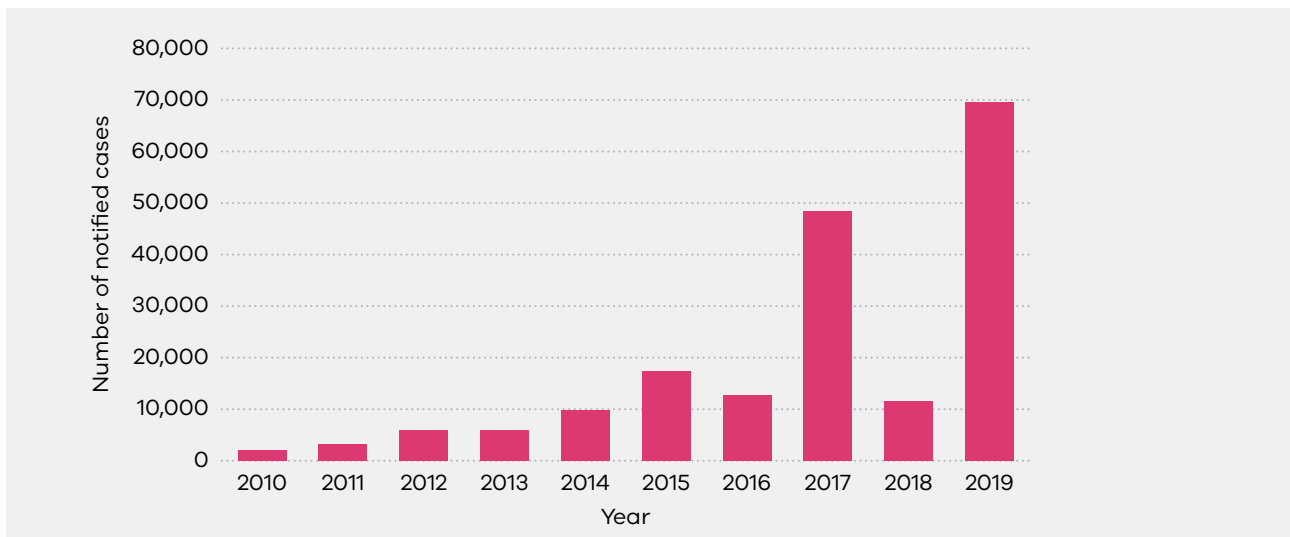
The very young and the very old were particularly affected by ILI. Most children hospitalised with influenza were aged under

five years. A record number of respiratory outbreaks due to influenza were also reported in residential aged care facilities.

Figure 2 shows that in 2019 there were 69,599 laboratory-confirmed cases of influenza notified to the department – a higher total than 2017 and 3.9 times higher than the five-year average for 2014–2018.

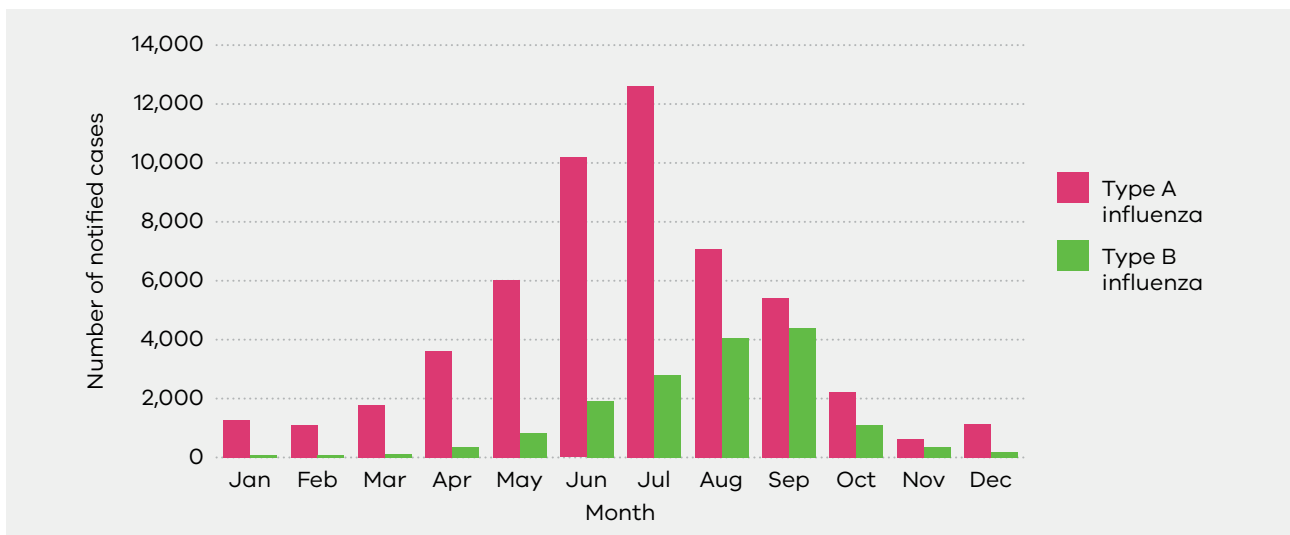
Figure 3 shows that the number of influenza notifications began to rise in late-March, peaked in mid-July, and did not fall to inter-

**Figure 2. Notifications of laboratory-confirmed influenza by year, Victoria 2010–2019**



Source: Department of Health

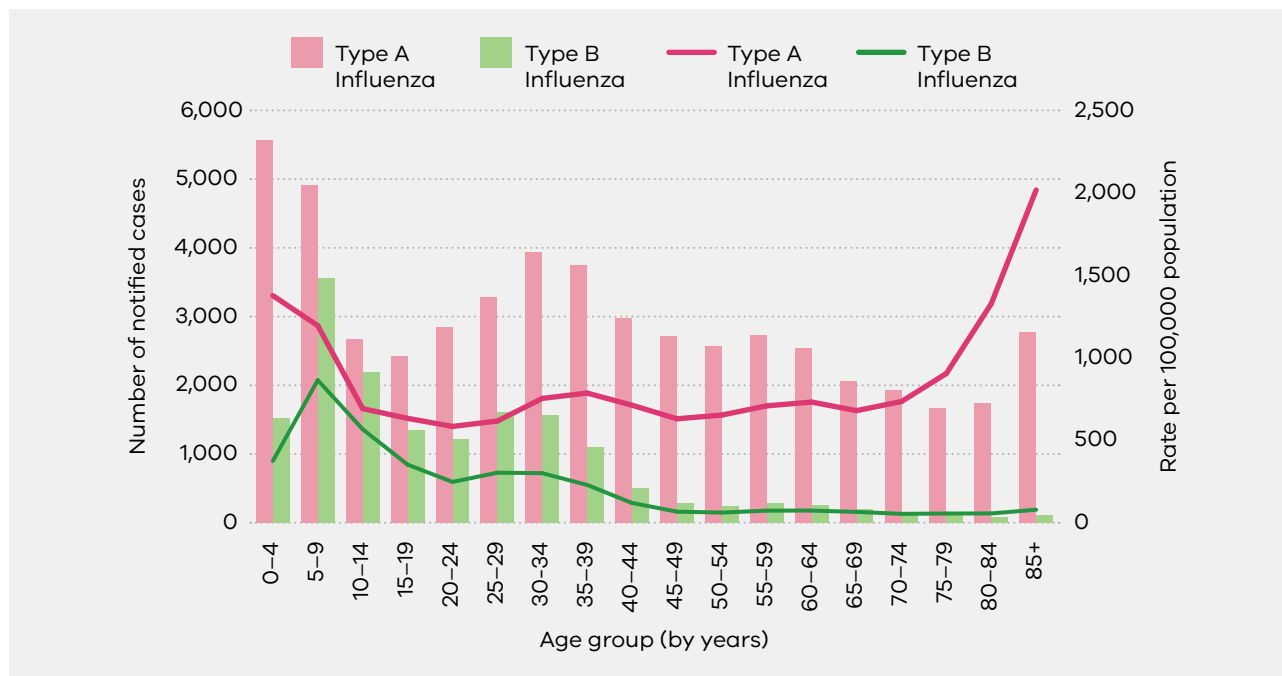
**Figure 3. Notifications of laboratory-confirmed influenza by month and type, Victoria 2019**



Source: Department of Health



**Figure 4. Notifications of laboratory-confirmed influenza by age group and type, Victoria 2019**



Source: Department of Health

seasonal levels until late November. Laboratory testing indicated there was an early peak of influenza type A, followed by a smaller peak of influenza type B.

Figure 4 shows that the influenza types affected different age groups. The highest rates of type A influenza were for people under five years of age and those aged 75 years and older. Type B was most common in people aged five to nine years old.

### Hospitalisations and deaths

Data from the Influenza Complications Alert Network (FluCAN) indicated decreased severity of influenza infections nationally in 2019 compared with 2017. There were a lower

percentage of laboratory-confirmed influenza cases admitted directly to ICU, but higher numbers of hospitalised cases across Australia.

In Victoria, there were 12,122 influenza-related hospital admissions in 2019, with almost half (49 per cent) aged ≥65 years, and 7 per cent aged <5 years.

The Australian Bureau of Statistics reported 1,135 deaths in Victoria due to influenza and pneumonia in 2019, which was slightly lower than the 1,161 deaths reported for 2017.

### Influenza prevention

The National Immunisation Program (NIP) includes free vaccination for groups known to be vulnerable to severe influenza infection.

Those groups include:

- people with underlying medical conditions
- Aboriginal and Torres Strait Islander peoples
- those aged 65 years and older
- those who are pregnant.



2019 saw **12,122** influenza-related hospital admissions in Victoria

To help provide further community protection, in 2019 the Victorian Government continued an additional vaccination program for children aged between six months and five years.

In addition, from May 2018 Australian Government-subsidised aged care providers were required to offer free influenza vaccination to all staff and volunteers.

### **Vaccine effectiveness**

Findings from the World Health Organization Collaborating Centre for Reference and Research on Influenza indicated moderate effectiveness of the influenza vaccine used in 2019.

Based on national data, vaccinated individuals were 46 per cent less likely to present to a general practitioner (GP) with an influenza-like illness (ILI) and test positive for influenza and 43 per cent less likely to be hospitalised due to influenza, compared to unvaccinated individuals.

The Influenza A strains contained within the vaccine were replaced for the 2020 southern hemisphere influenza season.

The prolonged influenza season in 2019 placed pressure on all areas of the Victorian health system.

Future enhancements to influenza data collection and linkage with hospitalisation and mortality datasets will be integral to ensuring early warning, appropriate planning and action for future influenza seasons.

## **Measles**

In Victoria, there were 57 notified measles cases in 2019 – the most since 2014.

The increase in local measles cases coincided with a global rise in measles – with international cases and deaths at their highest level in 23 years (Patel et al, 2020). All Victorian cases were either acquired overseas or could be linked back to measles cases who had travelled overseas.

Two large measles clusters accounted for many of the infections.

One cluster had 11 cases, with the index case a traveller from Vietnam who attended several social functions (whilst unknowingly infectious) during his stay in Victoria.

The other cluster of eight measles cases was among seasonal agricultural workers from Samoa. In late 2019, Samoa experienced a large measles outbreak with many cases and deaths, especially among young children.

The ages of the Victorian measles cases in 2019 ranged from 10 months to 54 years, with a median of 28 years. Of those aged over 12 months, nine were not vaccinated. Another nine cases had only received a single dose of the measles vaccine.

For most adult cases, their vaccination status was unable to be determined.

Measles-Mumps-Rubella (MMR) vaccine is free for all adults born during or since 1966 without documented evidence of their vaccine status. Two doses spaced by a minimum of 4 weeks is recommended.

MMR vaccine is contraindicated for pregnant women and people who are immunosuppressed.

## Syphilis

In 2019, there was a continued surge in cases of infectious syphilis in the Mildura Local Government Area (LGA), with 28 cases notified. There is a trend of increasing syphilis notifications across Victoria, however, the rate of infection in Mildura LGA (per 100,000 population) was twice the state-wide average. Case numbers in Mildura LGA began to rise in 2017, prior to which there had been an average of fewer than two cases notified per year since 2007.

Of the 28 cases notified in Mildura LGA in 2019, the majority were female, and all were of reproductive age (15–49 years). This contrasted with trends across the rest of Victoria, where males represented the overwhelming majority of notified infections.

Several key public health actions were taken in response to the increased cases in the Mildura area, including:

- communication with local healthcare providers and the Primary Health Network
- workforce education and support
- public communications promoting syphilis awareness, prevention, testing, and treatment.

Syphilis is a sexually transmissible infection caused by the bacterium *treponema pallidum*. Syphilis is curable, but, if untreated, can lead to serious complications. Syphilis during pregnancy can cause miscarriage, birth defects, and still births. Regular testing, early treatment, partner management, and practicing safe sex reduces the risk of acquiring and spreading syphilis.

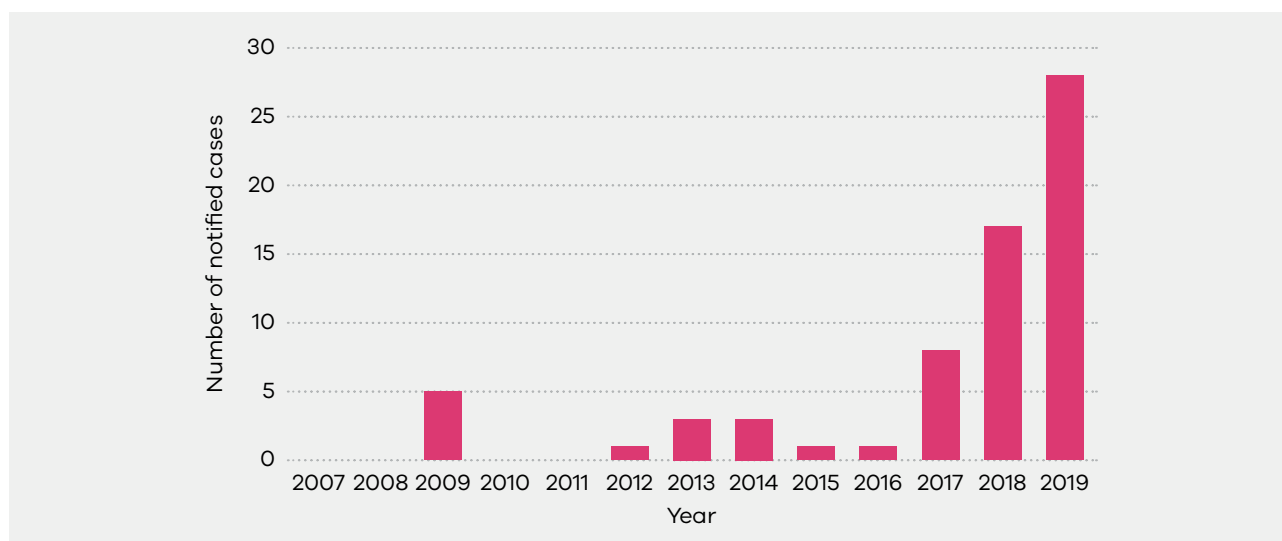
## Improved processes and reporting for notifiable conditions

Globally, infectious diseases and other conditions of public health concern occur frequently and require constant vigilance to minimise their spread.

Notification is a vital step in efforts to enable public health action to control the spread of infection and prevent further harmful exposures.

Medical practitioners and pathology services continue to play a vital role in protecting public health by notifying cases of specific infectious diseases and other medical conditions to the Department of Health. This notification is required under by the *Public Health and Wellbeing Act 2008*.

**Figure 5. Number of notified infectious syphilis cases in Mildura LGA in 2019**



Notification under the Act:

- provides a crucial early warning of potential threats to public health
- enables the department to respond to prevent or control the spread of disease
- allows for the identification of emerging trends and the implementation of appropriate policy responses and public health interventions.

In 2019, the department began the gradual implementation of electronic reporting of test results for pathology services. The purpose of this reform is to enable prompt notification, as well as more timely surveillance and monitoring. Electronic notifications will simplify the notification process for pathology services to fulfil legal requirements to notify positive pathology results to the department.

The department has continued to develop secure online reporting of notifiable conditions for medical practitioners. The online forms now capture more detailed, disease specific information at the time on initial notification, which supports earlier response and interventions.

Further details on notifiable conditions and links to notify are available on the [department's website](https://health.vic.gov.au/notify) <[health.vic.gov.au/notify](https://health.vic.gov.au/notify)>.

Prior to 2019, the department's Health Protection Branch had produced more than 200 daily reports on notifiable conditions for almost 20 years. These daily reports provided surveillance data on communicable diseases and other conditions notifiable under public health and wellbeing legislation at state-wide and local government levels.

During 2019, the branch fully transitioned from the 200 fixed PDF and Excel reports to the new interactive reporting platform powered by Microsoft's Power BI platform.

This new platform allows the branch to publish content directly to the web more efficiently. In addition, the data is more interactive.

The reports have enhanced the user experience for health sector and local government workers, as well as researchers and students.

Visit the [interactive communicable disease reports webpage](https://www.health.vic.gov.au/infectious-diseases/interactive-infectious-disease-reports) <<https://www.health.vic.gov.au/infectious-diseases/interactive-infectious-disease-reports>>.

## References

Australian Bureau of Statistics 2020 3303.0 Causes of Death, Victoria, 2019.

Australian Sentinel Practitioners Research Network (ASPREN) <<https://aspren.dmac.adelaide.edu.au/>>.

Carson C, Lavender C, Handasyde K, O'Brien C, Hewitt N and Johnson P 2014, 'Potential wildlife sentinels for monitoring the endemic spread of human Buruli ulcer in South-East Australia'. *PLoS Negl Trop Dis.*; 8 (1): e2668.

Cheng AC, Dwyer DE, Holmes M, Irving L, Simpson G, Senenayake S, Korman T, Friedman ND, Cooley L, Wark P, Holwell A, Bowler S, Upham J, Fatovich DM, Waterer G, Blyth CC, Crawford N, Buttery J, Marshall HS, Clark JE, Francis J, Macartney K, Kotsimbos T, Kelly P 2018, 'Influenza epidemiology in patients admitted to sentinel Australian hospitals in 2019: the Influenza Complications Alert Network' (FluCAN). *Communicable Diseases Intelligence*. 2022 Apr 26;46. doi: 10.33321/cdi.2022.46.14. PMID: 35469560.

Fyfe J, Lavender C, Handasyde K, Legione A, O'Brien C and Stinear T, 2010 'A major role for mammals in the ecology of *Mycobacterium ulcerans*'. *PLoS Negl Trop Dis.*; 4(8): e791.

HM Government and Wellcome Trust 2016, The Review on Antimicrobial Resistance. Tracking drug-resistant infections globally: final report and recommendations, London. Available at: <<https://amr-review.org/Publications.html>>.

Johnson P, Azuolas J, Lavender C, Wishart E, Stinear T and Hayman J, 2007 'Mycobacterium ulcerans in mosquitoes captured during outbreak of Buruli ulcer', South-Eastern Australia. Emerging Infectious Diseases. Nov; 13(11).

Johnson P, Veitch M, Leslie D, Flood P and Hayman J (1996), 'The emergence of Mycobacterium ulcerans infection near Melbourne'. MJA. 164.

Lavender C, Fyfe J, Azuolas J, Brown K, Evans R and Ray L 2011, 'Risk of Buruli ulcer and detection of Mycobacterium ulcerans in mosquitoes in South-Eastern Australia'. PLoS Negl Trop Dis; 5(9): e1305.

O'Brien, Wynne JW, Buultjens AH, Michalski WP, Stinear TP, Friedman ND, Hughes A, Athan E 2017, 'Exposure Risk for Infection and the Lack of Human-to-Human Transmission of Mycobacterium ulcerans Disease, Australia'. Emerging Infectious Diseases. May; 23(5).

OECD 2018, Stemming the superbug tide: just a few dollars more, OECD Health Policy Studies, OECD Publishing, Paris. Available at: <[https://www.oecd-ilibrary.org/social-issues-migration-health/stemming-the-superbug-tide\\_9789264307599-en](https://www.oecd-ilibrary.org/social-issues-migration-health/stemming-the-superbug-tide_9789264307599-en)>.

Patel MK, Goodson JL, Alexander JP Jr., et al 2020, 'Progress Toward Regional Measles Elimination — Worldwide 2000–2019'. MMWR Morb Mortal Wkly Rep; 69:1700–1705. DOI: <<http://dx.doi.org/10.15585/mmwr.mm6945a6>>.

Quek T, Athan E, Henry M, Pasco J, Redden-Hoare J and Hughes A 2007, 'Risk factors for Mycobacterium ulcerans infection, South-Eastern Australia'. Emerging Infectious Diseases.; 13 (11).

Wallace J, Mangas K, Porter J, Marcsisin R, Pidot S and Howden B 2017, 'Mycobacterium ulcerans low infectious dose and mechanical transmission support insect bites and puncturing injuries in the spread of Buruli ulcer'. PLoS Negl Trop Dis.; 11 (4): e0005553.

World Health Organisation 2022. Buruli Ulcer (Mycobacterium ulcerans infection). Available at: <[https://www.who.int/health-topics/buruli-ulcer#tab=tab\\_1](https://www.who.int/health-topics/buruli-ulcer#tab=tab_1)>.

World Health Organization 2015, Global action plan on antimicrobial resistance, WHO, Geneva. Available at: <[https://cdn.who.int/media/docs/default-source/antimicrobial-resistance/iacg-amr-national-action-plans-110618.pdf?sfvrsn=53e4eb22\\_4#:~:text=In%202015%2C%20the%20WHA%20adopted%20the%20Global%20Action,action%20plan%20%28NAP%29%20aligned%20with%20the%20GAP%20objectives](https://cdn.who.int/media/docs/default-source/antimicrobial-resistance/iacg-amr-national-action-plans-110618.pdf?sfvrsn=53e4eb22_4#:~:text=In%202015%2C%20the%20WHA%20adopted%20the%20Global%20Action,action%20plan%20%28NAP%29%20aligned%20with%20the%20GAP%20objectives)>.

World Health Organisation 2022. Neglected Tropical Diseases. Available at: <[https://www.who.int/health-topics/neglected-tropical-diseases#tab=tab\\_1](https://www.who.int/health-topics/neglected-tropical-diseases#tab=tab_1)>.

World Health Organization 2022. Syphilis. Available at: <[https://www.who.int/health-topics/syphilis#tab=tab\\_1](https://www.who.int/health-topics/syphilis#tab=tab_1)>.



# Chapter 13 – Immunisation

Immunisation prevents many illnesses in children and adults.

It provides benefits not only for individuals but also for the health of the wider community. When enough people are immunised, disease spread is reduced.

One of the key priorities of the National Immunisation Strategy for Australia 2019–2024 is to improve immunisation coverage. This includes strategies to facilitate access to immunisation services for all Australians, regardless of financial or geographical barriers.

This section of the *Your health* provides information on:

- vaccination coverage in Victoria
- services available to support Victorians who require highly individualised assessment and additional care to receive vaccinations, including high-risk or vulnerable individuals
- how adverse events from immunisations are tracked and reported
- immunisation services available to asylum seeker and refugees.

## Vaccination coverage in Victoria

### National Immunisation Program

The National Immunisation Program (NIP) schedule is a series of immunisations given at specific times throughout a person's life. The immunisations range from birth through to adulthood. Victoria has a schedule of vaccines provided free under the NIP and Victorian immunisation programs (Victorian Department of Health, 2019).

These vaccines are free for children, adolescents, and adults at scheduled ages. Additional vaccines are recommended for people with increased risk factors, and catch-up vaccines are free for certain groups of people (such as refugees and asylum seekers).

Vaccines on the NIP provide protection from the following diseases:

- Hepatitis B
- Diphtheria
- Tetanus
- Poliomyelitis
- Pertussis (whooping cough)
- Haemophilus influenzae type B
- Pneumococcal disease
- Meningococcal B
- Influenza
- Tuberculosis
- Measles
- Mumps
- Rubella
- Meningococcal ACWY
- Varicella (chickenpox)
- Human Papillomavirus
- Herpes zoster (shingles).

### National Immunisation Strategy and the National Partnership Agreement on Essential Medicines

The 2019–2024 National Immunisation Strategy for Australia, published in 2019, identifies eight strategic priorities, including improving immunisation coverage (Australian Government Department of Health, 2018).

The Immunisation Unit of the department has aligned its strategic priorities with the Commonwealth. Those priorities are to: maintain and/or improve immunisation coverage rates for federal- and state-funded vaccines;

and protect as many Victorians as possible, including vulnerable Victorians, from vaccine-preventable disease.

Consistent with the WHO target for the western Pacific region, Australian governments have agreed to a target of 95 per cent immunisation coverage for children aged one, two and five years by 2020. This target is reflected in the second National Partnership Agreement on Essential Vaccines (NPEV).

Under the NPEV, the Victorian Government and other states and territories have committed to improve vaccination coverage rates among five-year-old children (including Aboriginal and Torres Strait Islander children) to the target of 95 per cent (Australian Government Department of Health, 2018).

### Victoria maintains high vaccination coverage in children

Comparison of vaccination coverage of Victorian children at ages one, two and five years over time shows that Victoria has achieved high vaccination rates – and those vaccination rates continue to climb.

Between 2016–2017, there was a slight decline in vaccination rates for two-year-old Victorians. This decline was attributed to changes to the definition of fully immunised for measuring coverage rates in previous years, causing a temporary lag in coverage, as well as 2017 changes to diphtheria, tetanus and pertussis dose reporting in this age cohort.

Vaccination rates climbed between 2018–2019, following this decline.

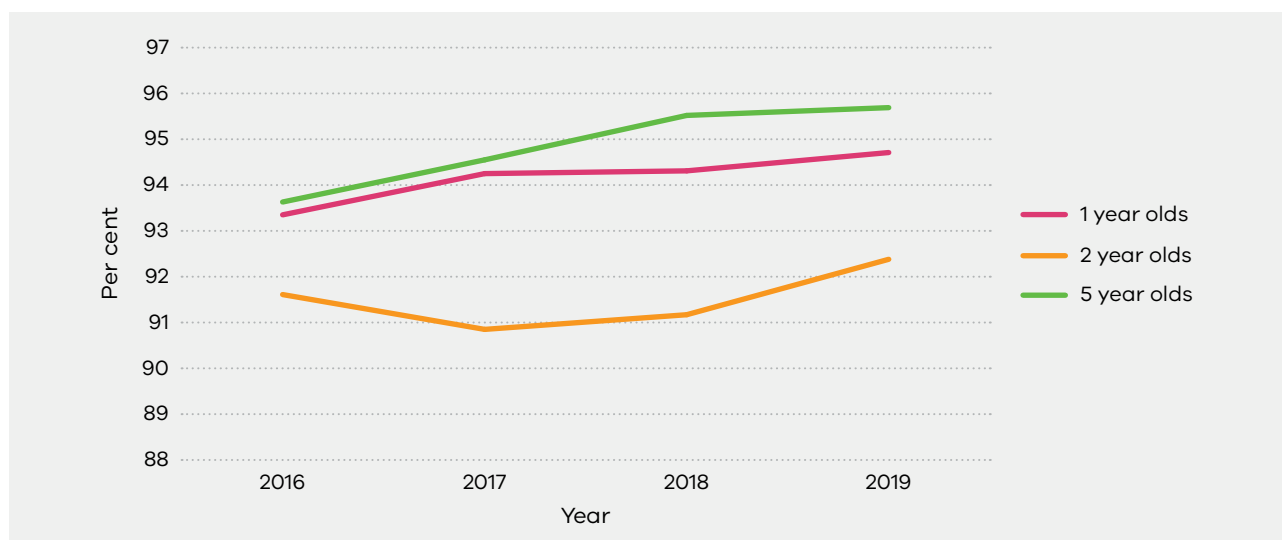
In 2019, 95.69 per cent of Victorian children were up to date with their vaccinations by age five, meeting the NPEV target. Work will continue to maintain this high vaccination coverage rate (Australian Government Department of Health, 2018).



In 2019, **95.69%** of Victorian **children up to age 5** were **up to date** with their **vaccinations**

### Vaccination rates for Victorian children aged 1, 2 and 5 years

Figure 1. Comparison of current childhood vaccination coverage with previous years





A review of the No Jab No Play legislation (introduced in 2016) is planned for 2020, to investigate its effects on childcare aged children and make further recommendations for improving vaccination coverage under the NIP for childcare-aged children.

## Maintaining safe and accessible vaccination services

### Hospital-based immunisation services

The Victorian Government is committed to ensuring the NIP is accessible to all Victorians and continues to support strategies designed to increase vaccination rates in high-risk groups through targeted initiatives.

In line with this commitment, the department provides funding for specialist immunisation services at three Victorian Hospitals:

- Sunshine Hospital
- Royal Children's Hospital (RCH)
- Monash Medical Centre.

These services provide comprehensive support to Victorians who require highly individualised assessment and support to receive vaccinations appropriate for their age.

Key aspects of these services include:

- Dedicated immunisation telephone advice services. These services support health professionals and members of the public.
- In-reach vaccination models targeting vaccination of Victoria's most vulnerable populations. Those vulnerable populations include neonates and young children, Aboriginal and Torres Strait Islander people, oncology patients, and pregnant people. These models include promotion of appropriate maternal vaccinations and Hepatitis B vaccine birth doses.

- Specialist immunisation clinics. These clinics support: Victorians after previous adverse reactions to immunisation, those at high-risk of adverse reaction to a vaccine or vaccines, those with underlying complex medical conditions, those with vaccine hesitancy, and people whose needs are unable to be met in a traditional vaccination setting.
- Assessments at the RCH of children for medical and special risk exemptions under the 'No Jab No Play and No Jab No Pay' policies.
- Provision of clinical immunisation education to health professionals to support immunisation services.

Quarterly reports provided from each of the specialist immunisation services have shown an increase in vaccination coverage in targeted high-risk groups.

### Adverse event management and reporting

Surveillance of Adverse Events Following Vaccination In the Community (SAEFVIC) is a public health partnership initiative of the Victorian Immunisation Program funded by the department. SAEFVIC is a specialist vaccine safety service that helps immunisation providers report and manage children and adults who have had an adverse event following immunisation.

Victoria is responsible for coordinating local monitoring and surveillance of adverse events following immunisation and reporting them to the Commonwealth under the NPEV.

SAEFVIC was established in 2007 and now comprises two units:

- Clinical and surveillance
- Epidemiology and signal investigation.

SAEFVIC is based at the Murdoch Children's Research Institute and has a dedicated outpatient clinic at the RCH. It also provides regional clinical support via telehealth (Murdoch Children's Research Centre). The SAEFVIC team includes immunisation nurses, administrative and research staff, epidemiologists, statisticians, data managers, and clinicians.

## Refugee and asylum seeker vaccination programs

In recognition of the difficulties many refugees and asylum seekers experience in accessing medical care, the 2016–17 State Budget provided an additional \$10.9 million over four years to support the increasing number of refugees settling in Victoria (DHHS, 2016).

Of this funding, more than \$2.3 million was set aside to help refugees and asylum seekers in Victoria complete vaccine schedules according to Australian recommendations (DHHS, 2016).

This funding supported the establishment of the Program for Refugee Immunisation Monitoring and Education (PRIME).

### Program for Refugee Immunisation Monitoring and Education

PRIME has four participating vaccination sites, with oversight from the Immunisation Unit at the department and an Evaluation Reference Group (ERG). The four sites are the:

- City of Greater Dandenong
- City of Whittlesea and Hume
- Asylum Seeker Resource Centre
- Cabrini Asylum Seeker and Refugee Health Hub.

### Key aspects of PRIME include:

- Developing and maintaining referral pathways between settlement providers and immunisation services in primary care and local government areas and within asylum seeker agencies.
- Community education and engagement. This engagement is carried out through community liaison officers, community education, outreach, word of mouth, and project delivery within trusted services.
- Provider engagement. This is achieved through liaison, outreach, and technical support for primary care providers.
- Expanding service provision. This is delivered through targeted sessions, opportunistic immunisation aligned with other systems, and home visiting programs.
- New systems to enable the tracking and follow-up required to ensure completion of catch-up vaccination.

### Outcomes of PRIME

Program data collected by partner organisations indicates that 14.7 per cent of refugees and asylum seekers referred to PRIME were up to date with their vaccinations at the time of their referral.

Of the refugees and asylum seekers referred to PRIME after residing in Victoria for 12 months or more, just 28 per cent were up to date with their vaccinations.

Over the three years of PRIME, to November 2019, 91.2 per cent of refugees and asylum seekers who had been in the program 12 months or longer were up to date with their vaccinations. This result highlights the success of PRIME in supporting refugee and asylum seekers to complete their catch-up immunisation schedule (DHHS, 2020).

## References

Australian Government Department of Health, 2018. National Immunisation Strategy for Australia 2019 to 2024 <<https://www.health.gov.au/resources/publications/national-immunisation-strategy-for-australia-2019-to-2024>>.

Australian Government Department of Health, 2018. Historical coverage data tables for all children <<https://www.health.gov.au/health-topics/immunisation/childhood-immunisation-coverage/historical-coverage-data-tables-for-all-children>> .

Department of Health and Human Services 2016, '2016–17 State Budget: Refugee and asylum seeker health and wellbeing in Victoria', State Government of Victoria, Melbourne.

Department of Health and Human Services 2020, PRIME: Program for refugee immunisation monitoring and education. Briefingpaper: 2016–2019 outcomes.

Murdoch Children's Research Centre (n.d), SAEFVIC. Available at: <<https://www.mcri.edu.au/research/research-areas/infection-and-immunity/saefvic>>.

National Partnership on Essential Vaccines, 2017. Available at: <[https://federalfinancialrelations.gov.au/sites/federalfinancialrelations.gov.au/files/2021-01/essential\\_vaccines\\_np.pdf](https://federalfinancialrelations.gov.au/sites/federalfinancialrelations.gov.au/files/2021-01/essential_vaccines_np.pdf)>.

Victorian Department of Health, 2019. Immunisation schedule Victoria and vaccine eligibility criteria <<https://www.health.vic.gov.au/immunisation/immunisation-schedule-victoria-and-vaccine-eligibility-criteria>>.



# Chapter 14 – Non-communicable disease

Non-communicable disease typically refers to chronic disease.

Chronic disease is a broad classification that refers to illnesses that persist over a long period of time or constantly recur. Chronic diseases can have significant impacts on a person's wellbeing and individual circumstances, including their quality of life, and social and economic standing.

Chronic disease is the biggest challenge facing Victoria's healthcare system.

This section includes summarised data from the following major chronic disease groups.

- multi-morbidity
- cancer (including skin cancers)
- heart disease
- stroke
- diabetes
- asthma
- musculoskeletal conditions.

## Multi-morbidity

Multi-morbidity refers to an individual experiencing and living with two or more co-existing chronic conditions. Ageing populations and the increase in long-term conditions mean that the number of people with multiple health conditions is set to rise (VAHI, 2022).

Managing multiple long term health conditions can have a significant impact on a person's wellbeing, and often require complex ongoing care.

In 2019, the proportion of Victorian adults who reported being diagnosed with two or more of seven common chronic diseases (excluding asthma) was 19.6 per cent overall. This proportion was significantly lower in men (16.7 per cent) compared with women (22.1 per cent) (VAHI, 2022).



Almost **1 in 5** Victorian adults had two or more common **chronic diseases**

## Cancer

Cancer is a leading contributor to the burden of disease in Victoria.

In 2019, cancers were diagnosed in 19,931 men and 15,981 women. This equates to 98 new diagnoses every day or one every 15 minutes (Cancer Council Victoria, 2020).



In Victoria, there are **98 new cancer diagnoses** every day (that's one every 15 minutes).

At least one-in-three Victorians will develop a cancer by the age of 75, equating to more than one-in-three men and almost one-in-three women (Cancer Council Victoria, 2020).

Age-standardised rates of incidence for all cancers in Victoria from 1982–2019 increased by an average of 0.6 per cent per year for both men and women (Cancer Council Victoria, 2020).

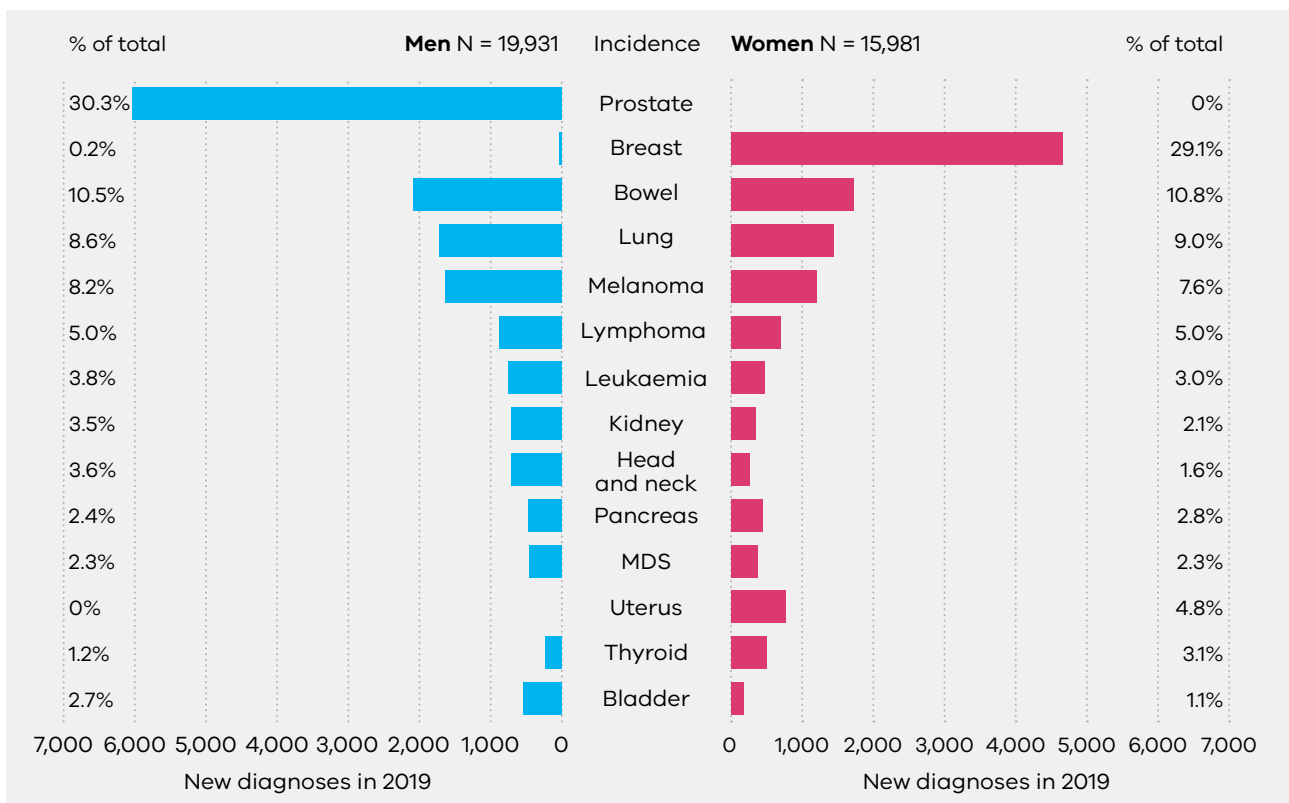
Cancer was strongly related to age, with less than one per cent of tumours occurring before age 20 and 61 per cent occurring in persons older than 65 years (Cancer Council Victoria, 2020).

The five most common cancers in Victoria are prostate, breast, bowel, lung, and melanoma. These most common cancers account for 57 per cent of all new cancers and 46 per cent of all cancer deaths (Cancer Council Victoria, 2020).

**Prostate, breast, bowel, lung and melanoma cancers** are the **most common** in Victoria



**Figure 1. Leading cancer types by sex, Victoria 2019 – number and percent of new cases (incidence) for the most common cancers**



There was an average of 236 diagnoses of cancer in Aboriginal Victorians each year between 2014–2018. Overall incidence rates were significantly higher for Aboriginal Victorians (561 and 497 new cases per 100,000 for Aboriginal men and women respectively) than for non-Aboriginal Victorians (348 and 288 new cases per 100,000 for non-Aboriginal respectively) (Cancer Council Victoria, 2020).

While an average of 31 Victorians die from cancer every day, death rates continue to decline.

Since 1982, annual decreases in death rates of 1.6 per cent for males and 1.3 per cent for females have been recorded (Cancer Council Victoria, 2020).



Annual Victorian **cancer death rates continue to decline**. Decrease of **1.6%** for males and **1.3%** for females since 1982

These reductions reflect earlier detection of cancers through screening, an improved understanding of risk factors (including genetics), reductions in tobacco use (especially in males), and improvements in treatment.

There were 429 cancer deaths of Aboriginal Victorians between 2014–2018, an average of 86 deaths a year. Cancer mortality rates in Aboriginal Victorians (222 and 187 deaths per 100,000 for men and women respectively) were more than twice those of other non-Aboriginal Victorians (99.2 and 71.8 deaths per 100,000 respectively) (Cancer Council Victoria, 2020).

Overall, the five-year cancer survival rate was 69 per cent, an increase from 67 per cent from 2009–2013 and 46 per cent in 1982–1986 (Cancer Council Victoria, 2020).

## Melanoma

Melanoma is a type of skin cancer that usually occurs on parts of the body that have been overexposed to the sun (Cancer Council Victoria, 2021).

In rare cases, melanomas can start inside the eye or in a part of the skin or body that has never been exposed to the sun such as the nervous system, mucous membrane (such as the lining of the mouth or digestive tract), soles of the feet, palms, and under the nails (Cancer Council Victoria, 2021).

Although it is one of the less common types of skin cancer, melanoma is considered the most serious because it is more likely to spread to other parts of the body, especially if not detected early. The earlier melanoma is found, the more successful treatment is likely to be (Cancer Council Victoria, 2021).

### Incidence and mortality

Australia has one of the highest rates of melanoma in the world.

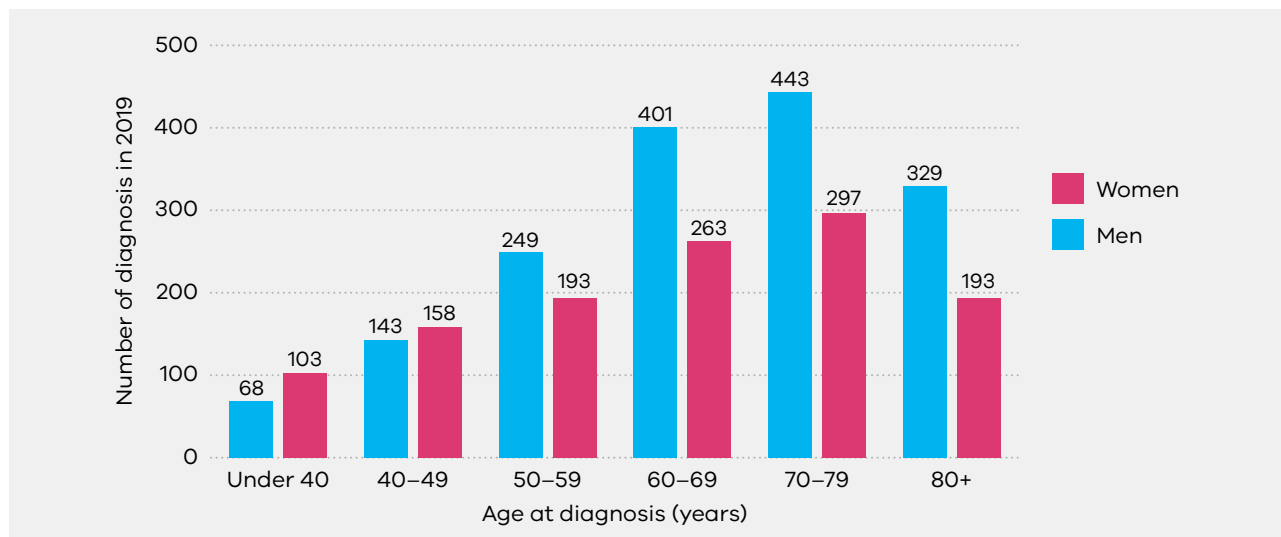
In 2019, 2,840 Victorians were diagnosed with melanoma. Of these cases, 1,633 (57.5 per cent) were males and 1,207 (42.5 per cent) females (Cancer Council Victoria, 2021).

The median age at diagnosis of melanoma is 63 years in males and 59 in females (Figure 2 and 3) (Cancer Council Victoria, 2021).

In 2019, there were 189 male and 81 female deaths caused by melanoma (Cancer Council Victoria, 2020).

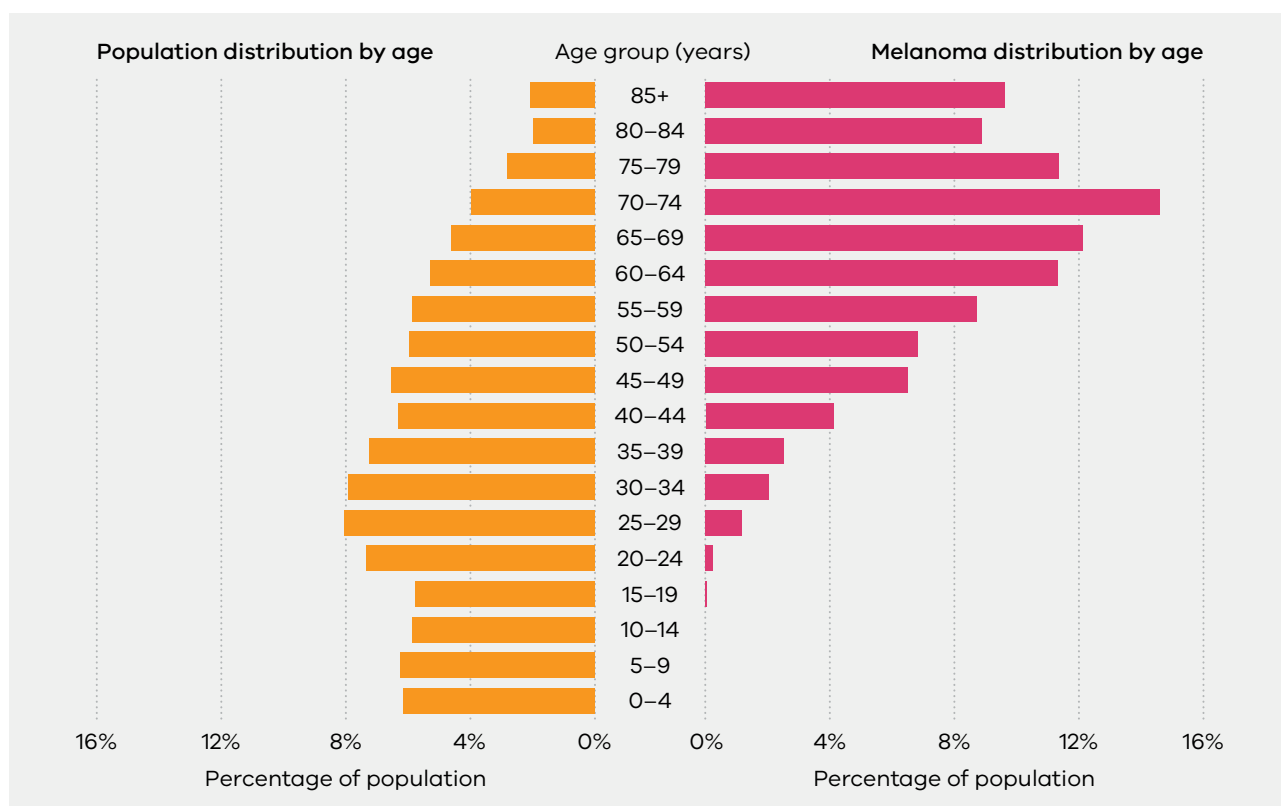
In 2019, melanoma accounted for 7.9 per cent of all cancers diagnosed and 2.4 per cent of all cancer-related deaths. Melanoma was the fifth most diagnosed cancer and the fourteenth most common cause of cancer-related death in Victoria (Cancer Council Victoria, 2021).

**Figure 2. Distribution of melanoma incidence in 2019, by sex within age groups**



Source: Victorian Cancer Registry (2021)

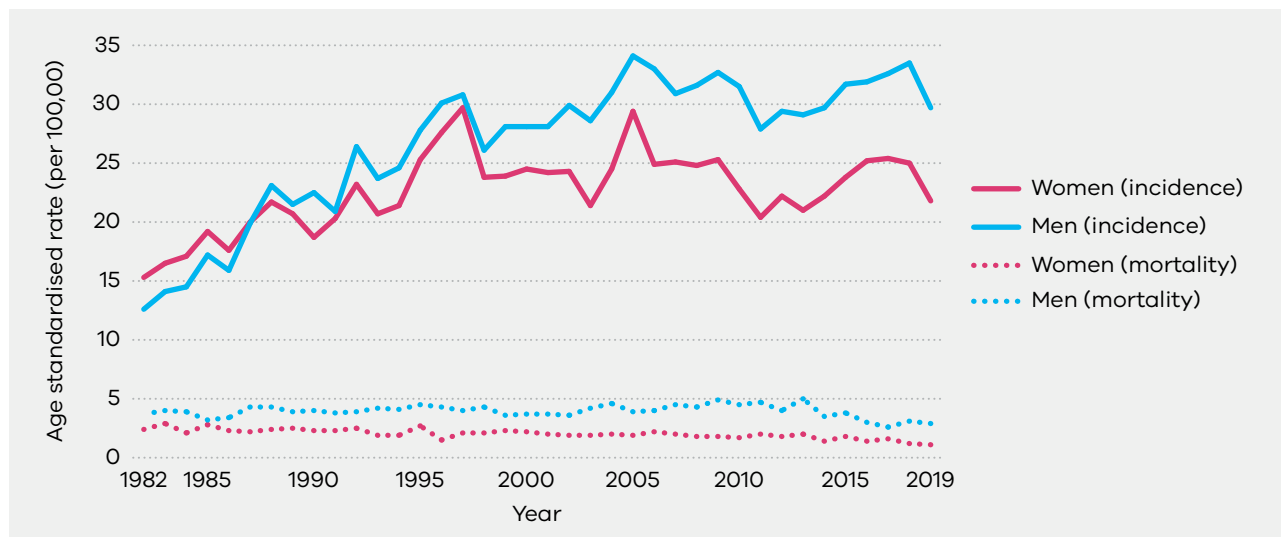
**Figure 3. Distribution of melanoma incidence in 2019 compared to the distribution of the Victorian population in 2019, by five-year age brackets**



Source: Victorian Cancer Registry (2021)



**Figure 4. Trend in incidence and mortality of melanoma for the period 1982–2019, by sex**



Average annual change (Men): Incidence 1.7%, Mortality -0.2%

Average annual change (Women): Incidence 0.7%, Mortality -1.5%

Source: Victorian Cancer Registry (2021)

Figure 4 shows that, since 1982, the incidence of melanoma has increased by an average of 1.7 per cent per year in males and 0.7 per cent in females. Over the past 37 years, mortality from melanoma has decreased by 0.2 per cent per year in males and 1.5 per cent per year in females (Cancer Council Victoria, 2021).

### Survival rates

Five-year survival rates for melanoma increased from 88 per cent between 1989–1993 to 92 per cent between 2014–2018 (Cancer Council Victoria, 2021).

Increasing sun protection and early detection are key to further reducing the disease burden of melanoma.

## Non-melanoma skin cancer

Non-melanoma skin cancer is the most commonly treated cancer in Australia. It includes basal cell carcinoma and squamous cell carcinoma.

Rare types of non-melanoma skin cancer include Merkel cell carcinoma and angiosarcoma.

### Prevalence of non-melanoma skin cancer

There are estimated to be more than 40,000 new diagnoses of the common types of non-melanoma skin cancers (basal and squamous cell carcinomas) each year in Victoria (Cancer Council Victoria, 2020).

These skin cancers are not reported to the Victorian Cancer Registry. Therefore only an estimate of their incidence can be provided.

Non-melanoma skin cancers are often self-detected and are usually removed in doctors' surgeries, sometimes without histological confirmation due to destructive treatment techniques, or treatment with topical creams where tumour sites are only excised in post-treatment testing (Staples, 2006).

To overcome this lack of data, datasets such as Medicare item codes for skin cancer treatments (that is, excisions, curettage, laser or liquid nitrogen cryotherapy treatments) are used as a proxy measure.

In 2021, non-melanoma skin cancers accounted for 1,148,214 paid Medicare services, Australia-wide. The figure is extracted from data on non-melanoma skin cancers excisions, curettage, laser, or liquid nitrogen cryotherapy treatments (Services Australia, 2022).

Findings from the annual Bettering of Evaluation and Care of Health (BEACH) surveys of general practice, conducted between 2006–2016, showed that skin cancer predominated as the cancer most often managed (by way of medications, clinical and procedural treatments, ordering of pathology or imaging tests) in GP-patient encounters, and was consistently among the top 10 conditions managed by GPs (Britt, 2016).

Despite the high incidence rate of non-melanoma skin cancer mortality rates are relatively low. In 2019, the ABS reported 122 deaths in Victoria from non-melanoma skin cancers (ABS, 2019).

### **Cost of treatment**

Non-melanoma skin cancer places a substantial cost burden on the health system. It accounts for 8.1 per cent of all health system spending on cancer in Australia – excluding cancer screening (AIHW, 2016).

In 2015–16 non-melanoma skin cancer incurred the second highest estimated expenditure by cancer site in Australia, costing an estimated \$1.005 billion (AIHW, 2021).

Non-melanoma skin cancers accounted for one quarter of all cancer-related hospitalisations in Australia in 2019–20 (AIHW, 2021).

The risk of non-melanoma skin cancer increases with age. The ageing of the Victorian population is likely to contribute to an increase in the number of cancers treated and an increase in the economic burden of non-melanoma skin cancer. This burden falls not only on primary care, but also on hospitals through admissions and outpatient services.

In 2012–13, there were 12,700 Victorian public hospitals admissions for treating melanoma and non-melanoma skin cancer. The cost for treating non-melanoma skin cancer was \$29 million (Shih et al, 2017). In addition, there were 14,000 outpatient treatments for managing skin cancer in Victoria (Shih et al, 2017).

In total, treating skin cancer in Victorian public hospitals is estimated to annually cost about \$50 million (between \$49.3 million and \$55.7 million). That cost rises to between \$121 million and \$127 million when private hospital admissions are included (Shih et al, 2017).

### **Cost-effectiveness of prevention**

Nearly all non-melanoma skin cancer in Australia can be attributed to high exposure to ultraviolet radiation, making it largely preventable with sun protective behaviours.

On a per patient measure, Victoria spends 30 times more on the treatment of skin cancer than the prevention of skin cancer (Shih et al, 2017).

Economic evaluations show prevention programs are highly cost effective, with the Victorian SunSmart program returning \$2.22 for every dollar invested (Shih et al, 2017).

From 1988–2011, it is estimated that SunSmart Victoria prevented more than 43,000 cases of skin cancer, including 32,200 non-melanoma skin cancer, and 1,400 skin cancer deaths (Shih et al, 2017).

SunSmart Victoria's success demonstrates the economic and health effectiveness of prevention measures (Shih et al, 2017).

## Heart disease

Heart disease is one of the leading causes of death in Australia and Victoria.

Heart disease is a collective term for many different diseases of the heart. The term commonly includes diseases such as coronary or ischaemic heart disease, heart failure, cardiomyopathy and congenital heart disease (VAHI, 2021).

Coronary heart disease is the most common form of heart disease in Australia. The two major forms of coronary heart disease are heart attack (also known as acute myocardial infarction) and angina.

A heart attack is caused when blood supply to the heart is completely blocked, often causing damage to the heart muscle and its function.

Angina is a chronic condition where short episodes of chest pain occur periodically, caused by a temporary shortage of blood supply to the heart. Angina is not usually life-threatening, but can be associated with increased risk of heart attack.

Coronary or ischaemic heart disease remains the leading cause of death in Victoria for males and females. It accounts for 11.67 per cent of all deaths (ABS, 2019).

Several heart disease risk factors are modifiable and include:

- smoking
- high cholesterol
- high blood pressure
- diabetes
- inactivity
- overweight and obesity
- unhealthy diet
- depression and social isolation (Heart Foundation, 2022).

Prevalence of heart disease is higher among the lowest socioeconomic groups and Aboriginal and Torres Strait Islander people (Heart Foundation, 2022).

Overall, people in lower socioeconomic groups, Aboriginal and Torres Strait Islander peoples, and those living in remote areas have higher rates of hospitalisation and death resulting from heart disease than other Australians (Heart Foundation, 2022).

The prevalence of self-reported doctor-diagnosed heart disease in Victorians was 7.3 per cent, with significantly higher prevalence observed in males (9 per cent) than females (5.8 per cent) (DHHS, 2019).



Victorians' **self-reported doctor-diagnosed** heart disease was **7.3%**

## Stroke

Stroke occurs when a blood vessel supplying blood to the brain either blocks (ischaemic stroke) or ruptures and bleeds (haemorrhagic stroke) (Stroke Foundation, 2022). Ischaemic stroke accounts for about 80 per cent of stroke, while haemorrhagic stroke accounts for about 20 per cent (VAHI, 2021).

Both kinds of stroke can result in part of the brain dying, leading to sudden impairment that can affect a number of bodily functions.

Stroke often causes paralysis of parts of the body normally controlled by the area of the brain affected by the stroke. It can also cause speech problems and other symptoms, such as difficulties with swallowing, vision, and thinking (AIHW, 2021).

In 2019, stroke was the third leading cause of death in Victoria. It was responsible for more than 5.4 per cent of all deaths in the state, with females more likely to die from stroke than males (ABS, 2019).

In Victoria, 2.3 per cent of people have self-reported prevalence of stroke and was not significantly different between the sexes (DHHS, 2019).

This data also identified that the prevalence of stroke decreased significantly with increasing total annual household income for females. No significant trend was observed for males.

## Diabetes

Diabetes mellitus (also called diabetes) is a common chronic condition characterised by high blood glucose (sugar) levels (DHHS, 2019).

The two main types of diabetes are type 1 (insulin-dependent) diabetes and type 2 diabetes (DHHS, 2019).

Gestational diabetes is another form of diabetes that affects women during pregnancy, although they have had no prior diagnosis of diabetes (Diabetes Australia, 2022).

In Victoria, 6.2 per cent of people have self-reported doctor-diagnosed diabetes. The overall proportion of adults that reported being diagnosed with type 1 diabetes was 0.5 per cent, while the figure for type 2 diabetes was 5.7 per cent. This figure remained stable for 2015–2019 (DHHS, 2019).



**6.2%** of Victorian adults reported to have **diabetes**.

Type 1 diabetes **0.5%** overall

Type 2 diabetes **5.7%** overall

The prevalence of diabetes increases with age, and is highest in people aged 55 or older. Compared with the proportion in all Victorian adults, the proportion of adults who reported being diagnosed with type 2 diabetes was significantly higher in people who: were unemployed; had a total annual household income of less than \$40,000; or rented their homes (VAHI, 2021).

### Type 1 diabetes

Type 1 diabetes is an autoimmune disease in which the body's immune system destroys the insulin-producing cells of the pancreas.

This means the affected individual is unable to produce enough insulin, which is an essential hormone for controlling glucose levels in the blood.

Type 1 diabetes most commonly begins in people under the age of 30 years. People with type 1 diabetes require replacement insulin injections several times a day for life.

Unlike type 2 diabetes, described in the following section, it is not caused by lifestyle factors (Diabetes Australia, 2022).

Type 1 diabetes accounts for approximately 10 per cent of cases of diabetes in Victoria (Diabetes Australia, 2022).

### Type 2 diabetes

Type 2 diabetes is the most common form of diabetes. It occurs mostly in people aged 40 or older.

Risk factors for type 2 diabetes include being overweight or obese and having a family history of the condition (Diabetes Australia, 2022).

Type 2 diabetes accounts for around 85 per cent of all cases of diabetes (Diabetes Australia, 2022). It is caused by insufficient production of insulin and/or the body becoming resistant to insulin levels in the blood.

Although type 2 diabetes mostly occurs in people aged over 40, the disease is becoming increasingly prevalent in younger age groups (VAHI, 2021).

In some cases of type 2 diabetes, appropriate diet and exercise can control the condition. More severe cases require treatment with medications, insulin injections, or a combination of medication and insulin injections (DHHS, 2018).

## Gestational diabetes

Gestational diabetes occurs during pregnancy.

It is usually detected around weeks 24–28 of pregnancy, although it can develop earlier. The condition usually disappears once the baby is born. However, a history of gestational diabetes increases a woman's risk of developing type 2 diabetes later in life (VAHI, 2021).

In 2019, gestational diabetes was reported in 2.2 per cent of adult women in Victoria (DHHS, 2019).

## Asthma

Asthma is a common chronic inflammatory condition of the airways.

People with asthma experience episodes of wheezing, breathlessness, and chest tightness due to widespread narrowing of the airways (Department of Health and Aged Care, 2018).

In 2019, the overall proportion of Victorian adults who reported ever being diagnosed with asthma was 21.7 per cent. The proportion was significantly lower in men (19.4 per cent) than women (23.7 per cent).



**21.7%** of Victorian adults had reported being diagnosed with **asthma**.

The overall proportion of adults who reported being diagnosed with asthma in the previous year was 11.7 per cent. The proportion was significantly lower in men (10.2 per cent) than women (15.4 per cent). (VAHI, 2022).

Asthma cannot be cured. However, with good management, people with asthma can lead normal, active lives. A range of programs and services are available to support people with asthma (Better Health Channel, 2021).

## Musculoskeletal conditions

The most recent national data in 2017–2018 estimates that seven million or almost one-in-three (29 per cent) Australians have a musculoskeletal condition (AIHW, 2020).

The World Health Organisation states that 'musculoskeletal conditions are the leading contributor to disability worldwide' (WHO, 2022). In Victoria, osteoporosis and arthritis are two of the most prevalent chronic musculoskeletal conditions.

### Osteoporosis

Osteoporosis is a mostly preventable condition. It is caused when bones lose mineral (such as calcium) more quickly than they can be replaced (Better Health, 2019). This loss of minerals leads to a progressive loss of bone density and strength. As a result, bones fracture more easily. This increases the risk of injury from an incident as simple as falling out of a bed or chair, or tripping while walking (VAHI, 2022).

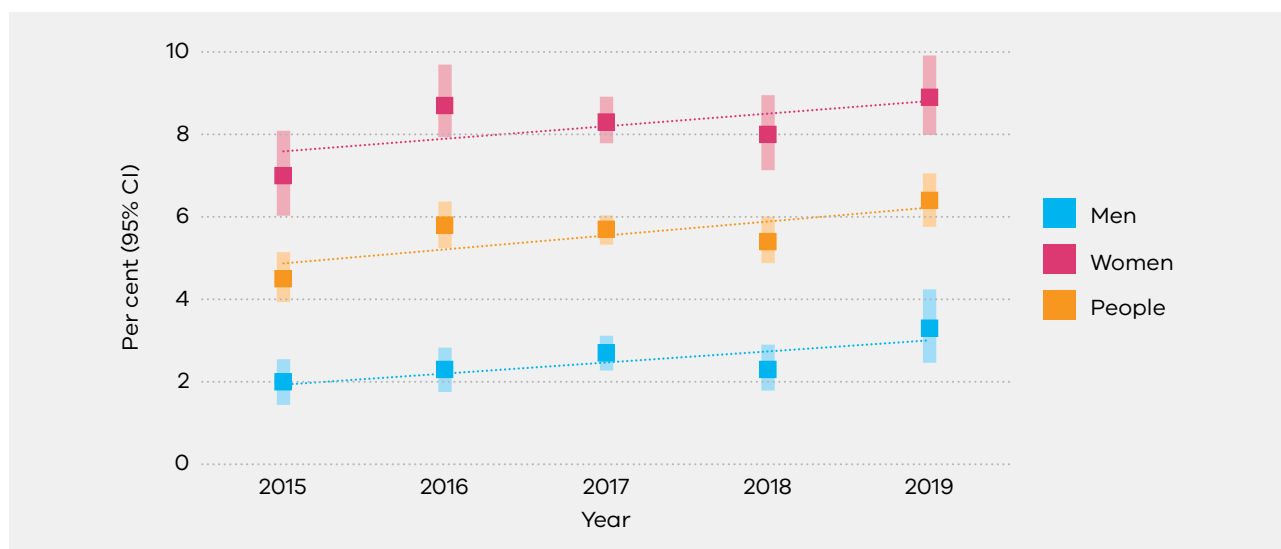
Often people are not aware they have osteoporosis because it lacks obvious symptoms.

In 2019, the overall proportion of Victorian adults who self-reported after a diagnosis of osteoporosis was 6.4 per cent. The proportion was significantly lower in men (3.3 per cent) than women (8.9 per cent). Estimates for 2015–2019 were stable, but increased slightly.

From a young age, both men and women can implement the following preventative steps to combat osteoporosis. Preventative measures include: eating a variety of healthy foods (such as fresh fruit, vegetables, and whole grains); having a calcium-rich diet; absorbing enough vitamin D; and performing regular weight-bearing and strength-training activities. Avoiding smoking and limiting caffeine and alcohol consumption will also reduce risks of osteoporosis later in life (Department of Health, 2021).

There is no standard treatment for osteoporosis. It often depends on individual needs, but can include osteoporosis medications, as

**Figure 5. Proportion of people (18+ years) who were ever diagnosed with osteoporosis, by gender, Victoria, 2016–2019**



Data were age-standardised to the 2011 Victorian population.  
LL/UL 95% CI = lower/upper limit of 95 per cent confidence interval.

well and performing a range falls prevention exercise to reduce risk of fractures (Department of Health, 2021).

Find out more about falls prevention in ‘Chapter 16 – Injury prevention’.

## Arthritis

Arthritis is a general term that refers to more than 150 different conditions that affect the muscles, bones, and joints.

People who have arthritis often experience joints that are inflamed, causing discomfort and pain.

Two of the most common forms of arthritis are osteoarthritis (a degenerative condition affecting the weight-bearing joints such as hips, knees, ankles, hands, and the spine) and rheumatoid arthritis (an autoimmune disease where the body’s immune system attacks its own tissues).



**20.9%** of Victorian’s report being diagnosed with **arthritis**

In 2019, the overall proportion of adults who reported a diagnosis with arthritis was 20.9 per cent. The proportion was significantly lower in men (17.3 per cent) than women (24 per cent) (VAHI, 2022).

## References

Australian Bureau of Statistics 2019, Underlying cause of death, All causes, Victoria, 2019, ABS, Canberra.

Australian Institute of Health and Welfare (2021) *Heart, stroke and vascular disease – Australian facts*, AIHW, Australian Government.

Australian Bureau of Statistics. Causes of Death, Australia. Canberra, ACT; 2019 Report No.: Catalogue No 3303.0.

Australian Institute of Health and Welfare 2016, ‘Skin cancer in Australia, Australian Institute of Health and Welfare’, Canberra.

Australian Institute of Health and Welfare (AIHW) 2020, Arthritis, Australian Government, Canberra retrieved from <[www.aihw.gov.au/reports/chronic-musculoskeletal-conditions/arthritis-snapshot/contents/arthritis](http://www.aihw.gov.au/reports/chronic-musculoskeletal-conditions/arthritis-snapshot/contents/arthritis)>.

Australian Institute of Health and Welfare 2021, Health system expenditure on cancer and other neoplasms in Australia 2015–2016. Australian Government, <<https://www.aihw.gov.au/getmedia/6bff10f3-3ec8-43d7-a967-55c5168da174/aihw-can-142.pdf.aspx?inline=true>>.

Australian Institute of Health and Welfare. Cancer in Australia 2021. Australian Government 2021, <<https://www.aihw.gov.au/getmedia/0ea708eb-dd6e-4499-9080-1cc7b5990e64/aihw-can-144.pdf.aspx?inline=true>>.

Australian Institute of Health and Welfare (AIHW) 2022, 'Diabetes: Australian facts', (viewed 16 September 2022), <<https://www.aihw.gov.au/reports/diabetes/diabetes>>.

Britt H, Miller GC, Bayram C, Henderson J, Valenti L, Harrison C, Pan Y, Charles J, Pollack AJ, Chambers T, Gordon J, Wong C 2016, A decade of Australian general practice activity 2006–07 to 2015–16. General practice series no. 41. Sydney, Australia: Sydney University Press; 2016 Available from: <[https://ses.library.usyd.edu.au/bitstream/2123/15482/5/9781743325162\\_ONLINE.pdf](https://ses.library.usyd.edu.au/bitstream/2123/15482/5/9781743325162_ONLINE.pdf)>.

Cancer Council Victoria 2020, Cancer in Victoria: Statistics and Trends 2019 (PDF) Cancer Council Victoria, Melbourne, <<https://www.cancervic.org.au/downloads/cec/cancer-in-vic/Cancer-in-Victoria-2019.pdf>>.

Cancer Council Victoria 2021, Melanoma Fact Sheet Cancer Council Victoria, Melbourne, <<https://www.cancervic.org.au/research/vcr/fact-sheets-and-annual-reports/melanoma-factsheet.html>>.

Department of Health and Human Services 2019, 'Victorian Population Health Survey 2019: Selected survey findings', State of Victoria, Melbourne.

Department of Health and Human Services 2019 'Victorian population health survey 2019' State Government of Victoria, Melbourne.

Department of Health 2021, 'Better Health Channel, Asthma explained'. State of Victoria, Melbourne. Available from: <[www.betterhealth.vic.gov.au/health/healthyliving/exercise-and-mental-health](http://www.betterhealth.vic.gov.au/health/healthyliving/exercise-and-mental-health)>.

Department of Health 2021, 'Better Health Channel, Osteoporosis'. State of Victoria, Melbourne. Available from: <[www.betterhealth.vic.gov.au/health/conditionsandtreatments/osteoporosis](http://www.betterhealth.vic.gov.au/health/conditionsandtreatments/osteoporosis)>.

Diabetes Australia 2022, 'About Diabetes', (viewed 16 September 2022), <<https://www.diabetesaustralia.com.au/about-diabetes/what-is-diabetes/>>.

Heart Foundation 2022, 'Are you at risk of heart disease?' (viewed 15 September 2022), <<https://www.heartfoundation.org.au/bundles/your-heart/are-you-at-risk-of-heart-disease>>.

Services Australia 2022. Medicare Item Reports. [homepage on the internet] Canberra Australia; Available from: <[http://medicarestatistics.humanservices.gov.au/statistics/mbs\\_item.jsp](http://medicarestatistics.humanservices.gov.au/statistics/mbs_item.jsp)>.

Shih S, Carter R, Heward S and Sinclair C 2017, 'Skin cancer has a large impact on our public hospitals but prevention programs continue to demonstrate strong economic credentials', Australian New Zealand Journal of Public Health, vol. 41, no. 4, pp. 371–76.

Staples MP, Elwood M, Burton RC, Williams JL, Marks R, Giles GG 2006. 'Non-melanoma skin cancer in Australia: the 2002 national survey and trends since 1985.' *Med J Aust* 2006 Jan 2;184(1):6–10. Available from: <<http://www.ncbi.nlm.nih.gov/pubmed/16398622>>.

Stroke Foundation 2022, 'What is a stroke', (viewed 16 September 2022), <<https://strokefoundation.org.au/about-stroke/learn/what-is-a-stroke>>.

Victorian Agency for Health Information 2021, Victorian Population Health Survey 2019: summary of results, State of Victoria, Melbourne.

World Health Organisation 2022, Musculoskeletal health, <[www.who.int/news-room/fact-sheets/detail/musculoskeletal-conditions](http://www.who.int/news-room/fact-sheets/detail/musculoskeletal-conditions)>.





# Chapter 15 – Mental health

Mental health is a key component of overall health and wellbeing (WHO, 2021) and affects not only the individual but also their friends, families, and carers.

Mental health impacts and is impacted by a wide range of lifestyle and socioeconomic factors, including access to services, living conditions, and employment status.

Several socioeconomic and environmental determinants of mental health are also negatively affected by climate change (WHO, 2022).

This section includes:

- Mental illness and mental wellbeing
- *Royal Commission into Victoria's Mental Health System Interim Report 2019*
- Suicide prevention.

## Mental illness and mental wellbeing

Mental health is an important factor for individual and community wellbeing, and significantly contributes to the social, cultural and economic life of Victoria.

Many Victorians report positively on some indicators which can contribute to mental wellbeing.

For example, in 2019, 75.2 per cent of Victorians reported that they had very high or high satisfaction with life (VAHI, 2021). However, one-in-five Victorians will experience a mental health condition each year and 45 per cent of Victorians experiencing one during their lifetime (ABS, 2018).

In 2019, 29.8 per cent of Victorian adults reported that they had, during their life, been diagnosed by a doctor with depression or anxiety, while 14.9 per cent had been diagnosed in the previous 12 months (VAHI, 2021). A large body of research indicates that social isolation and loneliness have detrimental physical and mental health consequences (Holt-Lunstad, Smith, Baker, Harris and Stephenson, 2015).

In 2019, 18.1 per cent of adults reported high or very high levels of psychological distress, an important risk factor for a number of physical and mental health conditions (VAHI, 2021).



**18.1%** of adults reported high or very high levels of **psychological distress**

Those who do not feel connected or valued by society are more likely to report psychological distress, low income, and poor or fair self-reported health.

In addition, culturally diverse, disadvantaged, and vulnerable community groups have a higher risk of poor mental health and mental illness due to greater exposure to adverse social, economic and environmental circumstances.

## Burden of disease

Thirteen per cent of Australia's disease burden is due to mental and substance-use disorders, with most of the burden being a non-fatal (disability) burden. Mental and substance-use disorders were the second largest disease group contributing to non-fatal burden in Australia between 2003–2018 (AIHW, 2021).

## Depression and anxiety

Overall, 29.8 per cent of Victorian adults in 2019 reported that they had been diagnosed with depression or anxiety by a doctor during their lifetime. This figure was significantly higher in females (36 per cent) than males (23.7 per cent) (VAHI, 2021).



**29.8%** of Victorian adults reported **ever** being **diagnosed with depression or anxiety** by a doctor

The overall proportion of adults who were diagnosed with anxiety or depression by a doctor during 2019 was 15 per cent. This figure was significantly lower in men (11.4 per cent) than women (18.8 per cent) (VAHI, 2021).

**15%** of Victorian adults **diagnosed with anxiety or depression** in 2019

Lower in men (**11.4%**) compared with women (**18.8%**)



The proportion of adults reporting a diagnosis of depression or anxiety was similar between the ages 18 to 75. However, adults aged 75 years or older were less likely to report having been diagnosed with depression or anxiety during their lifetime, compared with other age groups (VAHI, 2021).

The lifetime prevalence of self-reported doctor-diagnosed depression or anxiety increased significantly for both males and females between 2015–2019 (VAHI, 2021).

## Psychological distress

In 2019, 18.1 per cent of Victorian adults experienced high or very high levels of psychological distress. Rates of psychological distress were significantly higher in females (21 per cent) than males (15.6 per cent) (VAHI, 2021).

Very high levels of psychological distress were significantly higher in men and women who: were Aboriginal; had not completed high school; were unemployed; were widowed, divorced, or never married; or had a total annual household income of less than \$40,000 (VAHI, 2021).

Thirty-one per cent of Aboriginal respondents in the 2018–2019 National Aboriginal and Torres Strait Islander health survey reported high or very high psychological distress, nearly three times that of the non-Aboriginal rate at 13 per cent over the same period (ABS, 2019).

One-in-five (20 per cent) of Victorian students in years 5, 8 and 11 experienced psychological distress (Department of Education and Training, 2019).

## Social isolation and loneliness

In 2018, the Australian Loneliness Report estimated that one-in-four Australian adults aged between 18 to 89 years experienced loneliness (Australian Psychological Society and Swinburne University, 2018). Social isolation and loneliness have been found to predict not only mental health conditions (such as depression), but a range of other health conditions (such as cardiovascular disease and cognitive decline) (Smith and Lim, 2020).



**1 in 4** Australian adults experience loneliness\*

\* Adults between 18–89 years of age

Social isolation and loneliness can occur across the community, but can be more prevalent in certain groups, including:

- older people
- those from lower socioeconomic groups
- Aboriginal people
- people who speak a language other than English
- people living with a disability
- people in housing stress or experiencing homelessness
- those who are single, childless or living alone
- those with low levels of literacy where this reduces access to information and services (Commissioner for Senior Victorians, 2016).

A study of older Victorians found 10 per cent aged 60 or older experienced loneliness. In addition, reported rates of loneliness increased as people aged (Commissioner for Senior Victorians, 2016). This study also identified 'life events, traumas and transitions' as risk factors for loneliness in older Victorians.

Examples of events that could trigger loneliness or worsen existing social isolation include:

- retirement
- relocation to a new area
- adjustment to loss of a partner
- the onset of health conditions
- changes in lifestyle associated with becoming a carer.

### Sought professional help for a mental health problem

In 2019, the overall proportion of adults who sought professional help for a mental-health related problem in the past 12 months was 18.8 per cent (VAHI 2021). This proportion was significantly lower in men (14 per cent) than women (23.8 per cent).



**18.8%** Victorian adults sought **professional help** regarding their mental health

In 2019, the proportion of adults who sought professional help for a mental-health related problem was significantly higher in people who: were born in Australia; were widowed, divorced/separated, or never married; were unemployed; or had a total annual household income of less than \$40,000 (VAHI, 2021).

### Support for Victorians with mental illness

In 2018–2019, \$1.54 billion was invested in mental health clinical services in Victoria. An additional \$118.5 million was provided for community mental health support services (DHHS, 2020).

Services included hospital-based care and community programs for at-risk groups (including LGBTIQ+ and Aboriginal and Torres Strait Islander communities) as well as supports for asylum seekers (DHHS, 2019). Investments were also made for initiatives to strengthen and enhance the mental health workforce, including more support for psychiatrists and a transition to practice program for nurses.

For information about mental health services in Victoria, visit the [Better Health Channel](https://www.betterhealth.vic.gov.au/servicesandsupport/mental-health-services) <<https://www.betterhealth.vic.gov.au/servicesandsupport/mental-health-services>>. The [Mental Health Foundation](https://www.mhfa.org.au/) <<https://www.mhfa.org.au/>> also provides information and online support groups as well as practical tips to support mental health.

### Royal Commission into Victoria's Mental Health System Interim Report 2019

The Royal Commission into Victoria's Mental Health System delivered its interim report in November 2019.

The interim report contained nine priority recommendations to address immediate needs and lay the foundations for a new approach to mental health. The report created a key opportunity to commence work on issues fundamental to improving Victoria's mental health and wellbeing system before the final report was released in March 2021.

A key recommendation was the establishment of a reform office to commence work on implementation and build the relationships and foundations necessary for an ongoing reform program.

Other recommendations included: expanding acute beds across the system (such as hospital-in-the-home and using private beds for public patients), establishing new Aboriginal social and wellbeing teams, expanding post-suicide outreach programs so that they cover the whole state, and focusing on new and expanded workforces (such as training and employing more people with lived experience of mental ill health).

Work on implementing the recommendations commenced in 2020.

## Suicide prevention

There was a slight decrease in the suicide rate in 2019, at 10.7 per 100,000 population, compared with 10.8 in 2018 (AIHW, 2020).

Released in July 2016, the *Victorian suicide prevention framework 2016–25* set Victoria's priorities for suicide prevention as part of Victoria's 10-year mental health plan. The framework outlined five key objectives, with the overall goal to halve Victoria's suicide rate by 2025 (DHHS, 2016).

The framework is supported by investment of \$27 million in 2016–17 over four years to enable action across the five objectives and support the implementation of the two flagship initiatives –place-based suicide prevention trials and the Hospital Outreach Post-suicidal Engagement initiative.

### Place-based suicide prevention trials

Since 2016, the Victorian Government and Primary Health Networks have partnered to support the development and implementation of coordinated, place-based approaches to suicide prevention in 12 trial sites across Victoria.

Each trial site actively engaged with the local community and established governance structures, reviewing groups at risk of suicide and developing action plans.

Local activities have included training to build the confidence and skills of people with lived experience in talking about suicide, supporting GPs to recognise and help people at risk of suicide, and working with the community to develop a protocol for response after a suicide.

### Hospital Outreach Post-Suicidal Engagement initiative

The Hospital Outreach Post-Suicidal Engagement (HOPE) initiative provides practical, tailored and accessible psychosocial support and assertive outreach for people following a suicide attempt, self-harm or suicidal crisis.

HOPE teams work with individuals and their personal support networks (families, carers, or other supporters) for up to three months, helping them identify and build protective factors against suicide.

The HOPE initiative began with six sites, with service delivery commencing in 2017. In 2018–19, the State Budget allocated an additional \$18.7 million to expand the HOPE initiative to another six sites in Victoria, demonstrating the commitment to innovative, person-centred and trauma-informed psychosocial responses to suicide prevention.

In its interim report, the Royal Commission into Victoria's Mental Health System recommended further expansion of the HOPE initiative to all area mental health services to provide universal access to the service (recommendation 3). The recommendation also included expanded referral pathways, subregional outreach, and extended service hours.

In the 12–18 months up to the end of 2019, the initiative supported more than 800 people and their families following a suicide attempt.

## References

Australian Bureau of Statistics 2018, 'National Health Survey: First results, 2017–18' (viewed 28 September 2022), <<https://www.abs.gov.au/statistics/health/health-conditions-and-risks/national-health-survey-first-results/latest-release#mental-and-behavioural-conditions>>.

Australian Bureau of Statistics 2019, 'National Aboriginal and Torres Strait Islander Health Survey, 2018–19' (viewed 28 September 2022), <<https://www.abs.gov.au/statistics/people/aboriginal-and-torres-strait-islander-peoples/national-aboriginal-and-torres-strait-islander-health-survey/latest-release>>.

Australian Institute of Health and Welfare 2021, 'Australian Burden of Disease Study: Impact and causes of illness and death in Australia 2018' (viewed 28 September 2022), <<https://www.aihw.gov.au/reports/burden-of-disease/abds-impact-and-causes-of-illness-and-death-in-aus/summary>>.

Australian Institute of Health and Welfare 2020, 'Suicide and self-harm monitoring' (viewed 6 October) from <<https://www.aihw.gov.au/suicide-self-harm-monitoring/data>>.

Department of Health and Aged Care 2018, 'What we're doing about lung and respiratory conditions' available at <[www.health.gov.au/health-topics/chronic-conditions](http://www.health.gov.au/health-topics/chronic-conditions)>.

Department of Health and Human Services 2020, 'Victoria's Mental Health Services Annual Report 2019–20' available at <[www2.health.vic.gov.au/mental-health/priorities-and-transformation/mental-health-annual-report](http://www2.health.vic.gov.au/mental-health/priorities-and-transformation/mental-health-annual-report)>.

Department of Health and Human Services 2020, 'Victoria's Mental Health Services Annual Report 2018–19' available at <<https://www.health.vic.gov.au/publications/victorias-mental-health-services-annual-report-2018-19>>.

Smith, B J and Lim, M H 2020, 'How the COVID-19 pandemic is focusing attention on loneliness and social isolation,' *Public Health Research & Practice*, vol. 30(2) published online 30 June 2020, <<https://doi.org/10.17061/phrp3022008>>.

Victorian Agency for Health Information 2021.

Victorian Population Health Survey 2019: summary of results, State of Victoria, Melbourne.

World Health Organization 2022, Mental health and climate change: Policy brief.



# Chapter 16 – Injury prevention

Injury affects Victorians of all ages. It is a major burden of disease that is preventable.

Effective injury prevention measures identify injury causes – and remove or reduce people’s exposure to those causes.

This section provides Injury prevention information for Victorians, including:

- family violence prevention
- impact of family violence
- falls prevention among older Victorians.

## Family violence prevention

The 2015–16 Royal Commission into Family Violence recognised that preventing family violence was essential for the health and wellbeing of the Victorian community and required long-term investment.

### Impact of family violence

Family violence is a major health and welfare issue that has far-reaching and serious impacts. Those impacts include physical and mental health, loss of housing, loss or limited access to employment, precarious financial security, isolation and the alienation of extended family, and social support (Australia’s National Research Organisation for Women’s Safety, 2016).

Although family violence can be experienced in a variety of ways and through a range of different relationships, it is overwhelmingly perpetrated by men against women and children. Family violence impacts victims for the rest of their lives. At its most heinous, it is the cause of senseless deaths (Victorian Government, *Ending Family Violence: Victoria’s Plan for Change*).

In 2018–19, there were 82,649 incidents of family violence recorded by Victoria Police (Crime Statistics Agency, Family Violence Data Portal). The cost of family violence in Victoria was estimated at \$5.3 billion in 2015–16 (KPMG, 2017).



**82,649** incidents of **family violence** recorded by Victoria Police in 2018–19

Since the Royal Commission into Family Violence, the Victorian government has invested more than \$3.7 billion – across prevention, early intervention, and responses to family violence – to keep victim survivors and children safe, hold perpetrators to account, and prevent violence.

The primary prevention of family violence means stopping violence by identifying and addressing its causes. Primary prevention requires a whole-of-community approach to drive social and cultural change to address the attitudes, behaviours, systems and structures that condone or enable violence.

## Drivers of violence against women

Research indicates that factors associated with gender inequality are the most consistent predictors of violence against women (Our Watch 2021).

The gendered drivers of violence against women are:

- condoning of violence against women
- men's control of decision-making and limits to women's independence in public and private life
- rigid gender stereotyping and harmful forms of masculinity
- male peer relations that emphasise aggression, dominance, and control.

## Primary prevention work

Since the Royal Commission into Family Violence, the Victorian Government has committed \$345 million for primary prevention and gender equality initiatives. This includes \$84.3 million to implement the Free from Violence primary prevention strategy.

Through the [Free from Violence primary prevention strategy's First action plan 2018–2021](https://www.vic.gov.au/free-violence-victorias-strategy-prevent-family-violence), the Victorian Government is investing in strategies to ensure that prevention messages and programs reach people in the places they live, work, learn, and socialise.

Key initiatives include:

- the establishment of Respect Victoria, an authority for primary prevention to lead Victoria's research, public engagement, and behaviour change agendas
- the 'Respect Women: Call it Out' behaviour change advertising campaigns, which provide the community with tools to call out disrespectful and sexist behaviour
- antenatal and postnatal parenting programs
- respectful relationships education in schools

- primary prevention in TAFEs and universities
- partnerships with local government and women's health services
- innovative community-led initiatives (such as with Aboriginal, and culturally and linguistically diverse communities, LGBTIQ+ communities) in different settings (such as the arts and sport)
- building the primary-prevention workforce.

These prevention initiatives are increasing Victorians' understanding of gender-based violence and strengthened ongoing efforts to create positive change and stop violence from occurring in the first place.

To support building the evidence base on what works to prevent violence across the community, [Free from violence](https://www.vic.gov.au/free-violence-victorias-strategy-prevent-family-violence) also focuses on research, monitoring, and evaluation.

Research has been undertaken in areas where there is less evidence and understanding, such as elder abuse, violence against people with a disability, and violence within LGBTIQ+ communities.

## Find out more

The [Public health and wellbeing progress report](https://www.health.vic.gov.au/publications/victorian-public-health-and-wellbeing-progress-report) also includes information on family violence prevention in Victoria.

The [Our Watch website](https://www.ourwatch.org.au/) also includes information on the drivers of violence against women.

The [Respect Victoria website](https://www.respectvictoria.vic.gov.au/) includes information on family violence prevention in Victoria.

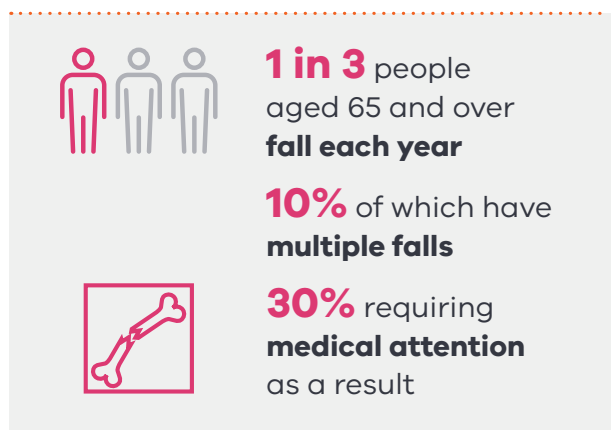


## Falls prevention among older Victorians

Falls are a leading cause of unintentional injury, disability, and death among older people.

### Rates of falls

Australian and international studies have identified that approximately one-in-three people aged 65 years and over fall each year, with 10 per cent having multiple falls and more than 30 per cent experiencing injuries requiring medical attention.



Falls can happen to anyone at any location, but falls requiring hospitalisation are more common among older people living independently in the community. Most falls are likely to occur in the home (AIHW, 2022).

### Impact of falls

The impact of falls and falls-related injury on the person, their family, and society, as well as on the health system, can be considerable (WHO, 2021; ANZFPS, 2022).

Even falls that do not cause a physical injury often cause an older person to lose confidence. This loss of confidence can lead to an ongoing fear of falling. Over time, this fear of falling can lead to their limiting their movement and reducing their activity, which further increases their risk of falling (Health Direct, 2022).

### Risk and protective factors for falls

An individual's risk of falls and falls-related injury and harm are complex and multifactorial (Close and Lord, 2022).

As people age, the risk of fall-related hospitalisation increases (Ambrose et al, 2015). However, it is internationally recognised that falls should not be considered a normal part of ageing (WHO, 2021).

Factors that increase the risk of falls include a history of falls, frailty, comorbidity (especially cardiac conditions, renal conditions, and diabetes), cognitive impairment, and sedentary lifestyles. Other factors include hazardous home environments, and uneven road and footpath environments, as well as socioeconomic factors such as social isolation, living in regional and remote areas, and limited availability or access to health services and aged care (WHO, 2021).

Protective factors include: a healthy and active lifestyle, behavioural change to maintain or uptake strength and balance, and exercise to maintain mental and physical function. Other protective factors include: reducing home slip and trip hazards through a home-safety assessment and modification by Occupational Therapists; reducing psychotropic medication; cataract surgery; maintaining bone health; and having regular optometry, podiatry, and hearing checks (Andersen et al, 2020).

## Data about falls in Victoria

Data from Monash University's Victorian Injury Surveillance Unit (VISU) shows that:

- In the period 2017–2019, falls accounted for three-quarters of injury-related deaths among older people (n=3,258, 75.1 per cent) in the period 2017–2019. A high proportion of fall deaths were coded as 'unspecified fall' (n=2,547; 78.2 per cent), while of those with a specified fall mechanism (n=711) more than half were falls on the same level from slipping, tripping or stumbling (n=385, 54.1 per cent). (Pham and Hayman, 2022)



**3 in 4 injury-related deaths** among older people were due to falls

- VISU reported in 2015 that the most common location of falls-related hospital admissions was the home (47.6 per cent), residential institutions (22.2 per cent), and other institutions including hospitals (1.8 per cent), whereas the most common location of falls-related Emergency Department (ED) presentations was the home (56.3 per cent), residential institutions (10.6 per cent) and other institutions including hospitals (1.2 per cent). The most common location for falls-related deaths was residential institutions (44.9 per cent), home (32.8 per cent), and other institutions including hospitals (9.6 per cent). (Stathakis et al, 2015).
- Falls-related hospital admissions, ED presentations, and deaths are expected to increase as the Victorian population ages.

## Prevention of falls

The Victorian Government adopts a strategic primary prevention approach to falls and fall-related injury prevention (DHHS, 2015).

### What local communities can do

Local government, community-based organisations, and seniors groups can prevent falls by taking action to ensure safe and age-friendly environments.

Safe-built environments are important to enable older people to live and move around independently and remain physically active, and ensure neighbourhoods and public spaces are safe, accessible, health-promoting and socially-inclusive environments for older people.

Prioritising older people as vulnerable road users in the design of local roads will reduce falls and transport-related injuries, while supporting older people to adopt active modes of transport, like walking and cycling.

Local government and community organisation partnerships and initiatives to enable older people's participation in physical activity are encouraged, such as providing seniors exercise parks, age-friendly walking paths and group exercise programs such as Tai-Chi. COTA's Living Longer Living Stronger strength and balance program also offers links to providers and instructors.

Age-friendly environments enable older people to remain healthy and independent and reduce the need for support services. For example, community organisations and local health services should support independence and ageing-in-place by fostering linkages between home-based support services for older people and referrals to local healthcare providers.

## What healthcare providers can do

Healthcare providers have an important role to play in openly discussing falls risk with older people, identifying risk factors, and tailoring appropriate prevention strategies and referrals.

Healthcare providers are encouraged to conduct falls-risk assessment with their clients to enhance early intervention and referral to appropriate prevention strategies. General Practitioners are encouraged to conduct falls risk assessment as part of routine 45-year-old and 75-year-old health checks, as well as for patients with chronic health conditions that carry increased falls risk. Health professionals can use the [Victorian Falls and Balance Service Directory](https://www.nari.net.au/victorian-falls-directory) <<https://www.nari.net.au/victorian-falls-directory>> to identify falls prevention services in their area.

Health and aged care services are encouraged to implement settings-based falls prevention initiatives to reduce the incidence of falls in hospital and residential aged care settings. Older People In Hospital provides evidence-based information and simple strategies to manage falls in hospitals, and can assist health services to meet the National Safety and Quality Health Services Standards (NSQHS). Falls prevention guidance for residential aged care facilities is also available as part of the NSQHS Standard 10 on Falls.

## What older people can do

Older people are encouraged to talk about all falls (including ones that didn't cause injury) with their partners, family, carers, GPs, and other health care providers, to help identify and address risk factors and to reduce the chance of repeat falls.

To prevent falls, older people should maintain their physical activity and participate in regular strength and balance exercises in their own home or in group exercise and recreational settings. [Videos on safe exercise at home for older people are available online](https://www.safeexerciseathome.org.au) <<https://www.safeexerciseathome.org.au>>. Such exercise offers other important benefits for bone density, flexibility and heart and lung fitness.

The ['Don't Fall for It. Falls can be prevented!' national booklet](https://health.gov.au/resources/publications/dont-fall-for-it-falls-can-be-prevented) <<https://health.gov.au/resources/publications/dont-fall-for-it-falls-can-be-prevented>> offers useful tips and strategies older people can do themselves to manage their own falls risk and prevention actions. The Better Health Channel provides advice to older people on 'Preventing falls at home', including what to do if you fall at home.

Older people are also encouraged to eliminate or reduce their use of ladders for home maintenance tasks and either seek assistance from friends and family, or visit [MyAgedCare](https://www.myagedcare.gov.au) <<https://www.myagedcare.gov.au>> for home maintenance assistance provided by local councils and local aged care service providers.

## Further resources

The National Ageing Research Institute in partnership with key stakeholders have created a [map of age-friendly outdoor spaces for older people to engage in physical and social activities](https://www.nari.net.au/enjoy) <<https://www.nari.net.au/enjoy>>.

Better Health Channel 'Preventing falls at home' <<https://betterhealth.vic.gov.au/health/healthyliving/falls-prevention-at-home>>, including what to do if you fall at home.

Council on the Ageing's Living Longer Living Stronger program <<https://www.cotavic.org.au/our-programs/strength-training/living-longer-living-stronger-providers>>.

National Ageing Research Institute, Falls Risk for Older People in the Community (FROP-COM) for community screening of risk of falls <<https://www.nari.net.au/frop-com>>.

Older People in Hospital falls prevention resources <<https://www.health.vic.gov.au/site-4/patient-care/older-people-in-hospital>>.

Australian Physiotherapy Association. Safe exercise in the home for older people (guidance and videos) <<https://www.safeexerciseathome.org.au/>>.

org.au/>.

## References

Andersen M, Ma T, Bhamuik S, et al. 2020, 'Synthesis of evidence for a technical package on falls prevention and management'. The George Institute for Global Health, Newtown, Australia. (Evidence Synthesis Report accompanying the WHO 2021 Step Safely resource). Available at: <<https://www.georgeinstitute.org/preventing-and-managing-falls-across-the-life-course>>.

Ambrose AF, Cruz L and Paul G 2015, 'Falls and fractures: a systematic approach to screening and prevention', *Maturitas*, vol. 82, no. 1.

Australia and New Zealand Falls Prevention Society (ANZFPS), 2022. Home page. Source: <<https://www.anzfallsprevention.org>>.

Australia's National Research Organisation for Women's Safety (ANROWS) 2016, 'A preventable burden: measuring and addressing the prevalence and health impacts of intimate partner violence in Australian women: Key findings and future directions', ANROWS, Sydney.

Australian Institute of Health and Welfare (AIHW). 2022, 'Injury in Australia: Falls'. Web report, 16 June 2022. Australian Government, available at: <<https://www.aihw.gov.au/reports/injury/falls>>.

Close JCT and Lord SR. 2022, 'Fall prevention in older people: past, present and future'. *Age and Ageing* 2022, 51:1-5. <<https://doi.org/10.1093/ageing/afac105>>.

Crime Statistics Agency, Family Violence Data Portal. Available at: <<https://www.crimestatistics.vic.gov.au/family-violence-data-portal/family-violence-data-dashboard/victoria-police>>.

Department of Health and Human Services 2019, 'Victorian public health and wellbeing plan 2019–2023', State Government of Victoria, Melbourne.

Health Direct 2022 'Falls and the elderly', <<https://www.healthdirect.gov.au/falls>>.

KPMG 2017, 'The cost of family violence in Victoria, summary report', <<https://www.vic.gov.au/sites/default/files/2019-05/Cost-of-family-violence-in-Victoria.pdf>>.

Our Watch 2021, 'Change the story: a shared framework for the primary prevention of violence against women in Australia' (2nd edition), Our Watch, Melbourne.

Pham TTL and Hayman J. 2022, 'Injury Deaths Victoria, 2017–2019'. E-Bulletin Edition 24. Injury Victoria, 2020/21. E-Bulletin Edition 25. Victorian Injury Surveillance Unit. Monash University Accident Research Centre, Clayton, Victoria. Available at: <[https://www.monash.edu/\\_data/assets/pdf\\_file/0008/2899781/405342\\_E-Bulletin24\\_deaths\\_Final-1.pdf](https://www.monash.edu/_data/assets/pdf_file/0008/2899781/405342_E-Bulletin24_deaths_Final-1.pdf)>.

Stathakis V, Gray S, Berecki-Gisolf J. 2015, 'Hazard edition no. 80: Fall-related injury profile for Victorians aged 65 years and older'. Victorian Injury Surveillance Unit, Monash University Accident Research Centre, Clayton Victoria. Available at: <<https://www.monash.edu/muarc/research/research-areas/home-and-community/visu/hazard>>.

Victorian Government 2017 'Ending Family Violence: Victoria's Plan for Change',

Victorian Injury Surveillance Unit 2018, 'Victorian Admitted Episodes Data (VAED), VISU-held Cause of Death (COD) dataset', supplied by the Australian Coordinating Registry (ACR) and based on the Australian Bureau of Statistics (ABS) cause of death data.

World Health Organization 2007, 'WHO global report on falls prevention in older age', World Health Organization, Geneva.

World Health Organization 2021, 'Step Safely: strategies for preventing and managing falls across the life-course'. World Health Organization, Geneva.



# Chapter 17 – Oral health

Oral health is fundamental to overall health, wellbeing and quality of life. It is an important part of general health, affecting not only the individual, but also the broader health system and economy.

There have been significant improvements in oral health in Australia over the last 30 years. These improvements are largely due to improved access to fluoridated drinking water, the use of fluoride toothpastes, the provision of preventive oral health services, and the adoption of good oral hygiene practices.

However, certain population groups still experience significant oral disease and the affordability of dental care is still an issue for some Victorians.

## Child oral health

### Child dental caries (tooth decay) experience

Tooth decay is the most prevalent disease in Victoria.

Almost half of all children (43 per cent) aged between five and 10 years have signs of tooth decay (Do and Spencer, 2016). Dental conditions are the highest cause of all potentially preventable hospitalisations in children 0 to 9 years, predominantly because of tooth decay (Department of Health, 2019).



Dental conditions are the highest cause of potentially **preventable hospitalisations** in children

There are two key pieces of data which illustrate the dental caries (tooth decay) experience of Victorian children.

One piece of data relates to the average number of decayed, missing or filled (deciduous/baby) teeth (also known as a DMFT score) in five- and six-year-old children. In 2012–14, Victorian five- and six-year-olds had an average DMFT of 1.3. This was only slightly lower than that reported in the late 1980s (Do and Spencer, 2016).

The second piece of data relates to the average number of decayed, missing, or filled (permanent / adult) teeth (also known as a DMFT score) in 12-year-old children. In 2012–14, Victorian 12-year-olds had an average DMFT of 0.8. This represents a significant reduction from the late 1980s, when the corresponding figure was approximately 1.8 (Do and Spencer, 2016).

The data for five and six-year-old children indicates that a greater focus on enhancing oral health promoting environments, increasing the oral health literacy of families, and providing resources and services for pre-school children is required to help prevent tooth decay in children.

Sugar in foods and drinks are the key dietary cause of tooth decay. The Victorian Child Oral Health Survey found that 4-in-10 Victorian children consume one or more sugary drinks on a usual day and almost half of Victorian children are eating four or more sugary foods/snacks every day (Do and Spencer, 2016).

The School Dental Program and prevention initiatives such as the Smiles 4 Miles, Healthy Families Healthy Smiles and Fluoride Varnish programs are being implemented to improve the oral health of children.

## Adult oral health

### Adult dental caries (tooth decay) experience

Adults also benefit from water fluoridation and fluoridated toothpastes.

Despite these advances, more than 90 per cent of Victorian adults have had or currently have dental caries, with one-in-three (32 per cent) experiencing untreated dental caries (Australian Research Centre for Population Oral Health, 2019).

Adult dental caries experience increases with age (Australian Research Centre for Population Oral Health, 2019).

### Gum disease

Adults can also be impacted by gum diseases, which tends to affect adults more than children.

In 2017–18, a total of 27.7 per cent of Victorians were found to have moderate to severe periodontitis (gum disease), with more than 70 per cent of those aged over 75 years of age experiencing moderate to severe periodontitis compared to 10.2 per cent of Victorians aged between 15 to 34 (Australian Research Centre for Population Oral Health, 2019).

### Adult self-reported dental health

The Victorian Population Health Survey asks respondents to rate their dental health.

In 2017, 37.2 per cent of people rated their dental health as excellent or very good, while 34 per cent rated their dental health as good.

A further 24.4 per cent rated their dental health as being fair or poor (Victorian Population Health Survey, 2017).

### Oral cancer

Oral cancer (ICD codes WHO) is one of the leading causes of disease burden in Victoria, with an average of 16 new diagnoses each week. In 2019, there were 853 new cases and 190 oral cancer deaths in Victoria (Cancer Council Victoria, 2020).

Oral cancer, which may affect the lips, tongue, salivary glands, gums, mouth, or throat (oropharynx) is the tenth most common cancer in Victoria. It is the eighth most common cancer in men, the fourteenth most common cancer in women and is more common among older age groups.

The three most common oral cancers in 2019 were tongue, oropharynx, and salivary glands (Cancer Council Victoria, 2020).

The risk of oral cancer is associated with lifestyle exposures such as tobacco, alcohol, and human papillomavirus (HPV) infection.



## Cost of dental care

The Victorian Population Health Survey also seeks information about avoidance or delaying a visit to a dental professional due to cost. Overall, 33.9 per cent of Victorians reported they had avoided or delayed visiting a dental professional due to cost (Victorian Population Health Survey, 2017).

The National Study of Adult Oral Health found that just over 57 per cent of Victorian adults reported making a visit to a dentist in the last 12 months. The study also found that 23 per cent of adults reported considerable difficulty paying a \$200 dental bill and 1-in-5 adults reported foregoing recommended dental treatment due to cost.

Overall, the use of dental services is declining and avoiding or delaying care due to cost is increasing (Australian Research Centre for Population Oral Health, 2019).

## References

Ambulatory Care Sensitive Conditions, Victorian Health Information Surveillance System (VHISS); Department of Health, Government of Victoria, Melbourne 2019.

Australia's Oral Health: The National Study of Adult Oral Health 2017–18, Australian Research Centre for Population Oral Health (ARCPOH), Adelaide; The University of Adelaide, South Australia.

Do LG & Spencer AJ 2015, 'Oral health of Australian children: the National Child Oral Health Study 2012–14'. Adelaide: University of Adelaide Press.

Victorian Population Health Survey 2017, Department of Health, Government of Victoria, Melbourne.

ICD codes: C00, C01-C10, C14; WHO. International Classification of Disease for Oncology. Available at: <<http://codes.iarc.fr/topography>>.

Victorian Cancer Registry 2020, 'Cancer in Victoria 2019'. Cancer Council Victoria. Melbourne, Victoria.

