



Your health

Report of the Chief Health Officer,
Victoria, 2020 and 2021

OFFICIAL

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In this document, 'Aboriginal' refers to both Aboriginal and Torres Strait Islander people.

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Message from the Chief Health Officer

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, 2020 and 2021*.

This is the ninth report published by the Chief Health Officer in Victoria, and the first since I began in the role in 2023.

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 2020 and 2021.

This period presented profound public health challenges to Victoria, Australia and indeed the world as the outbreaks of a novel coronavirus took hold in what was to become the COVID-19 pandemic. The world had not experienced such an extensive communicable disease outbreak since the Great Influenza Pandemic of 1918–1920.

COVID-19 would go on to challenge public health significantly throughout 2020, 2021 and the following years. The public health response of the Victorian Department of Health and the broader Victorian Government was unprecedented. Health services, businesses, education settings, community organisations and others had to make significant changes to the ways in which they operated. I particularly want to acknowledge the incredible way Victorians followed the public health directions to help minimise the spread of COVID-19 and help keep us all safe. It was a profoundly difficult time for all Victorians.

This Chief Health Officer report, therefore, includes a large chapter covering the key aspects of the COVID-19 pandemic. It summarises the impacts of the pandemic itself on the health and wellbeing of Victorians as well as the impacts of the public health response. As well as population-level data and information, it also includes first-person stories from patients with COVID-19, health service staff, families navigating working and learning from home and others to provide more personal insights into the impacts of the pandemic.

While the COVID-19 pandemic was a huge focus, other public health challenges arose throughout 2020 and 2021. The ongoing impact of climate change on public health was felt in early 2020 as the catastrophic bushfires that began in late 2019 continued. The direct impacts of these bushfires led to the deaths of Victorians and serious loss of life for native flora and fauna.

Smoke from these fires impacted air quality leading to increases in hospitalisations and emergency department presentations for respiratory conditions. We also saw climate change play out in other ways as extreme rainfall events and associated flooding, with subsequent effects on health and wellbeing. It is therefore imperative that we all continue our efforts to tackle climate change and mitigate its effects.

Other public health challenges that occurred in 2020 and 2021 included ongoing antimicrobial resistance and the impacts of mosquito-borne disease. These demonstrate the importance of health authorities and communities being prepared for multiple, concurrent public health challenges in the years ahead.

Your health: Report of the Chief Health Officer, Victoria, 2020 and 2021 also includes data and information on the topics included in previous reports. Information on mental health, maternal and child health, communicable diseases, non-communicable diseases (including cancer), food and water safety, oral health and other health and wellbeing matters are also discussed.

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



Dr Clare Looker
Chief Health Officer

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About this report

***Your health 2020–2021* is the ninth in a series of Chief Health Officer reports that began in 2005. The report of the Chief Health Officer is a key publication from the Department of Health that provides a summary of key public health and wellbeing indicators in Victoria. This report has a special focus on the COVID-19 pandemic response in Victoria in 2020 and 2021.**

These reports are typically released every 2 years and have 4 key objectives:

- to profile the health status and health needs of the Victorian population
- to document and understand trends in key health indicators
- to profile key social and community factors that affect health outcomes
- to inform the public health agenda in Victoria.

Previous reports can be found on the department's [Your health – biennial report webpage](https://www.health.vic.gov.au/population-health-systems/your-health-biennial-report) <<https://www.health.vic.gov.au/population-health-systems/your-health-biennial-report>>.

Data and terminology considerations

References to 'the department' in this report refer to the (Victorian) Department of Health and its predecessor department, the (Victorian) Department of Health and Human Services.

References to 'COVID-19' refer to the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a strain of coronavirus that causes COVID-19, the respiratory illness responsible for the COVID-19 pandemic. Note that COVID-19 data reflect surveillance data at the time of publication. As information across data bases may be updated or reclassified, there may be small differences between figures in this report and those released at other times.

For COVID-19 hospitalisation data, these may not be a comparable indicator of severity from wave to wave due to differing reasons (for infection prevention and control instead of management of disease) and thresholds for hospitalisation, and health service capacity.



Key public health challenges

As the world celebrated the new year on 1 January 2020, Victoria, and much of Australia, had just experienced some of the most intense bushfires in its history. Record-breaking temperatures had contributed to prolonged and catastrophic fire events, which persisted well into 2020. The health and wellbeing impacts of bushfires are significant and include the direct health impacts of fire and bushfire smoke to broader impacts associated with loss of property, livestock and habitat and the mental health consequences that can follow such devastating events. The public health impacts of these bushfires were documented in the *Your health: Report of the Chief Health Officer, Victoria, 2019* <<https://www.health.vic.gov.au/population-health-systems/your-health-biennial-report>>.

Even before these bushfires had been extinguished, the world was starting to see reports of an emerging new virus. In very late 2019, reports were coming from China of outbreaks of an atypical pneumonia-like illness that did not respond well to standard treatments. Within the first week of 2020, public health officials had identified a novel coronavirus, commonly known as COVID-19, as the cause of these outbreaks (CDC, 2019).

Extreme weather events, climate change and concurrent emergencies including COVID-19

Public health challenges never occur in isolation. The collision of an extreme bushfire event and the beginnings of the COVID-19 pandemic demonstrate the complexity of threats that individuals, communities, health authorities and governments will increasingly face into the future.

Victoria again experienced concurrent large-scale emergencies with significant storm and flooding activity in June and October/November 2021 in the midst of the ongoing emergency response to COVID-19. Public health threats are rarely static. Public health events evolve over time, with changing health and social impacts. While the bushfires initially affected communities in rural and regional areas of Victoria and on the fringes of Greater Melbourne, as the bushfires continued burning, all residents in Melbourne were affected by bushfire smoke for many days. With the COVID-19 pandemic, we saw the virus evolve into different variants of concern: Alpha, Delta and Omicron, each having different public health impacts. This change over time shows the importance of ongoing surveillance and other oversight activities to ensure response activities are robust and meet their mark.

One of the key drivers of public health challenges is climate change. Climate change risks and impacts are increasingly becoming more complex and difficult to manage and, in future, multiple climate hazards will increasingly occur at the same time. Multiple climatic and non-climatic risks will interact, resulting in compounding overall risk and risks cascading across regions and sectors (Intergovernmental Panel on Climate Change, 2022).

One Health and antimicrobial resistance

Antimicrobial resistance (AMR) occurs when microorganisms (bacteria, fungi, viruses and parasites) develop resistance to antimicrobial substances such as antibiotics.

AMR is a significant health challenge in Australia and across the world. When microorganisms are not killed by usual antimicrobials, an infection becomes much harder to treat. This increases the risk of severe illness in the individual and the risk of the infection spreading to other people. AMR can spread between people, animals and the environment, with potentially significant impacts on each.

The collaboration between multiple sectors, working together to achieve better health outcomes for humans, as well as animals and the broader environment, is known as the 'One Health' approach (WHO, 2017). In the context of AMR, this transdisciplinary approach – working at the local, regional, national and global levels – is required to achieve the best health outcomes by recognising and leveraging the interconnection between people, animals, plants and their shared environment (CDCP, 2023).

Climate change, population growth, international travel and the global economy are all intertwined challenges that are amplifying the consequences of AMR and communicable disease threats more broadly. Antibiotic use and misuse, and the detection of resistant organisms in the animal, food production and the environment sectors, has the potential to cause economic loss and ultimately affect human and animal health.

Tackling AMR requires a collaborative approach between all sectors, with human, animal and environmental health playing equally important roles in this space. Victoria is playing a lead role in Australia in implementing effective surveillance systems for AMR in humans, and there is increasing collaboration between sectors to identify common priorities and find solutions to minimise the impact of AMR.

To address knowledge gaps relating to AMR in the water cycle, the department worked with Water Research Australia, regulators, researchers, the water sector and water agencies to fund a project looking at 'A national approach to tackling antimicrobial resistance in the water cycle'. The outcomes of this project helped inform risk assessments, water quality monitoring activities and research priorities.

Mosquito-borne disease

Another example of extreme weather events affecting public health can be found in the worst floods in a decade being recorded in the southwest of Victoria affecting Moyne, Southern Grampians and Warrnambool local government areas in early October 2020. Average monthly rainfall for the region fell over a 2-day period, leading to the Moyne River flooding onto low-lying surrounding land. A natural disaster-declared area for the 3 local government areas was announced in subsequent days.

The warm temperatures with the approaching summer led to ideal mosquito breeding habitats forming. Mosquito populations expanded as flood waters began to recede. The enhanced mosquito populations likely led to an increase in Ross River virus amplification in host animal populations (kangaroos and wallabies) across the region. This amplification eventually affected human populations, leading to significantly higher notifications of Ross River virus to the department in late 2020 and well into 2021.

In response to these and other mosquito-related events, the department worked with impacted local councils and provided advice on the best control methods to reduce mosquito numbers and potential transmission of mosquito-borne diseases. In both 2020 and 2021, Chief Health Officer alerts advised residents and tourists in affected areas to take precautions against mosquito bites.



Mosquito-borne disease is discussed more in the 'Communicable disease' chapter.

Buruli ulcer

Victoria has some of the highest rates of Buruli ulcer in the world. During 2020 and 2021 there was an ongoing expansion in areas of the state where Buruli ulcer was acquired. Buruli ulcer (also known as Bairnsdale or Daintree ulcer) is an infection of skin and soft tissue caused by the environmental pathogen *Mycobacterium ulcerans* (Boyd et al., 2012). Although generally not fatal, Buruli ulcer can result in long-term cosmetic and functional deformity if effective treatment is unavailable or delayed (Johnson, 2019). Early recognition, diagnosis and treatment can minimise the progression of symptoms (Boyd et al., 2012).

The bacteria that cause Buruli ulcer have been found in mosquitoes, faeces from some possum species, and vegetation in areas where there are cases of Buruli ulcer. It is thought that mosquitoes and possums have a role in transmitting the disease (Fyfe et al., 2010; Johnson et al., 2007).

Despite ongoing public health measures Buruli ulcer case numbers across 2020 and 2021 remained largely unchanged. Some areas in Victoria are now endemic for Buruli ulcer, including popular holiday destinations such as the Mornington Peninsula.

Two particular trends emerged during the pandemic:

- the overall proportion of cases suspected to have been acquired in holiday areas or through travel to other endemic areas declined, likely due to less travel
- new areas were declared endemic for Buruli ulcer including several inner Melbourne suburbs.



Buruli ulcer is discussed more in the 'Communicable disease' chapter.

Avian influenza

Avian influenza, commonly known as 'bird flu' is typically an infectious disease of birds and is caused by several different strains of the avian influenza virus.

In 2020 Victoria experienced a large avian influenza outbreak in several regional areas, with egg, poultry and emu farms being affected.

In response to this large avian influenza outbreak the department worked with Agriculture Victoria, the lead agency responding to the poultry outbreak. The department assessed the risks to human health, provided advice and coordinated measures to protect public health.

This included advice for people who had been in contact with infected birds to monitor for symptoms, facilitating testing and medical assessment, providing prophylactic medication and vaccines. No human cases of avian influenza were identified during this outbreak.

The response to the avian influenza outbreak in 2020 occurred during the COVID-19 pandemic, posing extra challenges for:

- providing advice
- implementing COVID-19 control measures
- providing the human resources required to control the outbreak over an extended period of time.



Avian influenza is discussed more in the 'Communicable disease' chapter.

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Victorians – who we are

Key statistics

With a population of 6.56 million in December 2021, Victoria was Australia's second-most populous state after New South Wales (ABS, 2022a).

Victoria represents approximately one-quarter of Australia's population (ABS, 2022b).

In 2020 Victoria's population growth slowed, which likely reflects large outflows of international and interstate migration (ABS, 2021a).

Victorians' life expectancy at birth is 81.7 for males and 85.7 for females (ABS, 2022c).

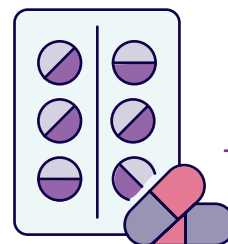
Victorians' life expectancy at birth is



The proportion of Victorian adults who reported being in excellent or very good health was 40.5%, while 21.4% of Victorians reported having fair or poor health (VAHI, 2022).

According to a 2021 census, 31.4% of Victorians are living with one or more long-term health conditions (ABS 2022d).

According to a 2021 census



31.4%
of Victorians
are living with one or more
long-term health conditions



The long-term health conditions of Victorians are discussed more in the 'Non-communicable disease' chapter.

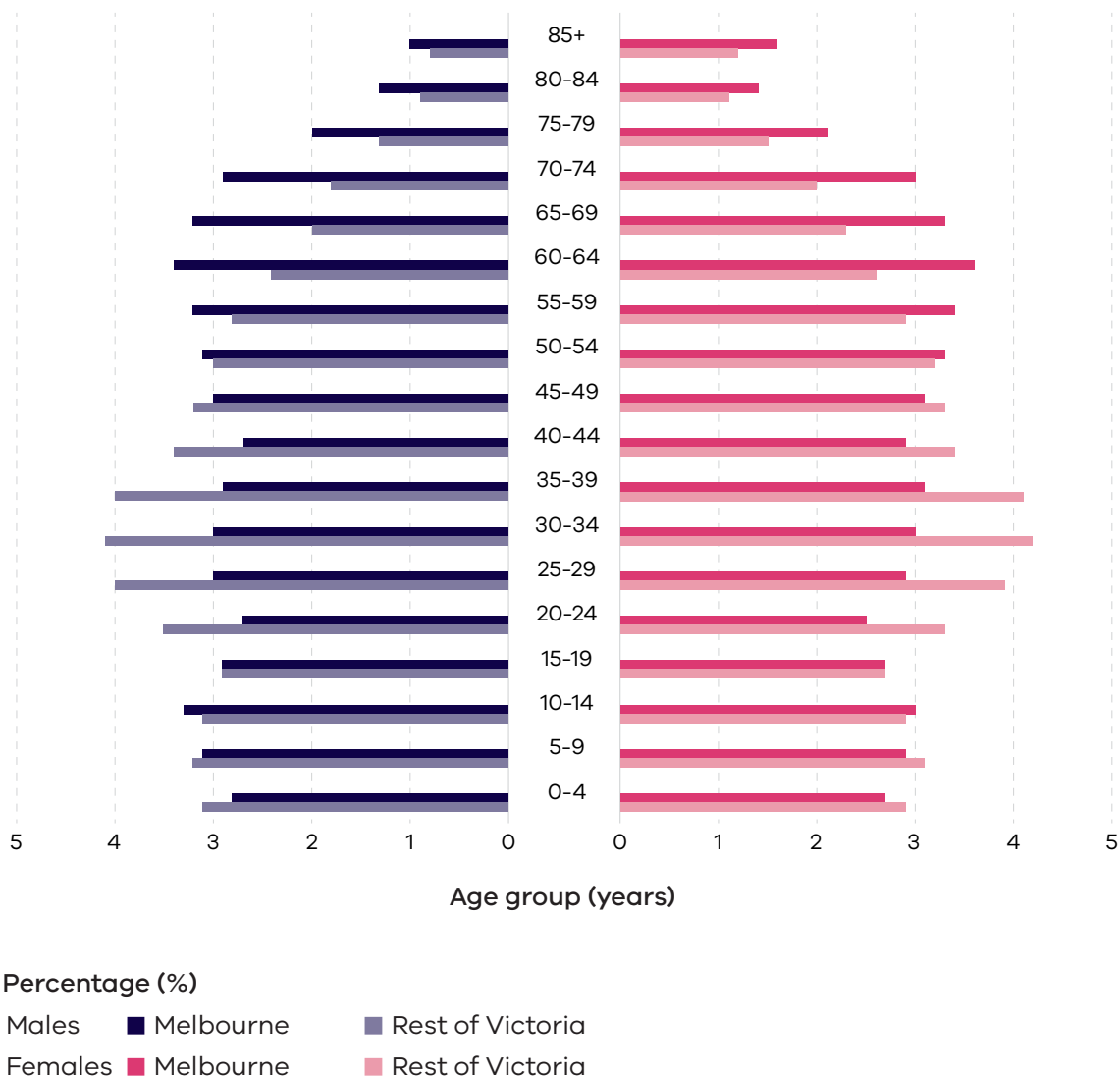
Age and sex distribution

Of the estimated 6.56 million people in Victoria in 2021, there were slightly more females (50.5%) than males (49.5%) (ABS, 2022e) (Figure 1).

Victorians who live in Greater Melbourne tend to be younger than those in regional areas, as younger adults tend to migrate out of regional areas to pursue work and education in the capital city (ABS, 2021a; ABS 2022e).

Overall, Victoria had a median age of 38 years in 2021 (ABS, 2022f).

Figure 1: Age and sex distribution in Victoria, 2021



Aboriginal 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 2021, 65,646 Aboriginal people made up the Victorian Aboriginal community, totalling approximately 1.0% of the Victorian population (ABS, 2022g).

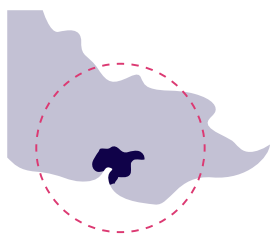
Aboriginal people living in Victoria are a young demographic, with 94% aged between 0 and 64 years (ABS, 2022g).



Aboriginal health in Victoria is discussed more in the 'Health inequalities' chapter.

Rural and regional Victorians

Akin to most state and territories, Victoria is largely an urbanised state, with 74.9% of people living in Greater Melbourne and 25.1% living in regional and rural Victoria (ABS, 2021b; ABS 2022a).



74.9%
of Victorians live in
Greater Melbourne, with
25.1% living in regional
and rural Victoria

Rural and regional Australia includes many diverse locations and communities. People who call these areas home can face unique challenges due to their geographical location, often having poorer health outcomes than their metropolitan counterparts. People living in rural and regional areas have been shown to have higher rates of hospitalisations, deaths, injury as well as poorer access to, and use of, primary health care services (AIHW, 2024).

Cultural diversity

Victoria is one of the most culturally diverse societies in the world, with more than 1.7 million Victorians speaking a language other than English. It is also among the fastest growing and most diverse states in Australia (Victorian Government, 2021).

Victorians come from more than 300 ancestries, speak 290 languages and dialects, and follow almost 200 different religious faiths (ABS, 2022h).

According to the 2021 Census (ABS, 2022b):

- 65% of Victorians were born in Australia
- 52.2% of Victorians had either one or both parents born overseas.

Table 1 shows country of birth of Victorians according to the 2021 Census. After Australia, 4% of Victorians were born in India, with smaller proportions from England, China, New Zealand and Vietnam (ABS, 2022b).

When it comes to languages spoken at home, 67.2% of Victorians only speak English, with approximately one-third of Victorians speaking a language other than English. The top 5 languages other than English in 2021 were Mandarin, Vietnamese, Greek, Punjabi and Italian (ABS, 2022h).

Table 1: Common countries of birth for Victorians, 2021

Country of birth	Number	Percentage
Australia	4,228,667	65.0
India	258,193	4.0
England	174,552	2.7
China (excludes SARs and Taiwan)	171,447	2.6
New Zealand	99,344	1.5
Vietnam	93,598	1.4

Household incomes

Income and the distribution of money has a significant impact on health.

In Victoria, 15.2% of households reported a combined income of less than \$40,000 a year, while 27.7% of households reported a combined income of more than \$125,000 (VAHI, 2022) (Table 2).

Women were more likely to report a household income of less than \$40,000 (16.0% compared with 13.8) and less likely to report a household income of more than \$100,000 (24%) compared with men (32.2%) (VAHI, 2022).

Table 2: Crude prevalence of household income by gender, Victoria, 2019

Total annual income (\$)	Males (%)	Females (%)	Total (%)
< 40,000	13.8	16.0	15.2
40,000 – < 80,000	21.7	23.4	22.7
80,000 – < 125,000	19.6	18.7	19.1
> 125,000	32.2	24.0	27.7

i The link between low household income and lower levels of physical and mental wellbeing is discussed more in the 'Health inequalities' chapter.

Who we are – chapter references

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COVID-19 pandemic

COVID-19 pandemic – chapter structure

This chapter on COVID-19 discusses the first 2 years of the pandemic: 2020 and 2021. During this time, there were 3 distinct waves characterised by differing levels of transmission as well as a significant period between the second and third waves. These waves and the significant interwave phase are discussed in detail in the following sections:

- international context
- overview of the COVID-19 pandemic in Victoria: 1 January 2020 to 31 December 2021
- first wave: 25 January to 25 May 2020
- second wave: 26 May to 27 November 2020
- interwave phase: 28 November 2020 to 11 July 2021
- third wave: 12 July to 31 December 2021.

Each wave and phase is introduced by a 'data and key points' summary that sets out the critical impacts of that period. This includes the number of cases, hospitalisations and intensive care admissions and deaths. It also summarises key activities undertaken as part of the pandemic response.

Following this, further discussion of key events and activities is provided, including their impact on health and wellbeing. Given the enormity of the pandemic and the public health response, not every aspect of the pandemic or the response is captured in this chapter. Furthermore, impacts of the pandemic and the response that persisted throughout this period may only be discussed in detail in one wave or phase.

International context

Before the first Australian cases of COVID-19 were identified in late January 2020, established outbreaks of extensive local transmission were occurring in a number of countries overseas.

There were several reasons why COVID-19 was raising profound concerns for health authorities around the world: the direct health impacts were caused by a virus not previously seen in humans, and as such, there was initially no immunity in the population (AIHW, 2021a). There was no vaccine or specific treatment available at the start of the pandemic. The COVID-19 virus was also highly infectious and could cause severe illness and death (AIHW, 2021a).

In China, with rising cases and deaths, authorities placed Wuhan – a city of 11 million people – under stringent public health restrictions on 23 January 2020 to help contain the outbreak (CDC, 2020).

Over the next few weeks, significant local transmission occurred in a number of European countries as well as in India, Iran and the United States (CDC, 2020). Many healthcare systems were overwhelmed. In Italy, authorities described the outbreak there as the most serious event in Italian history since World War II (Indolfi and Spaccarotella, 2020). This crisis was so severe that the Italian Government became the first to implement national restrictions on 23 February 2020 (CDC, 2020).

With its health system struggling to provide care to all who needed it, Italian authorities were reporting a case fatality rate – that is, the proportion of people infected with the virus who die – at 9%. This was higher than the same rate reported in China (Indolfi and Spaccarotella, 2020). Rapidly increasing case numbers were also identified in other countries, particularly Iran and South Korea, with their health systems also facing overwhelming demands (Department of Health and Aged Care, 2020b).

In late January 2020 the World Health Organization declared the 2019 novel coronavirus outbreak a Public Health Emergency of International Concern (CDC, 2020). On 11 March 2020 the World Health Organization upgraded this declaration to a pandemic (WHO, 2020a).

Early Australian responses to the pandemic

Against this backdrop of overseas health systems facing or experiencing overwhelm, and the lack of effective therapy or vaccine and uncertainty around health impacts, Australia's Chief Medical Officer Professor Brendan Murphy added 'human coronavirus with pandemic potential' to the *Biosecurity (Listed Human Diseases) Determination 2016* on 21 January 2020. This led to:

- standing up the National Incident Centre and the National Medical Stockpile
- organising daily meetings of the Australian Health Protection Principal Committee
- coordinating meetings of state, territory and Commonwealth health ministers to discuss pandemic readiness (Department of Health and Aged Care, 2024).

The first Australian case was identified on 25 January 2020 in a returned overseas traveller who had arrived in Melbourne on 19 January 2020 (Department of Health and Aged Care, 2020a). On the same day, 3 cases in New South Wales were also detected (2 returned travellers from Wuhan and one close contact of the travellers).

In late January and throughout February 2020, Australia introduced a number of border measures to help delay entry of COVID-19 into Australia and to buy time for health sector and societal preparedness (Department of Health and Aged Care, 2020c).

On 16 March 2020 a State of Emergency was declared in Victoria. The Chief Health Officer issued the first directions restricting mass gatherings and enforcing self-quarantine after travel. Then Premier Daniel Andrews announced that 'this would be in force for the next four weeks to assist with measures designed to "flatten the curve" of COVID-19 and give our health system the best chance of managing the virus' (Premier of Victoria, 2020a).

Also at this time, other states and territories enacted public health emergency powers through their own legislative frameworks (Parliament of Australia, 2020). In Victoria, the relevant Act was the *Public Health and Wellbeing Act 2008*.

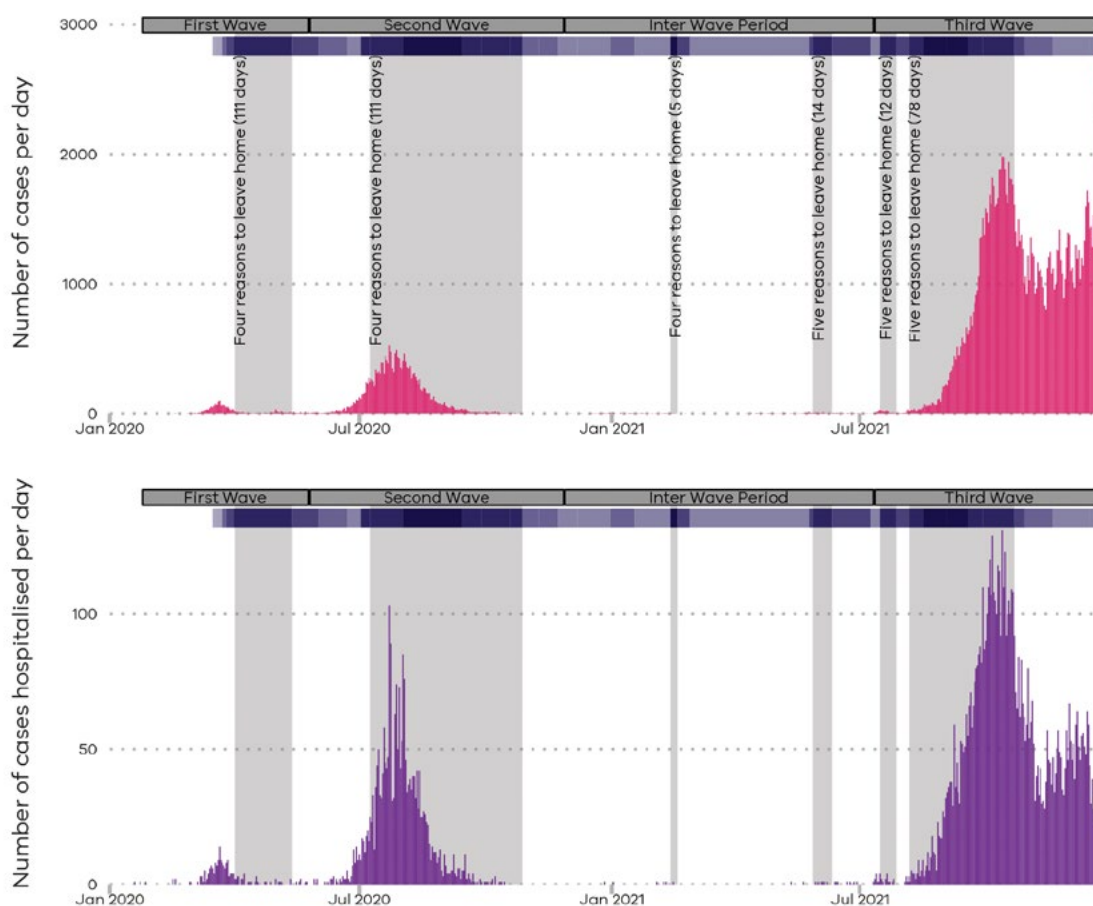
On 20 March 2020 the Australian border was closed to all non-citizens and non-residents. On 27 March 2020 National Cabinet announced that all international arrivals must complete 14 days of hotel quarantine (Senate Select Committee on COVID-19, 2020).

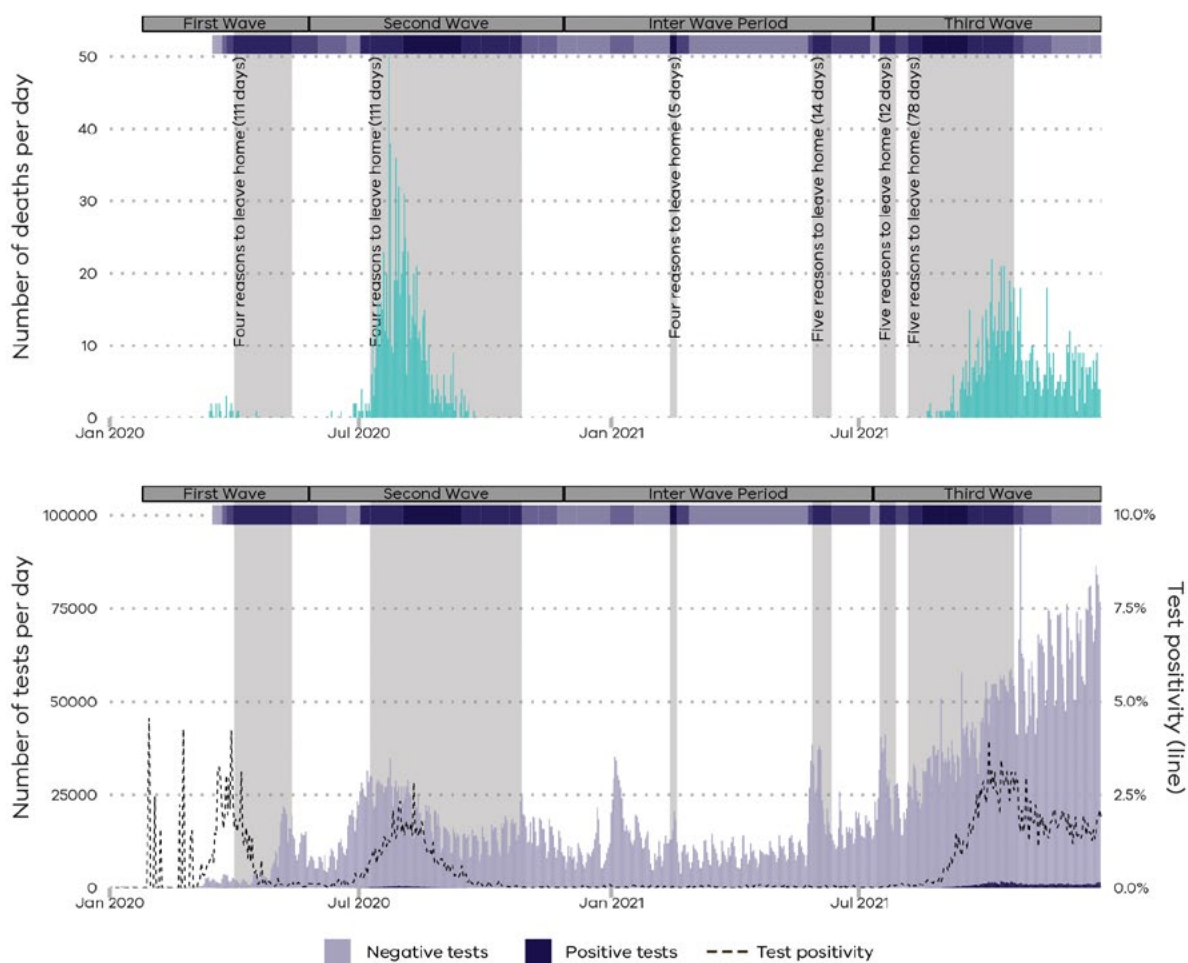
Overview of the COVID-19 pandemic in Victoria: 1 January 2020 to 31 December 2021

The first 2 years of the COVID-19 pandemic saw significant changes to the lives of Australians and, indeed, to people across the globe. In addition to the direct health and wellbeing impacts of the COVID-19 virus, the public health and social measures introduced to limit virus transmission and help protect the community brought in major changes for individuals, families, organisations, education settings, healthcare services and businesses.

The number of cases, hospitalisations, deaths and tests conducted throughout 2020 and 2021 and the stringency of public health and social measures are summarised in Figure 2.

Figure 2: Overview of key COVID-19 metrics in Victoria, 1 January 2020 - 31 December 2021: cases, hospitalisations, deaths and tests





Daily case notifications and deaths are shown with restrictions periods shaded (grey) and stringency of restrictions in metropolitan Melbourne shaded (darker colours indicate more stringent restrictions).

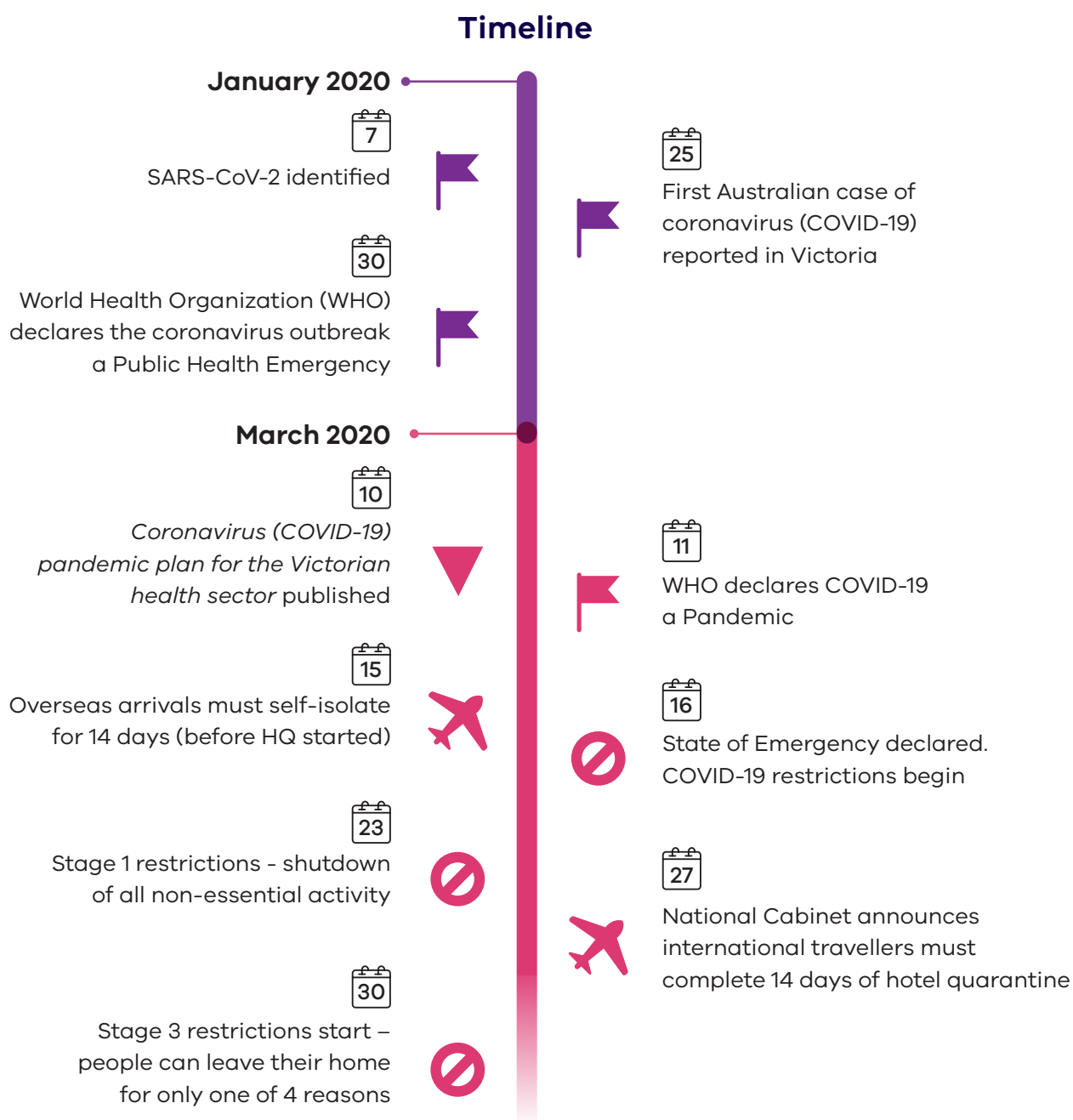
Metric	Restrictions stringency	Stay-at-home restriction periods
Cases	1 (Least)	Stay-at-home restrictions
Hospitalised cases	2	
Deceased cases	3	
Not detected	4	
Detected	5	
	6 (Most)	

Figure 2 shows that during this 2-year period, in Victoria there were:

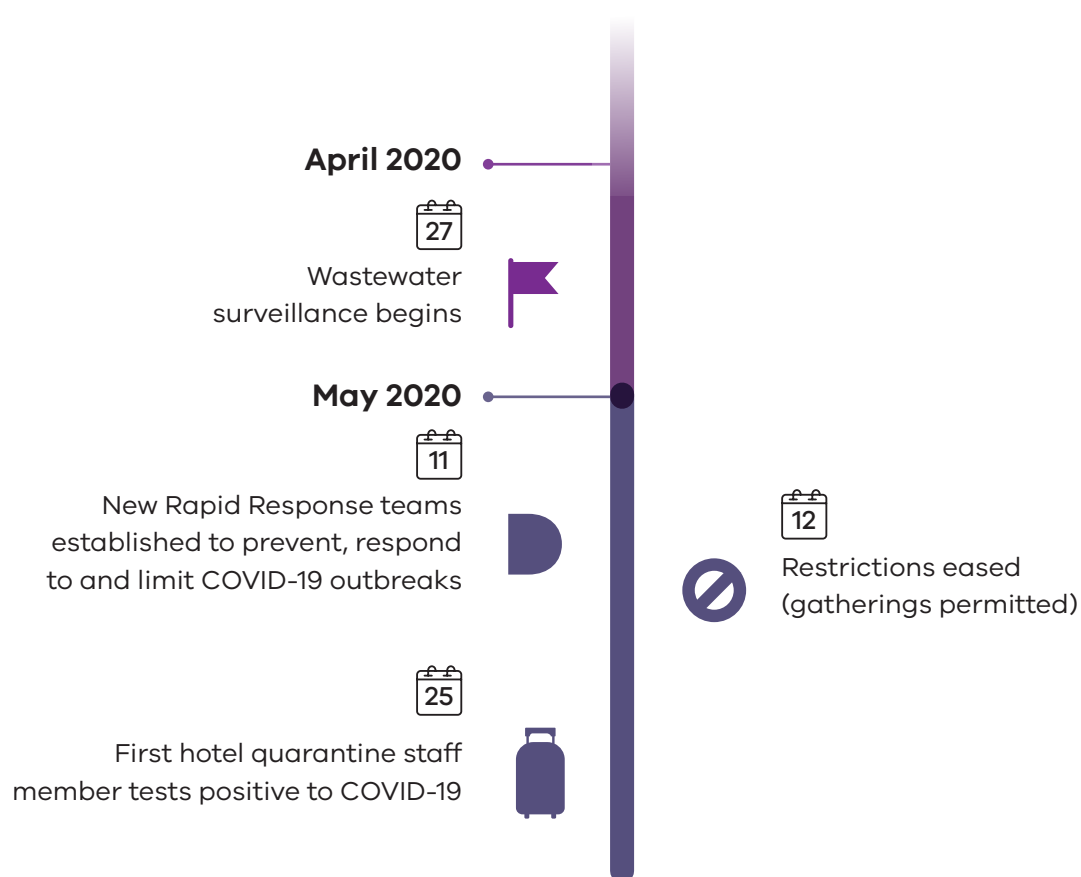
- 219,385 cases of COVID-19
- 10,343 cases of COVID-19 hospitalised
- 1,786 deaths from COVID-19
- 14,683,301 COVID-19 tests undertaken.








Each wave and the significant interwave period following the second wave are discussed on the following pages.

Early pandemic – first wave



Key							
	Key point	Restrictions	Testing	Travel	Hotel quarantine	Department of Health	Victorian Government



Key							
	Key point	Restrictions	Testing	Travel	Hotel quarantine	Department of Health	Victorian Government

First wave: 25 January to 25 May 2020

Data and key points

The first wave started with the first case diagnosed in Victoria and ended on 25 May 2020. In total, 1,642 cases of COVID-19 are known to have occurred in Victoria in this period.

Epidemiological summary

The initial rise in COVID-19 cases in March and April was followed by a relatively sharp decline in May as community transmission was minimised with stringent public health and social measures (Figure 3).

Demographics

- The median age of COVID-19 cases in Victoria was 44.5 years.
- 52.6% of cases were male.
- People contracting the virus tended to live in areas of less socioeconomic disadvantage, with 33% of cases living in the least disadvantaged areas of the state and 13% in the most disadvantaged areas.
- 82% of cases were residents of metropolitan Melbourne, with 14% residents of regional areas of the state and 3.5% interstate residents.
- 11% of cases (118 people) were healthcare workers.

Epidemiological characteristics

- 53% of reported infections were acquired overseas, a greater proportion than was seen in other waves. By early April, there were fewer overseas-acquired cases than locally acquired due to the impacts of border closures and isolation/quarantine requirements for returned travellers. 10% of cases were acquired locally with an unknown source.
- 93% of cases reported symptoms at the time of testing.

Outcomes

- 194 cases were hospitalised (11.8% of all cases). The median age of hospitalised cases was 61 years.
- 44 cases were admitted to an intensive care unit and 22 were ventilated.
- 19 COVID-19 deaths were reported (1.2% case fatality rate). The median age of those who died was 80 years.

Testing

- COVID-19 was made a notifiable condition on 28 January 2020 requiring all suspected and confirmed cases to be notified to the Department of Health and Human Services by both medical practitioners and laboratories.
- 475,175 polymerase chain reaction (PCR) tests were processed in this wave.

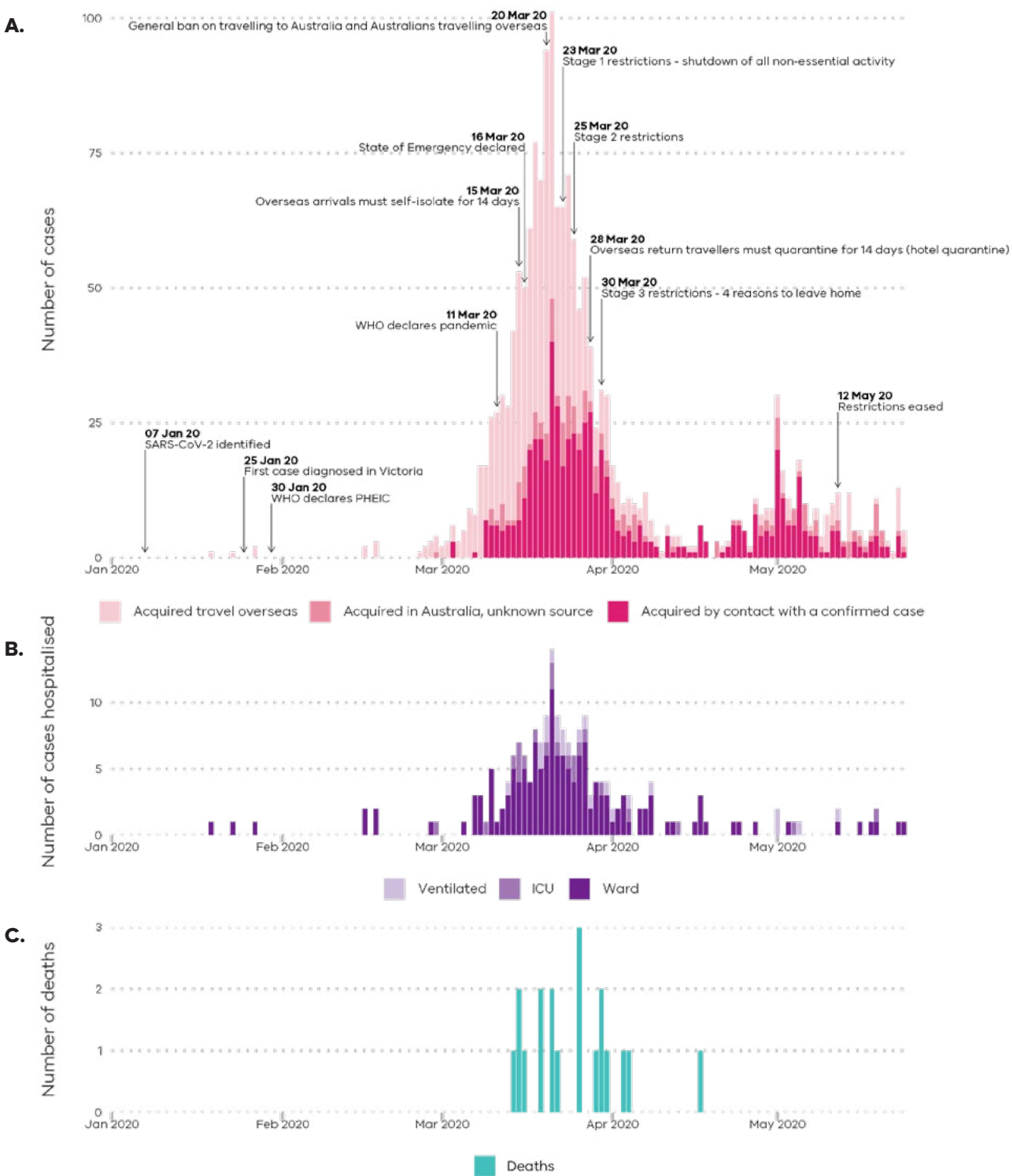
International comparisons

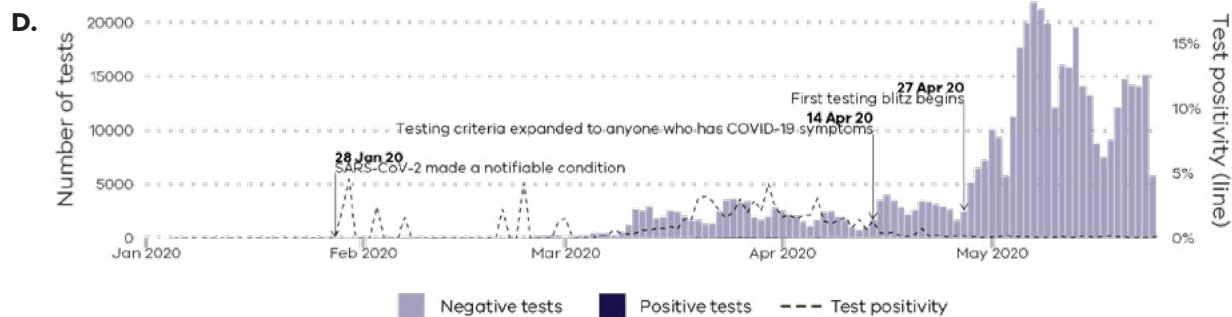
Eight countries recorded more than 10,000 deaths from COVID-19 during this period.

Mode of transmission

Evidence indicated that the virus that causes COVID-19 was primarily transmitted via respiratory droplets transmitted during close contact (WHO, 2020b). Research also showed that transmission could occur from asymptomatic individuals (before the onset of symptoms). This highlighted the importance of physical distancing for controlling transmission because of the difficulty in identifying individuals for testing (Yu and Yang, 2020).

Figure 3: First wave COVID-19 metrics in Victoria, 1 January - 25 May 2020: cases, hospitalisations, deaths and tests





- A.** Epidemic curve of daily new cases by onset date (or diagnosis date if asymptomatic) and key events in the pandemic – the first case had symptom onset on 19 January 2020.
- B.** Hospitalisation status of cases in hospital with COVID-19 (ward, ICU or ventilated) by onset date.
- C.** COVID-19 deaths by onset of disease.
- D.** PCR tests by date of test with daily test positivity rate.

A personal story

Heather contracted COVID-19 while working as a senior nurse in an infectious disease ward at a hospital in Greater Melbourne in 2020.

We heard about COVID first in late 2019 – knew that there was a new condition developing in China. At first, we thought it wasn't spread from human to human – but one week later, we learnt that it was and this was just before the first case in Melbourne was documented in late January 2020.

I was looking after the hospital's first COVID-19 patient in early February when the patient inadvertently coughed over me. Luckily, I did not contract the condition through this exposure.

The first wave of the pandemic in the first half of 2020 wasn't much to talk about from a hospital service nursing perspective. Our borders were closed and we did not have an extensive number of cases. I can't recall any of my patients dying in the first wave. And because I'm an infectious disease nurse, I had a natural curiosity about COVID-19 and was keen to care for these patients.

However, during the second wave in June 2020, the situation changed dramatically. This was the time when many outbreaks occurred in aged care facilities – and because so many of the residents were frail, many were hospitalised when they caught COVID-19 and many did die.

I remember looking after many of the patients from a number of aged care facilities and breaking down at the trauma that occurred there. It was an incredibly difficult time, and this was before the introduction of the COVID-19 vaccines, so the impact of the condition was much worse.

My despair around this time was made worse by the fact that our intensive care unit (ICU) rapidly filled with very unwell patients. When someone is on the ward and they develop life-threatening symptoms, a MET call is issued: this means, a medical emergency team attends to the patient to determine the best clinical response. This often means the patient needs to be transferred to ICU, but as this was full, really hard decisions had to be made about who would be transferred. No one wants to have to make these decisions – these patients are someone's parent, grandparent, spouse, sibling...

It was around this time that I contracted COVID-19. I was exhausted, but just assumed this was from all of the overtime I had been doing. I developed a sore throat so went for staff testing. I was talking to a nurse colleague and she picked up that I was also wheezing – a sign of a serious respiratory infection. But even with these signs, I didn't think that I'd have COVID-19 – I was definitely a bit naïve! After testing, I went home and isolated in my room.

And then, about 24 hours after I'd been tested, the pathology laboratory associated with the hospital called me. As soon as she told me I was COVID-positive, my mind went into a blur and I didn't really take in much of the information he gave me. Because I lived in a sharehouse, I needed to go into a quarantine hotel to isolate safely.

Overall, the hotel experience wasn't too bad – I was glad to not have to worry about spreading it to others. But I was worried about my mental health being alone in a hotel room for 2 weeks. In the end, I pretty well slept for the full 2 weeks of isolation.

Unfortunately, I was still unwell after these 2 weeks of isolation. I returned to work but only lasted about 30 minutes when my colleagues said I looked really unwell and was as white as a sheet. My heartbeat was racing and I was later diagnosed with pericarditis – so returned home for a further 3 weeks of rest with a heart monitor.

So, ultimately, it was 5 weeks after testing positive that I returned to work – but it was brutal as I still wasn't well. I had chronic fatigue until the end of the year. If I wasn't at work, I was sleeping. And in fact, even now, I don't think I have really regained my energy that I had before getting COVID.

So, ultimately, it was 5 weeks after testing positive that I returned to work – but it was brutal as I still wasn't well. I had chronic fatigue until the end of the year. If I wasn't at work, I was sleeping. And in fact, even now, I don't think I have really regained my energy that I had before getting COVID.

I've been really careful with my health, making sure my diet is optimal and trying to exercise regularly. As painful and as hard as it was to come back to work, it was probably the right thing to do mentally and physically.

But I do wish work had been able to provide more supports to staff like me who were really hit hard by COVID. Some people who weren't able to do the physical side of ward work were given desk roles, but this also presented difficulties.

From a mental health point of view, the challenges have been great. In 2020 almost everyone praised healthcare workers as 'COVID heroes'. But then, in 2021 when the COVID-19 vaccines were rolling out, we started getting verbally abused from some patients and families who didn't trust the vaccines and didn't trust nurses or doctors. I was actually cornered at one point and called a murderer. I tried to compartmentalise this abuse, but I'm human. These aggressive experiences pushed me over the edge – I saw my GP and started taking anti-anxiety medication.

In school we learnt about civil wars and the fact that sometimes families would turn against each other. I never thought I would witness this happen in modern society – but it did happen during the pandemic – and many healthcare workers suffered extreme stress as a result.

Another concern for me was the fact that my parents and extended family were all overseas and if they'd been unwell, I wouldn't have been able to go or come back easily. Luckily, I did not need to make any emergency trips to see them, but this was an issue for everyone with family overseas.

Going through the pandemic, with so much upheaval, does make you think about life goals and dreams. For some of my colleagues, this has led them to leave health care or take up new health roles elsewhere. For me, I'm still loving my work and was able to buy my first home after all of the overtime – so every cloud has a silver lining! Being so unwell with COVID for months has also made me really focus on looking after my health.

Note: 'Heather' is a pseudonym.

COVID-19 public health response

In responding to a widespread infectious disease, a number of control measures are available:

- testing
- case identification
- contact tracing
- isolation of cases and quarantine of contacts
- outbreak management.

These control measures were supported by the public health directions issued by the Chief Health Officer under the emergency powers of the *Public Health and Wellbeing Act 2008*. The directions imposed stringent measures to combat the spread of COVID-19 and were made with careful and proper consideration of relevant human rights under the *Charter of Human Rights and Responsibilities Act 2006* and to ensure they were proportionate to the public health risk (Department of Health, 2021).

Movement and activity restrictions varied in stringency at different periods during 2020 and 2021 but were never lifted entirely, with broad-ranging restrictions and obligations, particularly regarding the safe operation of venues and businesses, remaining in place as incidence declined (Department of Health, 2021).

Stay-at-home orders

These directions required people to remain at home with 4 exceptions:

- attending work (if unable to work from home) or school
- seeking care or caregiving
- daily exercise
- buying food or other essentials.

A 5th reason to leave home was included in 2021 - to get vaccinated.

During the second wave, a curfew was added to the stay-at-home orders to limit mobility and interactions between people to further reduce the risk of transmission. At given times, mobility was further restricted to a 5 kilometre radius from home.

Quarantine, isolation and testing directions

These directions placed isolation requirements on people who had contracted COVID-19 and quarantine requirements on people who were identified as contacts of a COVID-19 case. During 2020 the period of isolation and quarantine was 14 days. As vaccination was rolled out during 2021, these periods were reduced for people who were fully vaccinated for COVID-19.

The testing directions required people identified as a contact of a COVID-19 case to be tested for COVID-19 through a PCR test and quarantine.

Physical distancing

Physical distancing between people aimed to minimise interactions to limit the opportunities for disease to spread from an infected person to a susceptible person. Measures to bring about physical distancing among populations had been used in previous efforts to control influenza epidemics and other pandemics.

Face covering requirements

These initially required people aged 12 years or older to cover their mouth and nose when they left their home. The age when mouth and nose coverings were required was reduced at different stages of the pandemic.

Gathering restrictions

These restrictions limited the number of people who could attend a venue. Religious ceremonies, weddings and funerals could be conducted with limited numbers. Household visitor limits were also in place, except for permitted reasons and with an exemption for intimate partners.

Hospital, aged care and disability service visitor restrictions

To limit the risk of transmission to older Victorians, people with disability, people with existing health conditions or people who were at increased risk of serious health impacts from COVID-19, visitor restrictions were put in place in hospitals, aged care facilities and disability services.

Early childhood (childcare and kindergarten), schools and adult education settings (including universities, TAFEs and training organisations)

Childcare, kindergarten and face-to-face learning for schools and adult education settings were restricted at times during 2020 and 2021. These changes were intended to mitigate transmission risk arising from inherent features of onsite learning in these settings such as challenges around practising physical distancing and sharing of communal spaces and facilities.

Community sport and recreation

Indoor sport and recreation facilities, including playgrounds, gymnasiums and swimming pools, were closed for much of 2020 and 2021.

Shopping, retail and personal services

Restaurants and cafes were limited to takeaway service only for extended periods. Pubs, clubs, bars and nightclubs were closed for extended periods. Real estate auctions operated remotely, with inspections limited to private appointments. Other retail services were open subject to density limits and distancing requirements.

Entertainment

Galleries, museums, national institutions and historic sites, animal facilities (such as zoos and wildlife centres) were closed to the public for much of 2020 and 2021, as were outdoor amusement parks and arcades, indoor cinemas, drive-in cinemas, concert venues, theatres, auditoriums; arenas and stadiums; and casinos, retail betting premises and gaming venues.

Travel

At times, travel within Victoria was only allowed for work or care purposes.

Holiday accommodation and camping sites were closed, except for residents, emergency accommodation or work purposes, for much of 2020 and 2021.

During this period, other states and territories at times introduced travel restrictions on Victorians entering their state for work or recreational purposes. Victoria also introduced travel restrictions at times on people from other states travelling to Victoria.

QR codes

Quick-response (QR) code data was a source of intelligence for Victoria's contact tracers. From June 2021 all businesses had to use the Service Victoria QR code check-in application. Most employees were also expected to check in this way when working on site. QR codes were also progressively rolled out across the public transport network.

COVID-19 vaccination mandates

These mandates were introduced for a broad range of workers in 2022 to reduce the risk of severe disease in vulnerable groups and the risk of transmission in high-risk settings.



The COVID-19 vaccination mandates are discussed in the 'Interwave phase – Victoria's COVID-19 vaccination program' section.

These significant public health and social measures were introduced to limit the transmission of COVID-19 between people, safeguard the health system from significant demand and to reduce the health impacts on all Victorians.

However, these measures also had significant social, mental health and economic impacts (National Mental Health Commission, 2020). The loss of social interaction and the added stressors of moving to remote work or schooling and impacts of sudden restrictions to prevent further outbreaks affected the mental health of many people (AIHW, 2020a).

The 2024 Commonwealth Government COVID-19 Response Inquiry noted that after an initial strengthening of trust in government, restrictions on personal freedoms were less accepted across Australia (Commonwealth of Australia, 2024). The inquiry also heard that different approaches taken across states and territories, while often driven by different local conditions and population risk profiles, may have contributed to community distrust.

The economic impacts caused by loss of business activity resulted in job losses across many sectors. Loss of employment increases emotional and financial stress. Individual support packages, such as the Commonwealth's JobKeeper payments, and business support packages, such as the Victorian Government's Business Support Fund, were introduced to reduce the economic impacts of the pandemic. However, social and financial impacts will have remained for many Victorians.



The mental health impacts of the COVID-19 pandemic are discussed more in the 'Second wave – Impact of the pandemic on family violence' section, the 'Third wave – Mental health impacts' section and the 'Third wave – Mental health impacts on residential aged care residents' section.

A personal story

Nicole was a professional female working in a health non-government organisation, married with 2 sons who were in primary school in 2020.

Immediately before the pandemic, I was working 4 days/week – 3 days in an office, one at home. My husband was working full-time in an office.

After the public health directions around working from home commenced, it was relatively easy for my husband and me to convert to working from home – both of us were able to maintain our usual work hours and our jobs were not really impacted at that early stage.

This all changed when learning from home was announced for school children. We had got into the habit of watching the Premier's daily COVID-19 press conferences, and when learning from home was announced, I actually burst into tears because I knew what that would mean for everything – for us as parents trying to juggle work and home learning and then for the kids themselves – especially for their social development and mental health. While I was worried about the juggle, the social impact on the kids was my main concern.

I had also started a new job in August 2019, after leaving an organisation where I had been for 17 years. So I had only been in this new role for a little over 6 months when learning from home started. This new job was wonderful, but it had its challenges, as any new job does. This all seemed too much when learning from home was announced – if I'd have known how long it would drag on, things would have been even worse! But we adapted pretty easily in the early stages.

Learning from home was difficult for primary school children. Our boys could be left for around 20 minutes at a time where they would be engaged in an activity, but then after 20 minutes, they'd need support. In talking with friends who had secondary-school aged children, they were older and more responsible and seemed to handle learning from home better.

Because our boys had strong foundational skills – their reading and writing were strong – we weren't too worried about them from an academic perspective. But emotionally, we were aware that learning from home was hard, especially on our older boy – friendships are really important at his age. There was lots of laying in bed at times, a bit flat, with not a lot of joy in his life.

So, we really tried to focus on doing things to stimulate some fun and find the joy. We'd arrange to meet friends in the park or have online meetings with friends and family that were completely separate from school learning.

So, we really tried to focus on doing things to stimulate some fun and find the joy. We'd arrange to meet friends in the park or have online meetings with friends and family that were completely separate from school learning. We even had an online birthday party for our younger boy, with 8 little boys singing happy birthday.

When I was reminded of that online party recently, I had a strong, visceral reaction – and was surprised at the strength of my own reaction some years after the event.

And it wasn't a good response! I'd been aware that going into Google classroom still triggers a strong emotional response for me, but I've now seen even the fun things from that time can be a bit triggering because they were so out of the ordinary.

So many things from that time became symbols of the pandemic that I was trying to forget. When other people talk about this period as family bonding time, I struggle to relate to that.

One of the key challenges I found with learning from home was the difference in expectations from my employer to that of my husband's. His employer just expected him to be available throughout the workday, even though they were aware we had young boys at home. I became angry at the lack of understanding from his managers and this frustrated me no end – I even started wondering if I would have to quit my job. There was just no recognition that he might have to do stuff with children – and I've heard this from many friends who felt there were gendered expectations from some employers around learning from home roles of parents.

To help address this, I would focus on my work from 5 am to 9 am, and my husband would spend time with the boys between 7.30 and 9 am. Then I would juggle things back and forth with the kids and my own work to mid-afternoon. And then I would do more work in the evening. It was a gruelling schedule, but we somehow made it work! This lack of boundaries has persisted and has at times made it difficult to get the work-life balance right. And I know we were lucky in many ways – I know it was even harder for single parents or for families with many children. And working remotely has also had benefits and the overall shift in the workplace has been positive – as long as the kids are at school!

After onsite learning resumed, the school mask mandates came in. We tried to send the boys off to school with their masks – but we knew this would be difficult. Some kids did keep them on all day, but many younger ones struggled. We told the boys to follow whatever the teacher directed – knowing that there would be times when the kids would battle with the masks.

Vaccine mandates did create some difficult conversations. As a family, we were all very happy to get the vaccines – and my extended family was very pro-vaccination. But we did have some friends who were less enthusiastic and had some issues with accepting the mandates. Our challenges with the vaccines were more about neither of our boys being very familiar with vaccines/injections at their ages. There were lots of treats to get through the first doses – and unfortunately that first dose was really painful for our younger one. The poor kid was physically hiding when it came time for the second one – I should have had both my husband and I manage that dose.

We have talked about the significance of the pandemic with both boys. We wanted them to know that what we went through was something we'd never experienced before – it wasn't normal. We wanted them to know that thinking about masks and whether or not we should meet with particular friends wasn't normal. We wanted to encourage them that life is more fun than the hardships of the pandemic. They were probably too young to take this in, so we just tried to focus on sticking this through until life got back to normal.

Before the pandemic, I always felt we were isolated in Australia – we have been the lucky country for so long. But living through the pandemic and the huge upheaval that came with that, changed my confidence. It was a reality check – we're not impervious to challenges.

Contact tracing

Contact tracing is a key activity to stop the transmission of COVID-19. Contact tracing involves identifying people who may have been in contact with someone with COVID-19 and putting measures in place to support them to minimise the risk of them getting ill and also spreading the infection to others.

Community transmission of COVID-19 in Victoria was largely managed through testing, tracing and isolating cases and their close contacts as quickly as possible.

Table 3 summarises the total number of contacts who were managed by the department and Local Public Health Units in 2020 and 2021.

Table 3: Number of contacts managed by the department and Local Public Health Units in 2020 and 2021

Year	Number of contacts managed by Department of Health	Number of contacts managed by Local Public Health Units	Total number of contacts managed by the department and Local Public Health Units
2020	102,488	N/A	102,488
2021	1,008,929	196,704	1,205,633
Total	1,111,417	196,704	1,308,121

Outbreak management

Typically, an outbreak was considered to occur when there was one or more cases of COVID-19. The types of settings where outbreaks could occur included:

- residential aged care facilities
- health services
- schools and education settings
- workplaces, including factories and distribution centres.

Outbreaks could lead to significant, rapid disease transmission. The department worked closely with relevant experts, stakeholder and sector representatives to develop specialised outbreak management approaches for each of these settings.

An **exposure site** was any location where an infected person was for a significant period during their infectious period. If another case came from that exposure site, the location would be upgraded to an **outbreak**.

Table 4 summarises the number of outbreaks and exposure sites managed by the department and Local Public Health Units in 2020 and 2021.

Table 4: Number of outbreaks and exposure sites managed by the Department of Health and Local Public Health Units in 2020 and 2021

Year	Site type	Number of sites managed by Department of Health	Number of sites managed by Local Public Health Units
2020	Outbreak	781	N/A
2020	Exposure	889	N/A
2021	Outbreak	1,662	3,033
2021	Exposure	11,967	4,164

Testing

Initially, testing for COVID-19 was tightly targeted to returning travellers and people with symptoms. This targeted approach was progressively relaxed as pathology supplies improved and broad surveillance was prioritised.

All laboratories had to implement new testing capacity to manage COVID-19 testing, including buying new scientific instruments, new consumables (in limited global supply) and recruiting and training new staff (Department of Health, 2021).

On 27 April 2020 the Victorian Government announced a statewide testing blitz to better understand how coronavirus was spreading in the community. The testing blitz introduced widespread and convenient symptomatic and asymptomatic testing at drive-through, walk-up and mobile testing locations. Community engagement teams supported these locations, providing the latest public health advice (Department of Health and Human Services, 2020a).

As at 14 June 2020 more than 590,000 Victorians had come forward for testing, giving Victoria one of the highest testing rates in the world. However, the department began targeted testing in communities with low testing rates, high case numbers, high-risk workforces and vulnerable groups, providing a fuller picture when it came to tracking the virus across the community and state (Department of Health and Human Services, 2020a).

Wastewater surveillance

In early 2020, as the world looked for new tools to identify and respond to the emerging pandemic, monitoring of population-level samples through wastewater was identified as having potential value, building on its longstanding use in polio eradication (Department of Health and Aged Care, 2023; WHO, 2023). COVID-19 viral fragments shed into wastewater from washing and toileting could be identified using highly sensitive molecular methods in samples collected from any level of the sewage system, from large wastewater treatment plants to manholes (Water Research Australia, 2024).

Victoria's wastewater surveillance program was rapidly developed and then integrated as part of the state COVID-19 emergency response to provide early warning of community transmission and enable rapid containment.

The department was an early adopter, investing in developing the program as well as the national collaboration on sewage surveillance for COVID-19 lead by Water Research Australia (Black et al., 2021). This collaborative group brought interdisciplinary researchers and practitioners from across Australia and New Zealand together and fast-tracked rapid sampling and analysis and validation processes over a 3-month period and ongoing continuous improvement and innovation throughout the pandemic (Gazeley et al., 2024; Hewitt et al., 2022; Schang et al., 2021; Water Research Australia, 2021a; 2021b).

After this work and from August 2020, the Victorian wastewater surveillance program was resourced, sustained and integrated within the COVID-19 response. The program focused on early detection to prevent, minimise and assist the containment of outbreaks, informing the public of the locations of heightened risk and targeting of pop-up and other testing services. The program also provided reassurance of the absence of transmission. This was especially important in regional areas during the second wave to ensure less stringent public health and social measures could be safely applied. Both positive and negative results helped inform timely public health decisions and the COVID-19 response.

The program's success relied on novel interdisciplinary partnerships created between Victorian water utilities, public health laboratories, public health agencies and frontline responders. The program's success also demonstrated the importance of wastewater surveillance during public health emergency events.

Hotel quarantine

Hotel quarantine for returned travellers

In February and March 2020 government effort was directed towards slowing the spread of COVID-19 in Victoria through rapidly identifying, isolating and quarantining risk groups. Returned travellers were considered the most likely source of imported transmission, and initial measures included directions to 'self-isolate' for 14 days on their arrival into Victoria (COVID-19 Hotel Quarantine Inquiry, 2020a). At this time, all actions focused on reducing community transmission and mitigating the risks of an uncontrolled rise in case numbers and the severe impacts this might have on mortality, morbidity and the capacity of health services.

The hotel quarantine program emerged quickly, within 36 hours of the 27 March 2020 National Cabinet decision determining that all travellers arriving in Australia would have to undertake mandatory 14-day isolation at designated facilities (COVID-19 Hotel Quarantine Inquiry, 2020a).

The department, in conjunction with the Department of Jobs, Precincts and Regions, and with support from the State Control Centre, rapidly developed a new service model for hotel quarantine. This model included supports, clinical pathways and critical incident monitoring to help make the program as safe as possible, and to support the health and wellbeing of the people quarantined.

This hotel quarantine program ran for 3 months from 29 March to 30 June 2020. In this time, 21,821 returned travellers took part in the program (COVID-19 Hotel Quarantine Inquiry, 2020b).

Like quarantine programs around the globe, Victoria saw occasions of transmission from guests to staff who worked in the program and subsequent leakage of infection from the program into the broader community. Notable outbreaks occurred at the Stamford Rydges and Rydges Carlton hotels during times of low community transmission in the state.



This original hotel quarantine program ended on 30 June 2020, and Victoria stopped accepting international arrivals. The Department of Justice and Community Safety set up a new quarantine program, discussed more below.

Hotels for Heroes

An adjunct 'Hotels for Heroes' hotel quarantine program provided free accommodation in hotels or apartments for frontline workers who were exposed to COVID-19 or had a positive diagnosis and could not safely self-isolate at home. The program recognised that healthcare and other frontline workers were at greater risk of coming into close contact with someone with the virus and consequently were more likely to contract and be diagnosed with COVID-19 than any other workforce.

Department of Justice and Community Safety COVID-19 Accommodation Program

On 27 July 2020 the Department of Justice and Community Safety assumed operational responsibility for the COVID-19 Accommodation Program. The program was responsible for all quarantine arrangements in Victoria and helped introduce the mandatory 14-day quarantine for international arrivals (Department of Health, 2021).

On 1 December 2020 a new administrative office, COVID-19 Quarantine Victoria (CQV) was established, with overall responsibility for the COVID-19 Accommodation Program. From 1 December 2020 to 31 December 2021, 69,218 people were accommodated in the CQV hotel quarantine program.

A personal story

TL was an authorised officer at Melbourne Airport in 2020.

An authorised officer is an employee appointed through an Instrument of Appointment and Authorisation to carry out statutory compliance or enforcement functions under legislation. Authorised officers at Melbourne Airport and CQV quarantine hotels undertook activities related to housing returned travellers and others under the Public Health and Wellbeing Act 2008. This is TL's story.

From the beginning, we all had to learn to navigate through the multiple processes in place to escort incoming passengers from the aircraft through the terminal and then onto buses for transport to quarantine hotels. These processes, which at times could change daily given the evolving nature of COVID, were established, documented and approved by those foundation members of CQV airport operations who we need to acknowledge and congratulate for paving the way for all CQV teams at Melbourne Airport. We dealt, and to a degree continue to deal with, all major airport stakeholders (7–8 different departments) for every flight we attended, and we all worked in relative harmony knowing that our efforts were to protect Victoria from this pandemic – something that had never been done before and let's pray will never happen again.

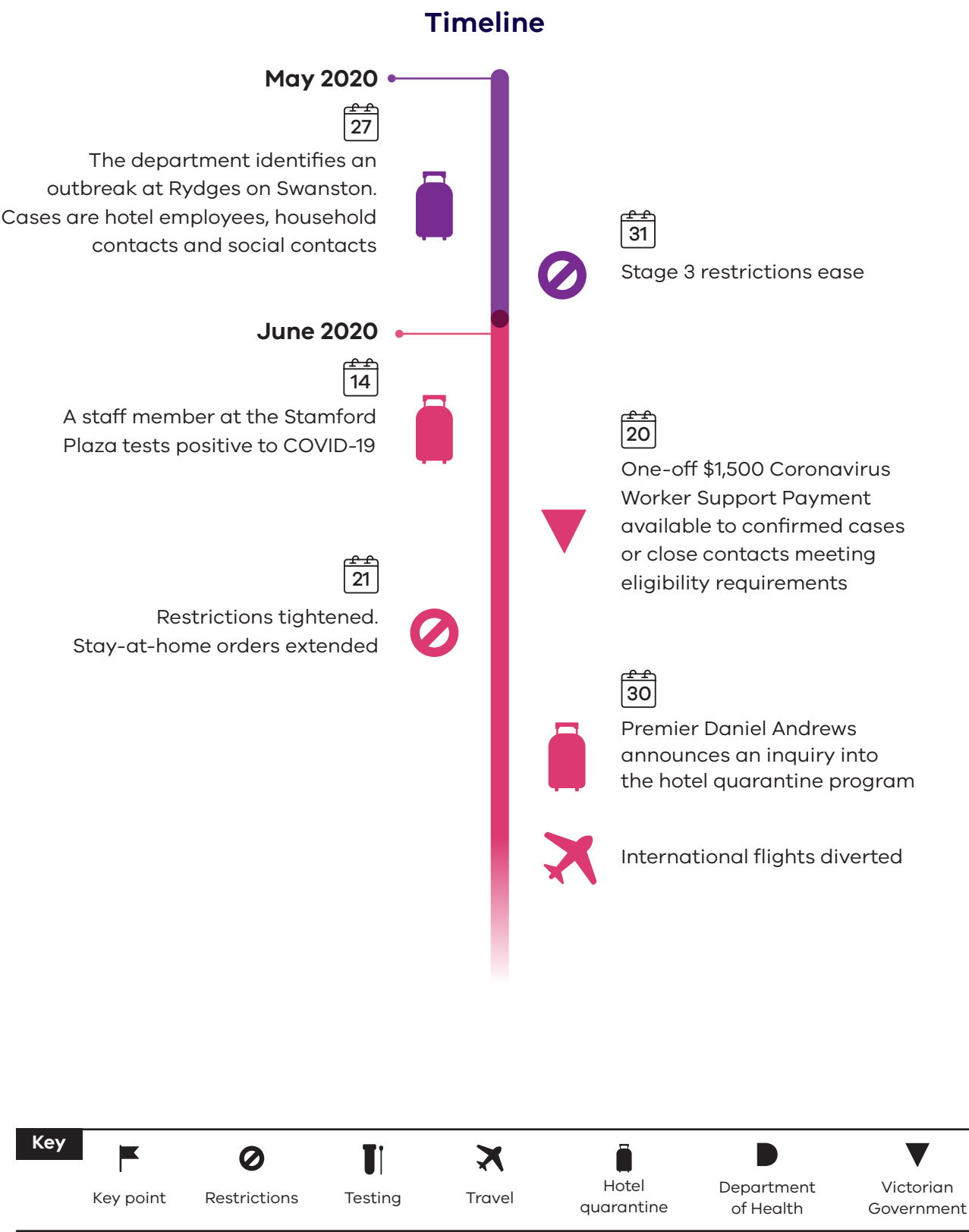
We treated all passengers as individuals as we greeted them back to Victoria. Some passengers were very emotional, particularly in the early days where some had not been home for a long time. Then there were passengers that opposed quarantine and were not afraid to call it out and remonstrate.

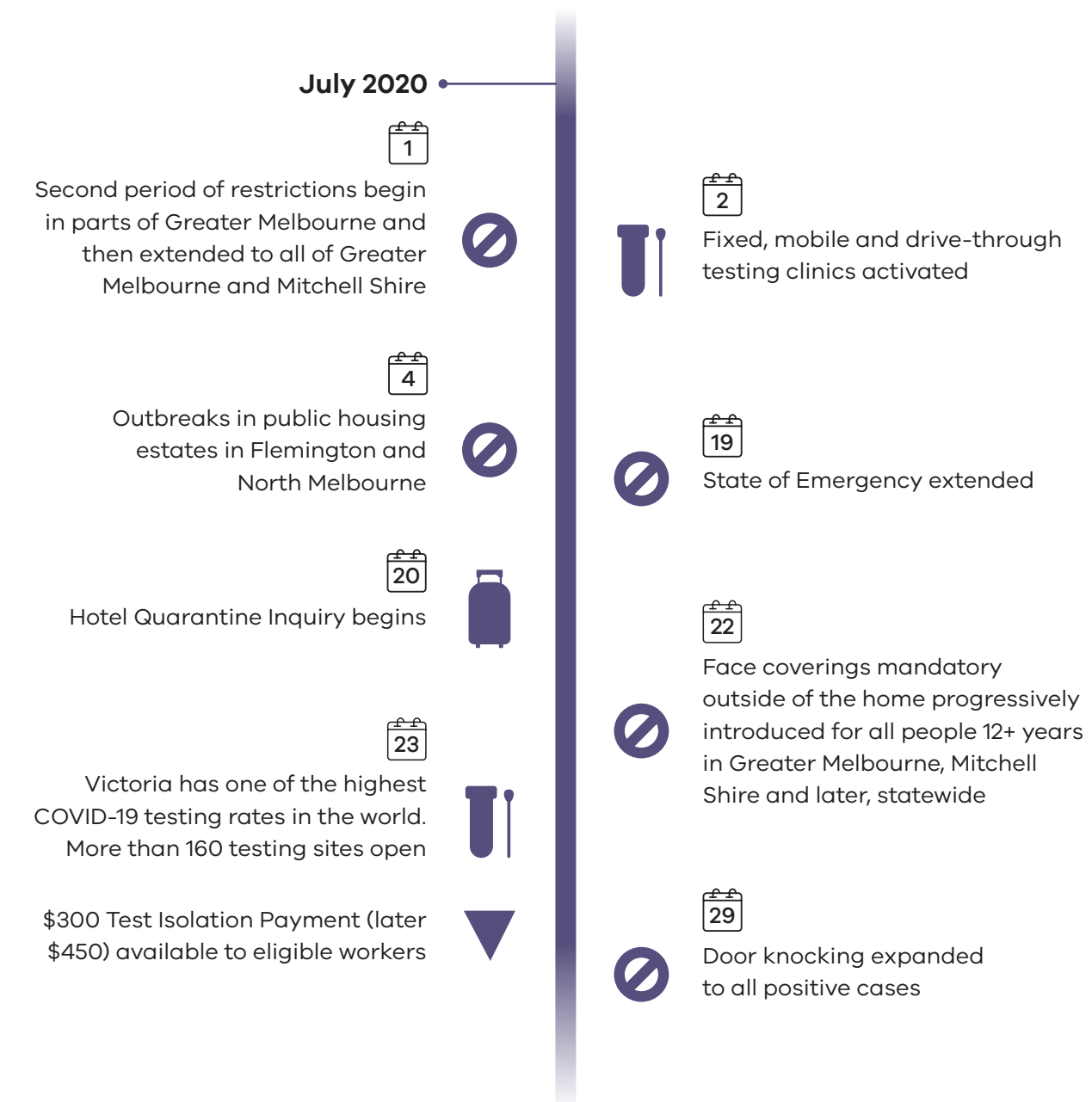
We treated all passengers as individuals as we greeted them back to Victoria. Some passengers were very emotional, particularly in the early days where some had not been home for a long time.








We were always supported by strong leadership and policy directives by the Victorian Government along with CQV operating procedures providing team members with the necessary policy and legal framework to handle such situations. Also, onsite presence and support of law enforcement agencies such as Border Force and the AFP assisted with problem passengers.

We were also heavily involved with Afghan repatriation flights, which was not only emotional for the passengers but also for many of us who could see in their eyes the panic and relief of landing in a country that had welcomed them with open arms and they and their children were now free and safe from harm. These flights highlighted the compassionate nature of Australia, which we should all embrace and be very proud of. I could understand some of the issues the refugees were grappling with as my wife was a refugee, and when I spoke to her about these special flights, she completely understood the passengers' emotions and vulnerabilities.

Second wave





Key							
	Key point	Restrictions	Testing	Travel	Hotel quarantine	Department of Health	Victorian Government

August 2020



Victoria declares a State of Disaster.
Stage 4 restrictions imposed in metropolitan Melbourne. Curfew imposed and mobility restricted to a 5 kilometre radius from home.



Daily new cases diagnosed peak at 725



More than 2 million PCR tests processed. More than 190 testing sites open. Daily testing numbers reach 34,000 on some days



September 2020



Suburban Response Units set up to provide local insights and work with local communities to help contain localised outbreaks



Restrictions eased progressively over following months



200 testing sites open



Surveillance testing for workers in the meat, poultry, seafood processing and supermarket and refrigerated distribution sectors



Rapid Response Teams undertake onsite testing at rural and remote businesses



Key



Key point



Restrictions



Testing



Travel



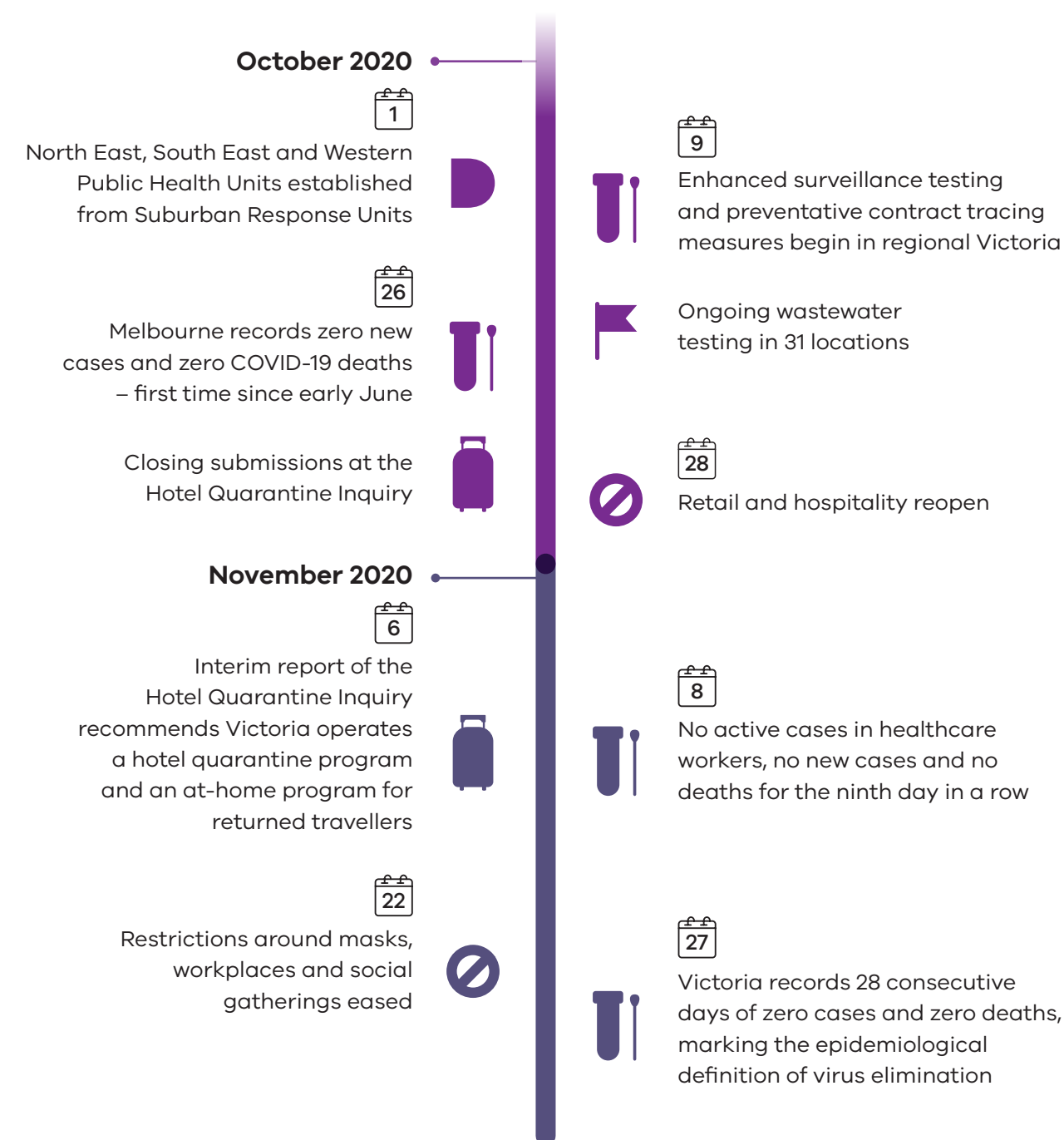
Hotel quarantine









Department of Health



Victorian Government



Key							
	Key point	Restrictions	Testing	Travel	Hotel quarantine	Department of Health	Victorian Government

Second wave: 26 May to 27 November 2020

Data and key points

The second wave is defined as the period of community transmission from 26 May 2020, when the first staff case in hotel quarantine tested positive, to 27 November 2020, when Victoria recorded 28 days of no new community cases.

In total over this period, there were 18,698 notified cases of COVID-19 in Victoria (Figure 4).

Epidemiological summary

This wave was Victoria's main epidemic wave in 2020.

Following a period of low case numbers nearing local elimination, Victoria began to again see rising case numbers. Genomic analysis suggested transmission from a hotel quarantine guest to a staff member was associated with an outbreak that included transmission into the wider community. This and another hotel quarantine outbreak were the subject of the Victorian Board of Inquiry into the COVID-19 Hotel Quarantine Program. All international arrivals to Victoria were paused on 7 July 2020.

The start of this wave coincided with the further easing of previous restrictions including increased caps for indoor and outdoor gatherings, reopening of personal services and restaurants and the staged return of students to onsite school. With this, there were clusters of infections associated with gatherings. In response, household gatherings were limited once again to 5 visitors from 22 June 2020. Although many outbreaks were contained early in this epidemic, a notable outbreak at a large Melbourne school involved highly interrelated communities and proved difficult to contain.

Progressively more extensive control measures were reimplemented. Stay-at-home orders were initially locally targeted to specific social housing residential blocks, followed by selected postcodes but were insufficient to reverse the epidemic trajectory. On 8 July 2020 stay-at-home orders were reimplemented across metropolitan Melbourne. A 'State of Disaster' was declared on 2 August 2020 with added restrictions including an 8pm curfew, a one-hour limit per person for daily outdoor exercise, one household member per day to shop for groceries, closure of childcare centres and a 5km travel radius from home. Face masks were made mandatory whenever residents aged 12+ years were outside the home from 23 July 2020.

Case numbers peaked in late July, and thereafter the outbreak trajectory reversed. Restrictions were progressively eased in a series of steps in September and October 2020. On 27 November 2020, local elimination was successful following 28 days of no new community cases.

Demographics

- The median age of COVID-19 cases in Victoria was 34 years – younger than the first wave.
- 47.3% of cases were male.
- Infected people tended to live in areas of greater socioeconomic disadvantage, with 33% of cases residing in most disadvantaged areas and 10.6% of cases in the least disadvantaged areas.
- 94% of cases lived in metropolitan Melbourne.
- 18% of cases (3,388 people) were healthcare workers.

Epidemiological characteristics

- Nearly all infections were locally acquired, with only 0.6% of reported infections acquired overseas.
- 72% of cases reported symptoms at testing. This is much lower than the first wave and reflects broader eligibility and take-up of testing across the community.

Outcomes

- 2,305 cases were hospitalised (12.3% of all cases). The median age of hospitalised cases was 73 years.
- 260 cases were admitted to an intensive care unit, and 130 were ventilated.
- 815 COVID-19 deaths were reported (4.4% case fatality rate). The median age of cases who died was 87 years.

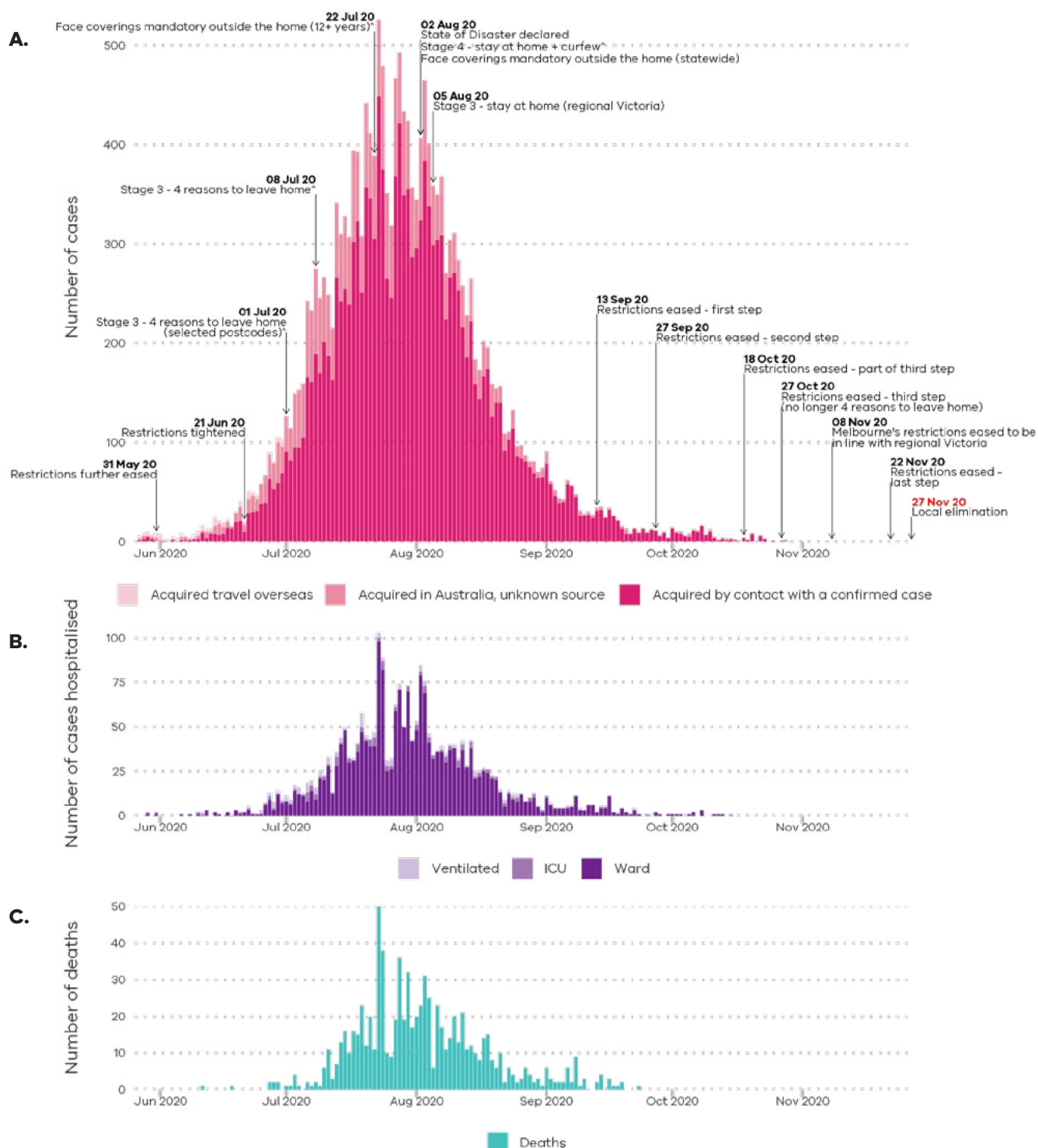
Testing

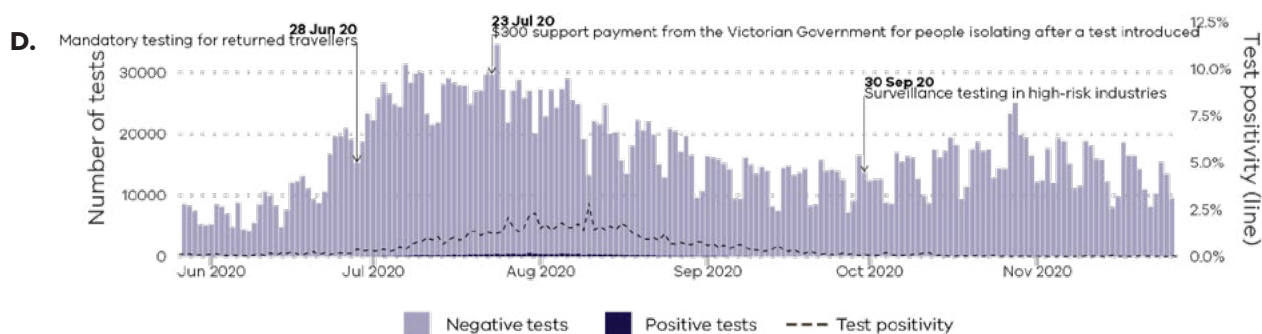
- More than 3 million PCR tests were processed in this wave (3,086,063 tests).

Aged care settings

- 10.5% of cases (1,961 people) were aged care residents.
- 46% of aged care resident cases (899 people) were hospitalised.
- 33.5% of aged care resident cases died (657 people). 80% of total deaths in this wave were aged care residents.
- 2,040 cases were staff in residential aged care settings (10.9% of total cases).
- To help prevent incursions of COVID-19 in aged care facilities in Australia, visitor restrictions were implemented and aged care workers were encouraged to work at a single site.

Figure 4: Second wave COVID-19 metrics in Victoria, 26 May to 27 November 2020: cases, hospitalisations, deaths and tests



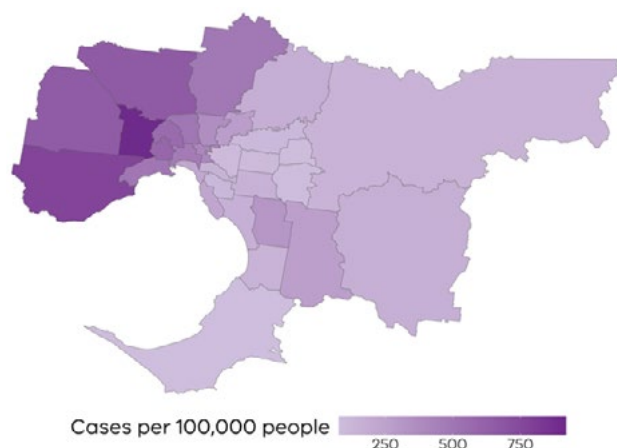


- A.** Epidemic curve of daily new cases by onset date (or diagnosis date if asymptomatic) and key events in the pandemic.
- B.** Hospitalisation status of cases in hospital with COVID-19 (ward, ICU or ventilated) by onset date.
- C.** COVID-19 deaths by onset of disease.
- D.** PCR tests by date of test with daily test positivity rate.

Early outbreaks during the second wave were initially contained to a small group of suburbs, with 10 suburbs placed under restrictions on 29 June 2020. Soon after this, on 9 July 2020, 9 social housing towers in North Melbourne and Flemington (about 3,000 residents) became subject to similar restrictions (Department of Health and Human Services, 2020b; 2020c). The targeted containment measures in specific suburbs did not prevent broader community transmission. Cases occurred in other areas of Greater Melbourne and, to a lesser degree, regional areas of the state.

Higher rates of COVID-19 were seen in areas of higher disadvantage and lower socioeconomic status. For example, COVID-19 incidence was higher in postcodes with larger proportions of people who were unemployed, had no access to paid leave, or spoke a language other than English at home, as well as in areas with lower median ages or larger mean household sizes (Roder et al., 2022). This meant greater incidence was seen in workers who could not work from home, in families who lived in conditions that made isolation difficult, and in workers who were employed casually or in insecure employment with limited (or no) sick pay provisions. Many lower income workers were employed in multiple sites, and this mobility drove transmission in many workplaces. This meant that much of the transmission of the second wave occurred in lower income areas, particularly in the west and north of Greater Melbourne, as shown in Figure 5.

Figure 5: Cases of COVID-19 per 100,000 people, Greater Melbourne, 26 May to 27 November 2020



Adding to the risk of transmission was the fact that the second wave began in late May 2020 as Victoria headed into the winter months. This was when people were more likely to be indoors with reduced ventilation – a risk factor for COVID-19 transmission that was only gaining an understanding at this time (WHO, 2020b). This occurred in the context of there being no effective pharmaceutical strategies available because COVID-19 vaccines and antiviral medications were yet to be introduced. These factors all combined to drive significantly increased COVID-19 transmission in this wave.

Sustained community transmission

The second wave also affected particular industries more than others, often in workplaces where physical distancing was difficult. Large case numbers were seen in meat processing and construction sites, and in warehousing and distribution. Frontline hospital, health service, aged care and disability services were stretched dealing with high case numbers as well as some staff contracting the illness and needing to isolate for 2 weeks. Also, some staff were identified as contacts and had to quarantine, further impacting on the staffing capacity of these services.



The significant outbreaks in aged care are discussed more in the 'Third wave – Residential aged care' section.

In home settings, much of the second wave transmission occurred in families that lived in conditions that made isolation difficult, including multi-generational living as well as higher density living. This sustained transmission was greater in lower income areas of Greater Melbourne and was also seen in many overseas countries, including in Europe and in North and South America (PHE Transmission group, 2020; Quantin and Tubert-Bitter, 2022; Silva and Ribeiro-Alves, 2021; Tai et al. 2020).

These factors combined to result in sustained community transmission of COVID-19 in Victoria from late May 2020. To bring this under control, more stringent public health and social measures were introduced. These included face-covering requirements, curfews, limits on the distance people could travel and further restrictions on businesses across the state.

To strengthen engagement activities, the department also strove to improve communication resources used to inform Victorians about COVID-19 and public health and social measures, especially those resources for culturally and linguistically diverse communities and for community members who had special needs.

It was during the second wave that resourcing was significantly increased to recruit a COVID-19 surge workforce to support the stronger public health COVID-19 response required to bring the second wave under control. This led to a slow relaxing of the public health and social measures in late 2020 (Department of Health, 2021).



The impact the pandemic had on Aboriginal Victorians is discussed more below and in the 'Interwave phase - impact of COVID-19 on Aboriginal Victorians' section.

Key responses to the second wave

While public health and social measures were made more stringent to address the significant community COVID-19 transmission that occurred, the department and broader Victorian Government implemented a number of key measures to help support Victorians.

Key financial support measures in the second wave

As well as the financial support measures the Victorian and Commonwealth Governments introduced in the first wave, extra support measures were introduced by the Victorian Government in the second wave, including:

- the COVID-19 Worker Support Payment, which provided \$1,500 to workers who had to isolate or quarantine and did not have access to sick pay
- the COVID-19 Test Isolation Payment – a payment to support Victorian workers who were waiting for PCR test results and had to isolate in the meantime.

These financial supports aimed to make it easier for people to comply with public health directions, thereby reducing the chances of COVID-19 transmission and helping to keep people safe.

Tailored engagement with Aboriginal communities

The Victorian Government COVID-19 Aboriginal Community Taskforce was set up to develop and deliver emergency management responses to the pandemic in Aboriginal communities. The taskforce engaged with Aboriginal Community Controlled Health Organisations, guided by the *Victorian COVID-19 public health management plan for Aboriginal peoples and communities* (Premier of Victoria, 2020d). This ensured First Nations people in Victoria had good access to testing, treatment and supports to reduce the risks of COVID-19 in their communities.

A personal story

Michael Graham was the chief executive officer, Gavin Brown was the chief operating officer and Greta Duke was the operations lead – Victorian Aboriginal Health Service (VAHS).

Michael, Gavin and Greta are leaders of the VAHS, established in 1973 to address the specific health needs of Victorian Aboriginal communities. VAHS operates services in Fitzroy, Preston, South Morang and St Albans. This is their story.

When the pandemic hit, we threw away the book. We knew we were going to have to do things differently if we were going to protect our clients. We had to be agile.

Our clinical director had been keeping an eye on what was happening overseas with this new virus – they told us it was starting to get out of hand and that we were going to have to be prepared. And 3 or 4 days later, the Prime Minister, Scott Morrison, declared Australia was officially in a pandemic.

At VAHS, we immediately sent our most vulnerable staff – the older ones, the people with weaker immune systems – home immediately. We spoke to all of our outreach workers and told them that we were now going to do as much work as possible by phone.

These staff had to ring our clients twice a week, every week, and give them a very clear message: 'stay home!'. There were strong Aboriginal kinship and values operating here: no one wanted to harm elders, aunties or uncles – no one wanted to be responsible for bringing COVID-19 into their home.

And we only had 72 cases of COVID-19 in our community across Victoria during the first and second waves. When we had a case of COVID-19 in one of our clients, we would do the contact tracing – we were probably quicker than other contact tracers because we knew our community and who would be at risk.

We prepared a pandemic plan early using the skills of a number of our staff, and other non-Aboriginal organisations came to us to see what we had developed, and we helped those organisations prepare their pandemic plans.

We quickly organised our offices so most of our staff could work from home. We were lucky in this regard: we had already been looking at telehealth for about 18 months before the pandemic. We initially thought it might not work for us as our clients generally like to meet their doctors and health workers in person. But we realised that telehealth could help protect our clients from COVID-19, so we started encouraging our clients to have their appointments and keep connected with our workers by telehealth. When our staff had to provide face-to-face care – such as when our maternal and child health nurses would have to check on babies – we made sure they wore full PPE [personal protective equipment] to do this.

We were really strict about this – some staff said they looked like astronauts! – but we knew we had to protect our staff and our clients, many of whom have health conditions that meant they would have been really sick if they'd got COVID-19. All of our staff understood this and worked collaboratively to keep our workplace and our clients safe.

VAHS has been operating for decades and, importantly, over this time we've built a lot of trust with our community. So, when we started sending out messages about how to protect yourself from COVID-19, people trusted us and followed our advice. And we would send information out in multiple ways to make sure the health messages got out to community – social media, snail mail, email, telephone calls, and welfare visits.

We did keep our Fitzroy and Epping services open with a skeleton staff for those clients that did need face-to-face care. Every client who presented to our services was asked respiratory screening questions. This required a locked door to make sure only people without respiratory symptoms could enter our main building. Many people didn't like this as we've always had an open-door policy to welcome anyone. But we had to implement this to keep our staff safe. Clients with respiratory symptoms were directed to our onsite respiratory clinic, which was established during the pandemic and is still running now. All staff were fit-tested for N95 masks to ensure everyone had the optimal mask to minimise transmission. And our staff continued mask wearing well after mandatory requirements ended.

Another service we established during the pandemic was the 24/7 telephone crisis line, Yarning Safe 'n' Strong. Lives are saved with this service, which always has a trained counsellor available any time of the night or day. This was an important activity for community, especially for those who continued to follow restrictions even when the public health directions were lifted, because they were particularly vulnerable. Because this service was so beneficial, we have continued to operate it.

Across Victoria, we contacted all Aboriginal Community Controlled Organisations, (of which there are 35 across the state) and told them that we could support them – we could send these organisations health information as soon as we got it.

We have a really broad understanding of what 'health' means. We understand that social factors impact health. Our outreach workers also did welfare checks and they would help organise delivery of medications, food and other necessities so that our really vulnerable clients could stay home – Elders Connection program. We even sent out toilet paper in bulk – we did everything we could to keep our clients at home. Our transport drivers who taxied our clients between appointments before the pandemic became food and welfare supply couriers during the pandemic – and then became a message stick – passing on critical information to our clients and helping keep community informed. This also provided an important social connection, especially for the many people living alone.

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To help us do all of this work, we asked the department for additional support so we could purchase additional PPE, computers for telehealth activities and funding for social support. We received some contributions from the Commonwealth Government through the local Primary Health Network, but DH was our main support. There is a Koori tradition of 'only killing what you need'. This means that you only take what you need – you shouldn't be greedy. So, we only asked DH for things we really needed – and DH was always helpful and facilitated speedy outcomes.

We also tried to address misinformation from community – some people didn't think COVID-19 was that serious or they would express unfounded concerns about vaccines. Whenever we saw concerns or misinformation, VAHS would immediately respond. When the vaccines were rolled out, we wanted to make sure as many people as possible were protected. If an Aboriginal child was living with another family under child protection arrangements, we would vaccinate all children in that family – both Aboriginal and non-Aboriginal – so that the whole household was protected.

We organised for prominent Aboriginal Victorians to champion COVID-19 vaccination to community. VAHS ended up providing more than 11,000 COVID-19 vaccinations.

VAHS also helped the wider community, not just the Aboriginal community. When the public housing towers in Richmond went into restrictions, our outreach and community workers were asked to provide support to tower residents – and we did this for all residents, not just Aboriginal residents. This helped keep everyone safe at these difficult times.

VAHS is 51 years old and has had many accomplishments during this time. Looking back at this time of the pandemic, this was one of VAHS's finest hours. All of our skills and expertise came to the fore – our understanding of our community, our outreach workers, our understanding that social needs and culture impact health, our ability to adjust and pivot to whatever issue came our way. This was a great model of self-determination for others to follow – and it showed how Aboriginal services can do amazing things.

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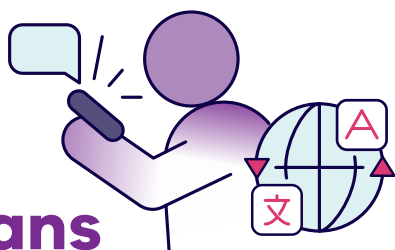
Tailored engagement with culturally and linguistically diverse communities

Over the course of the pandemic, Victoria improved its interaction with culturally and linguistically diverse (CALD) communities through a range of activities and through the cooperation of local community leaders in whom the community had trust (Department of Health, 2021).

The department delivered targeted messaging to communities during Orthodox Easter, Ramadan, Eid, Rosh Hashanah and other cultural events. Other key initiatives included setting up the CALD Communities Taskforce, partnering with local government areas with significant CALD communities, employing bicultural workers across key locations, and supporting families impacted by COVID-19 (Department of Health, 2021). This engagement was later expanded to ensure the 2021 vaccine program was trusted and accessible for CALD communities.

The government invested significantly in mainstream, local and tailored communication channels to address language barriers. This helped ensure the 1.5 million Victorians who speak a language other than English could access and understand public health messages about COVID-19 and the COVID-19 directions in a way that was meaningful to them and could be readily understood (Department of Health, 2021).

1.5 million Victorians



who speak a language other than English could access and understand public health messages about COVID-19 and the COVID-19 directions in a way that was meaningful to them and could be readily understood

The department delivered advertising and promotional campaigns in 57 languages to help all Victorians know what they needed to do to comply with public health directions and orders.

Part of the success of these engagement activities centred on the capacity building of community leaders, who were then able to provide evidence-based information to their communities (Department of Health, 2022a). Importantly, this engagement also helped ensure all Victorians understood what supports were available from local, Victorian and the Commonwealth Government. It was still important for those delivering the message to be able to validate messages by being able to say the message came from the Victorian Government and/or the Department of Health (Department of Health, 2022a).

The campaign was wide-reaching, appearing on television, outdoor advertising, in print, online and on trams, buses and road signage throughout Victoria.

Targeted campaigns appeared in local 'hot spots' where outbreaks had occurred or were predicted to occur. These were critically informed and supported by CALD community leaders and the Victorian Multicultural Commission, who appeared alongside the Chief Health Officer and government officials at community events to encourage cooperation with public health teams, promote safe behaviours and supports offered, and answer important questions. The National Ethnic and Multicultural Broadcasters' Council was funded to operate a regular multilingual news service in 19 languages, which was broadcast across 15 ethnic community radio stations, including 4 regional radio stations, delivering important updates on public health restrictions and the promotion of COVID-safe behaviours.

A personal story

Mohamed Mohideen was president of the Islamic Council of Victoria when he was asked to support the department's engagement with CALD communities as Manager of Priority Communities.

When the pandemic hit, it was an incredibly uncertain time for everyone, especially for people from CALD backgrounds. We have to remember that some people from CALD backgrounds had a very limited understanding of COVID-19 and health generally. With language barriers, many CALD communities struggled to understand the public health directions and what was required of them. Probably the most important task for me when I started in the department was trying to build trust and connections between multicultural communities and the department.

Trust was built by my small team going to faith communities, to cultural organisations, anywhere where people of CALD background assembled. We went to community venues, workplaces, temples, churches, mosques and synagogues and listened to people's concerns first and then started slowly addressing those concerns. And if we didn't know the answer, we were very honest in noting that and offering to find out and report back. This was another way of building trust.

Importantly, we utilised the expertise of CALD communities to advise the department how it should carry out the public health response. Over time, CALD communities came to see a much better response that was informed by their advice and which was nuanced and tailored to each community's specific needs.

We helped the department navigate these communities to help bring people along for the huge changes that were happening at that time. And the department leaders were very open to tailoring their messages when engaging with specific communities.

Providing translated information resources was important, but it was only part of the solution. We needed to meet communities to address questions that people had after receiving translated resources. So much of my team's work involved engaging with communities to answer those questions by using the skills of bicultural workers and 'public health ambassadors'.

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I built my team up so that we could meet with as many groups as possible – often online. There were so many people who had questions. One staff member attended more than 300 events.

And the range of community concerns was extensive. In the early days of the pandemic, there was uncertainty about the safety of preparation of a body for burial after someone had died from COVID-19. So, we developed guidelines for the Islamic community so this important religious activity could be undertaken safely.

The pandemic brought a number of longstanding issues to light. For example, some public housing sites had lifts, laundries or other services that were not working well. This made it very difficult for residents during periods of restrictions. Some people were living in very cramped conditions that made isolating difficult. Some of the public health responses in public housing towers were initially distressing for residents. We mobilised departments and community groups to provide additional support and ensured that culturally appropriate solutions were offered to address issues.

Some people from CALD backgrounds had arrived in Australia as undocumented arrivals or had overstayed their visas. Many of these people were apprehensive about presenting for testing for COVID-19 or were reluctant to seek medical care for fear of being deported. Again, we worked with department leaders and liaised with the Commonwealth so that everyone who needed to get tested for COVID-19 could do so without fear. And Victorian hospitals were directed to provide COVID-19 care to anyone regardless of Medicare eligibility, in order to protect them and public health.

When the COVID-19 vaccines were being rolled out, there were many issues raised by CALD community members. Some had heard outlandish claims about the vaccines and were concerned to present for vaccination. We spent a lot of time addressing these concerns – often by engaging with community leaders who were then able to work directly with their communities.

We also did a lot of work to make accessing COVID-19 vaccines easier. We identified ideal locations for pop-up vaccination clinics – often in places of worship – and tried to make the process for booking a vaccination much easier. Some community members struggled with online booking systems so we ensured people knew they could simply present to a vaccination centre and would be looked after. In the end, CALD communities had very good uptake of COVID-19 vaccines.

The Victorian public health response to the pandemic became really strong by openly taking feedback from multicultural communities and acting on it. The response has also informed other parts of government. The Coroners Court now has outreach workers who meet with religious and cultural groups to help address questions from these groups about court activities.

Specific initiatives for sensitive settings

The impact of quarantine measures on public housing high-rise towers in North Melbourne and Flemington demonstrated the need for a highly specialised support model that could operate at a larger and more comprehensive scale. In September 2020 the high-risk accommodation response began, initially focusing on public housing but soon expanding to include all people living in high-density and shared accommodation. This included rooming houses, caravan parks and state-funded supported residential services (DFFH, 2022). Victoria also set up the Victoria Disability Response Centre, in cooperation with the Commonwealth National Disability Insurance Agency, and with key representatives from sector and advocacy groups, to ensure wraparound support was provided to people living in disability residential services who might otherwise struggle to access services, such as testing and personal protective equipment (Premier of Victoria, 2020e).

The high mobility of casualised essential service workforces, particularly those operating across multiple sites and facilities, increased the risk of transmission across multiple high-risk settings. Payments supplied by both state and Commonwealth governments encouraged employers and employees to limit staff mobility across sites to reduce transmission and incursion into sensitive settings such as residential aged care and supported disability residential care.

To help bring testing to vulnerable and marginalised groups, 'roving' testing squads were established. These used best-practice community engagement approaches to identify communities and individuals who had difficulty accessing COVID-19 testing. They also negotiated testing sessions in locations that were accessible, welcoming and clinically safe (Department of Health, 2021).

Continuous improvement in case, contact and outbreak management

The department continuously improved its COVID-19 response according to emerging evidence, best practice and all that was learnt throughout the pandemic (Department of Health, 2021). This was especially true for contact tracing where major improvements were made throughout the second wave (and subsequent waves) to ensure all cases were rigorously investigated to identify all possible chains of transmission. Contact tracing was refined by knowledge of the particular transmission risks in different high-risk settings, and specialised outbreak response teams were set up in the department. This rigor in contact tracing was one of the reasons Victoria successfully got on top of the second wave in late 2020.

Regional Response Units

In July 2020 the department adopted a decentralised model for the regional Victorian response to COVID-19. It set up 6 COVID-19 Regional Response Units in 6 major regional health services to cover the 5 major regions – Barwon South West, Grampians Wimmera Southern, Loddon-Mallee, Hume and Gippsland. At that time, the department's own Case, Contact and Outbreak Management team continued to perform similar functions for metropolitan Melbourne, but limitations in workforce capacity and system constraints presented critical challenges when case numbers became very high. The decentralised approach applied in the regions was demonstrating that the presence of on-location frontline representatives for health protection activities was one way to overcome workforce capacity limitations.

So, in September 2020, aiming to enhance timely and reliable case identification, contact tracing and outbreak management in metropolitan Melbourne, the government decided to implement a similar model statewide. As the localised operations were now both regional and metropolitan, a new name was adopted – Local Public Health Units.

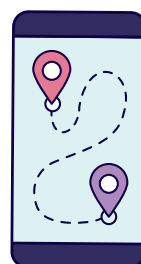
Local Public Health Units

Established in September 2020, Local Public Health Units played a pivotal role in outbreak management, including managing end-to-end COVID-19 contact tracing, case and contact follow-up and support. The units are based on a model that suits the needs of local communities and work collaboratively with departmental teams.

The units were set up in regional and suburban communities. This approach helped contain localised outbreaks and ensured tailored and localised responses could be quickly developed. The units were equipped to deal with everything from contact tracing to outbreak management, and they drew on their local knowledge to gauge how and where the virus was likely to spread in their communities. The locations of each unit were determined in consultation with health services and local government.

Victorians' compliance with public health and social measures

Victorians showed very high levels of compliance with public health and social measures in 2020 and 2021 when specific measures were in place. During the first and second waves, for example, when stay-at-home orders and other measures were in place, mobility levels reduced by as much as 80% according to anonymised smartphone location history, published by Google (Cunningham and Butt, 2021).



Mobility levels reduced by as much as 80% according to anonymised smartphone location history, published by Google

The commitment and engagement of the Victorian community was key in limiting the number of COVID-19 cases and deaths in both the first and second COVID-19 waves.

In the later months of 2021, while compliance was still significant, the same anonymised smartphone location history showed a reduction in compliance with stay-at-home orders and an increase in mobility (Cunningham and Butt, 2021). Public health experts from the Burnet Institute and the University of Melbourne stated that the reduced compliance with public health and social measures during the later months of 2021 was likely due to fatigue and exhaustion after almost 2 years of the pandemic (Toole and Baxter as reported in Cunningham and Butt, 2021). Similar findings were made in the 2024 Commonwealth Government COVID-19 Response Inquiry Report (Department of Prime Minister and Cabinet, 2024).

Social unrest

While there was some opposition to public health and social measures in 2020, in the later months of 2021 Melbourne, and other state capitals, saw the emergence of larger protests against public health and social measures and other issues related to the pandemic response, including COVID-19 vaccine mandates (Hermant, 2021) and proposed amendments to pandemic legislation in the *Public Health and Wellbeing Act 2008* (Convery, 2021; Stanton et al., 2021).

Some protesters promoted conspiracy theories related to 5G telecommunications or unproven treatments (Stanton et al., 2021).

While at some of these protests attendees were urged to wear masks and practise physical distancing, at others, some attendees were arrested as protests turned violent, resulting in protesters, police and bystanders being injured (Stanton et al., 2021). The Victorian Equal Opportunity and Human Rights Commission issued advice about protests at the time of Victoria's State of Emergency and the Chief Health Officer directions.

The commission noted that the rights to peaceful assembly, freedom of association and freedom of speech are critically important, but they are not absolute. The commission urged people to act in ways that did not violate the public health orders (Victorian Equal Opportunity and Human Rights Commission, 2020).

The Australian Health Protection Principal Committee urged people to not take part in mass gatherings and noted the possibility of people contracting COVID-19 from these events (Department of Health and Aged Care, 2020d).

Large-scale protests had reduced by the start of 2022.

Impact of the pandemic on family violence

During the pandemic, public health directions requiring home isolation exacerbated the risk of family violence, with the restrictions increasing opportunities for perpetrators to monitor and control victim survivors.

Throughout the pandemic the Victorian Government consistently communicated that victim survivors could leave home to escape family violence at any time regardless of public health directions. However, we know victim survivors found it more challenging to access support securely and discretely during this time (Pfitzner et al., 2020).

Victoria Police reported significantly higher numbers of incidents in June and October 2020. There was also an increase in first-time reporting and new forms of violence. These included tactics by perpetrators to socially isolate victim survivors and forms of violence specifically relating to the threat and risk of COVID-19 infection (Boxall and Morgan, 2020 and 2021; Pfitzner et al., 2020).

Service providers also reported seeing:

- increased complexity in client presentations, with victim survivors needing higher levels of psychosocial support – this included a loss of control due to the public health directions and stress from managing work, schooling and childcare responsibilities (Pfitzner et al., 2020)
- an increase in clients presenting with factors that exacerbated family violence – financial stress, drug and alcohol misuse, mental health issues and social isolation
- longer stays in emergency accommodation for victim survivors
- an increase in first-time service users, fewer referral options and the need to provide support for longer periods of time – this resulted in increased wait times for clients to access services such as men's behaviour change programs.

Challenges in service delivery and impacts

Frontline services continued to adapt to support women, children and families at risk during the pandemic. These services included crisis accommodation, police and courts, and sexual assault services. Maintaining contact and safe engagement with victim survivors was often especially challenging if they were isolating at home with the perpetrator (Pfitzner et al., 2020).

Remote working arrangements also had a detrimental effect on family violence practitioners. This increased stress and vicarious trauma. Practitioners felt greater responsibility for clients, worked longer hours to meet demand, and felt a blurring of boundaries between work and homes (Pfitzner et al., 2020).

A survey of family violence practitioners by the Monash Gender and Family Violence Prevention Centre found that responding to family violence from home during COVID-19 had a detrimental impact on practitioner wellbeing. Of survey respondents, 69% reported suffering moderate levels of burnout, and 37% reported moderate levels of secondary stress symptoms (Pfitzner et al., 2020).

The prevention workforce also reported increasing demands to redirect resources away from prevention activities towards response as the rate of family violence increased. Physical distancing requirements limited opportunities for face-to-face delivery of prevention programs.

Conversely, the pandemic created opportunities to adopt technological innovations and new service delivery models to manage the safety of victim survivors and keep perpetrators in view. These changes also increased accessibility of services to people living in regional, rural and remote areas.

Some service providers integrated family violence support into essential services. These included doctors' clinics, Centrelink and childcare. This assisted victim survivors who may have otherwise not sought help.

Organisations also created new alert systems, such as code words in telephone and text communication as well as physical signals, for victim survivors to discreetly signal when they needed support (Pfitzner et al., 2020).

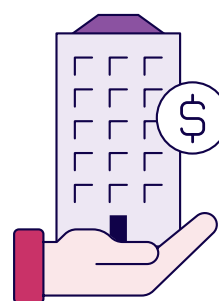
Many of these adaptations are still in use. They have enabled victim survivors to seek support in challenging and dangerous settings.

How we responded

As the impact of the pandemic on family violence became apparent, the government responded rapidly. We funded new initiatives and bolstered existing services to protect and support victim survivors and meet the increased demand for services.

This included:

- providing \$20 million for short-term accommodation for victim survivors who did not feel safe isolating or recovering from COVID-19 at home
- providing \$20.2 million to help Victorian family violence services meet the expected increase in demand during the pandemic and provide critical help for victim survivors
- implementing the Multicultural COVID-19 Family Violence Program – this funded 20 multicultural, faith-based and ethno-specific organisations to raise awareness of the drivers of family violence and support early intervention
- ensuring the availability of crisis accommodation and all family violence and sexual assault services, including The Orange Door



\$20 million
was provided for short-term accommodation for victim survivors who did not feel safe isolating or recovering from COVID-19 at home

- improving accessibility for perpetrators and people at risk of using violence to move into short- or long-term accommodation – this allowed victim survivors to remain in the family home
- launching Operation Ribbon in which police proactively checked on victim survivors' safety and wellbeing, and monitored perpetrators' behaviour to keep them in view
- increasing the accessibility of men's behaviour change programs by moving to online groups and one-on-one engagement to keep men who use violence in view (this also ensured support continued when face-to-face groups were suspended)
- fast-tracking the Magistrates' Court's Family Violence Intervention Order Online Form in 2020 to enable applicants to apply online, a critical innovation to help maintain access to justice
- building the capacity of family violence and sexual assault services, including Aboriginal Community Controlled Organisations, to provide dedicated support to adolescents who use violence and their families
- developing the COVID-19 Family Violence Data Portal launched on 2 November 2020 by the Crime Statistics Agency.



Family violence is discussed more in the 'Injury prevention' chapter.

A personal story

Nicky Cassidy was an associate nurse manager in Monash Medical Centre's emergency department, Clayton, in 2020.

In early 2020 we had heard about a new virus but did not know a lot about it. One of the first COVID-19 cases that presented to our emergency department (ED) was very unwell and we realised how serious this could be if this infection became widespread. I've been a nurse for 10 years – 9 of these working in an ED where I have seen and experienced many difficult presentations – but nothing was as difficult as what happened because of the pandemic in 2020.

Every aspect of our work changed. Some of the changes were significant: such as planning around who would get a ventilator if we became so busy that we had to ration these important pieces of equipment. Many of the changes were minor – but when the changes were put together, their combined impact was huge. And sometimes the pace of change was important. Our workflows – the processes and protocols which dictate how we work – were frequently changing.

To help support these changes, we also set up systems to check we were doing things correctly. One of these systems was the creation of 'spotters'. These are nurses who check that each nurse is wearing and using personal protective equipment (PPE) appropriately. We must remember that we were tired and drained at times and this is when mistakes with PPE can occur. Spotters helped us keep on top of PPE use to protect our patients, us and our colleagues.

Every aspect of our work changed. Many of the changes were minor – but when the changes were put together, their combined impact was huge. And sometimes the pace of change was important. Our workflows – the processes and protocols which dictate how we work – were frequently changing.

The roles of clinicians also changed because of the pandemic. Pre-COVID, most patients who needed intubation (mechanical breathing support) would have this performed by ED medical and nursing staff. For many patients with COVID-19, however, ventilation can be extremely difficult, so this frequently had to be performed by specialist anaesthesia staff. This took these specialist staff away from their regular work.

As 2020 progressed and the public health and social measures increased, the activities that would normally support us started to cease. Going to the gym, meeting family and friends, going to the beach – all started to become more difficult or actually stopped. Even the interaction with colleagues at work changed – we had to limit the number of staff in tearooms to help prevent inadvertent transmission of COVID-19. When the 5 km rule was introduced (where individuals had to limit their travel to within 5 km of their home unless for work or caring responsibilities) I was frequently stopped by the same police officers who had to ask why I was driving more than 5 km from my home.

Bizarrely, it seemed for a few weeks that these interactions with the police were the extent of my social interaction!

We were also fearful of contracting COVID-19 before the vaccines became available. Personally, I was concerned about catching the virus and taking it home to my family. This fear was another reason 2020 was such a hard year.

One of the hardest impacts on patients were the restrictions on visitors. For an extended period, adult patients were not allowed any visitors, while child patients were allowed one parent/guardian to support them. This meant that some patients were told life-changing information about their condition without the support of any family or friends. And sometimes patients were told this information over the telephone by me or my medical/nursing colleagues as we had to limit bedside conversations to limit the risk of COVID-19 transmission.

We have seen the impacts of patients who delayed seeking health care during the pandemic. Sometimes those impacts have been major – some patients now have much more serious health issues because of that delayed care.

The COVID-19 vaccines gave us hope that there would be a way out of the pandemic. I know the vaccine mandates were controversial for some people, but we have never had a global pandemic like COVID-19 in our lifetimes. The vaccines offered us a way to move on from all of the awful, tough experiences of that time.

While I survived the pandemic and was able to take on new opportunities at work with my experience, I'm aware that many of my colleagues have left health care because of the tough times we went through. Burnout is real, and it has resulted in a loss to our health system.

I don't take anything for granted anymore. I always knew we were fortunate in Australia, but I am even more aware of that now. And grateful.

Extensive PCR testing

During the second wave, PCR testing capacity continued to expand to a network of more than 180 fixed COVID-19 testing facilities across Victoria, led by health services, community health services, GP respiratory clinics, and sometimes provided at metropolitan drive-through retail centres. Testing was delivered in a variety of settings including walk-in, drive through, dual/hybrid models, Call-to-Test and mobile screening clinics.

A critical element of Victoria's COVID-19 testing regime was a focus to ensure fast turnaround times for test results to enable people to be identified and isolated quickly, or cleared to return to work, and other activities (Department of Health, 2021). The government invested \$36 million to expand pathology system capacity and maintain fast turnaround times, as well as improve coordination across the system. It also invested in extra staff, equipment and logistics and coordination to ensure at least 80% of results were released in under 24 hours (Department of Health, 2021).

The department's testing strategy focused on 3 main priorities:

- maximising symptomatic testing
- reducing transmission risk from interstate or overseas
- detecting asymptomatic infection in amplification settings where there is a risk of a large number of cases in a particular setting (Department of Health, 2021).

To effectively stop the spread of COVID-19, departmental staff had to find and test all suspected cases and ensure confirmed cases were promptly and effectively isolated and received appropriate care.

In August 2020 the department established Rapid Response Testing teams to:

- support management
- respond to COVID-19 risks
- undertake surveillance testing of high-risk industries.

These tailored teams consisted of testers, administration support and community engagement staff who were deployed to a location with everything they needed to set up and run a temporary testing facility. This allowed them to provide a highly flexible and responsive testing solution that could be mobilised quickly to different locations and settings. They built confidence and trust in priority communities through engagement and education with local government area communities. They worked together to support contact tracing and facilitate effective isolation in the event of an outbreak (Department of Health, 2021).

Increased access to testing and associated communications encouraged testing participation, particularly among communities that may not be frequent users of public health systems. To encourage greater community participation in testing, the department worked to improve customer experience – for example, by providing interpreter services, a best-practice customer complaints handling process and regular wait-time updates on our website (Department of Health, 2021).

Pathology laboratory testing underpinned Victoria's ability to identify COVID-19 cases swiftly and accurately and prevent transmission. Investments in public pathology equipment and staff were made to increase capacity and capability and reduce the state's reliance on private pathology laboratories (Department of Health, 2021).

When someone tested positive for COVID-19 in Victoria, a sample of the virus from that person was sent to the Victorian genomics public health laboratory at the Doherty Institute. The laboratory used the sample to identify the code of the virus from that person and which samples had the same, or very similar, strains of the virus. This allowed the spread of the virus to be tracked through the community.

On 11 October 2020 the Victorian Government announced that all those identified as close contacts of people with COVID-19 would have to be tested for COVID-19 on day 11 or thereafter of their quarantine period. If the test was negative, the person received a notice of clearance from the department (Public Accounts and Estimates Committee, 2021). If the test was positive, the department contacted the person with further advice. In the circumstances where a close contact did not agree to take the coronavirus test, they had to stay in quarantine for 24 days from their last exposure to the virus (Public Accounts and Estimates Committee, 2021).

The government extended the COVID-19 Worker Support Payment scheme in late July to ensure as soon as a person was tested, they were eligible for a \$300 COVID-19 Test Isolation Payment from the Victorian Government.

On 19 July 2020 the government announced new measures to minimise the spread of COVID-19 in the aged care sector. These included:

- a program to minimise workforce sharing across aged care sites
- infection control training for aged care workers
- collaboration with the private sector to increase capacity
- improved surveillance, testing and contact tracing (Public Accounts and Estimates Committee, 2021).

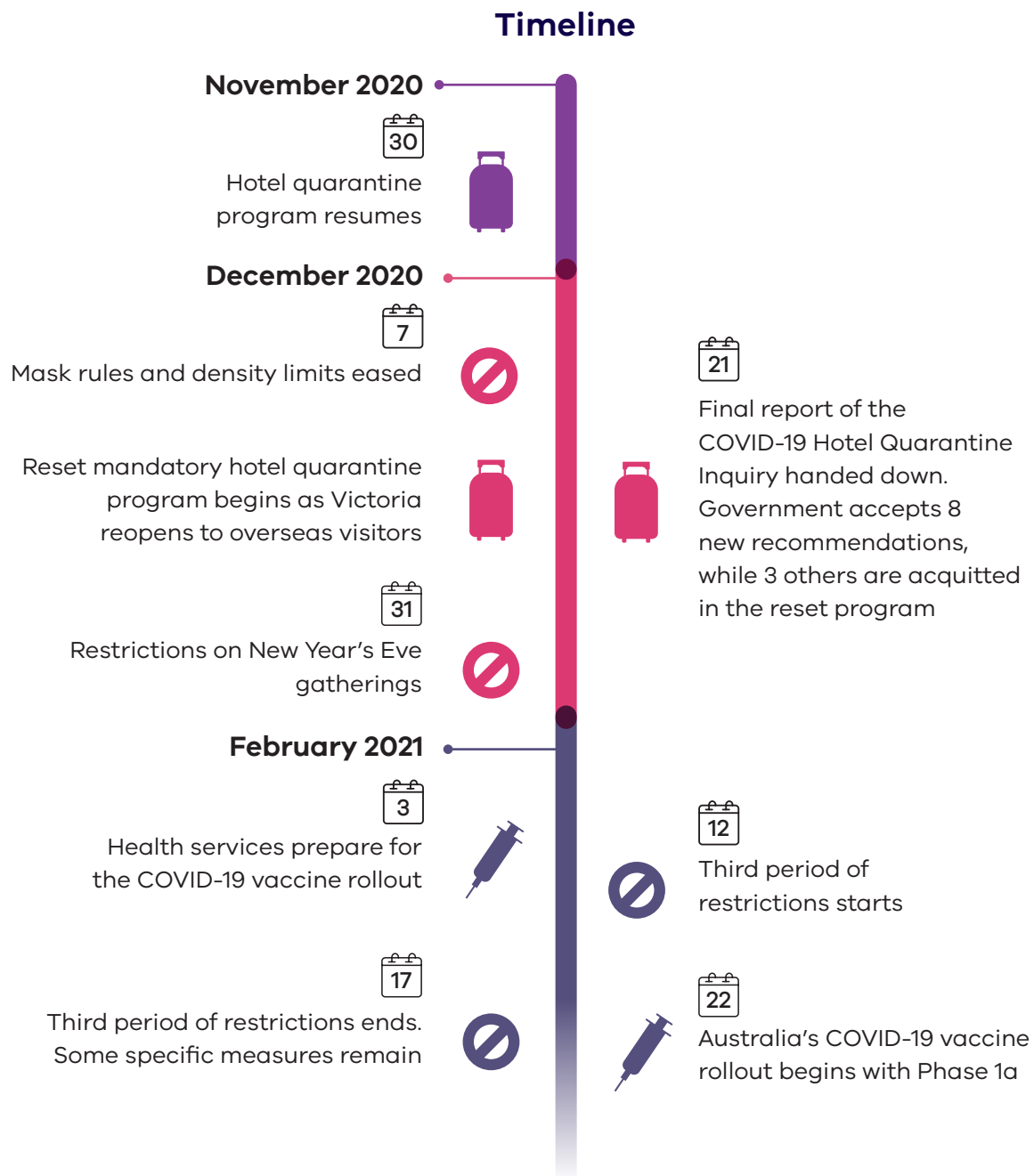
'High-risk industry' testing was also implemented from 4 September 2020 for the healthcare sector, with other industries following from October. Mandated testing began for meat, poultry and seafood processing, supermarket distribution centres, temperature-controlled perishable food distribution centres, and aged care workers (Public Accounts and Estimates Committee, 2021).

The emergence of the highly transmissible and deadly Delta variant coincided with the initial phases of the vaccine rollout. Vaccines were targeted towards highly vulnerable populations including those with comorbidities that increased their risk of severe disease or death if they acquired COVID-19. Initial vaccine doses were delivered to people living in public housing, residential care and hard-to-reach accommodation who met eligibility criteria. Community health services played a pivotal role in delivering in-reach vaccination, testing and treatment. A range of vaccination strategies including targeted 'blitzes' were also put in place to ensure residents and staff in aged and disability care services received priority in the first phases of vaccination.

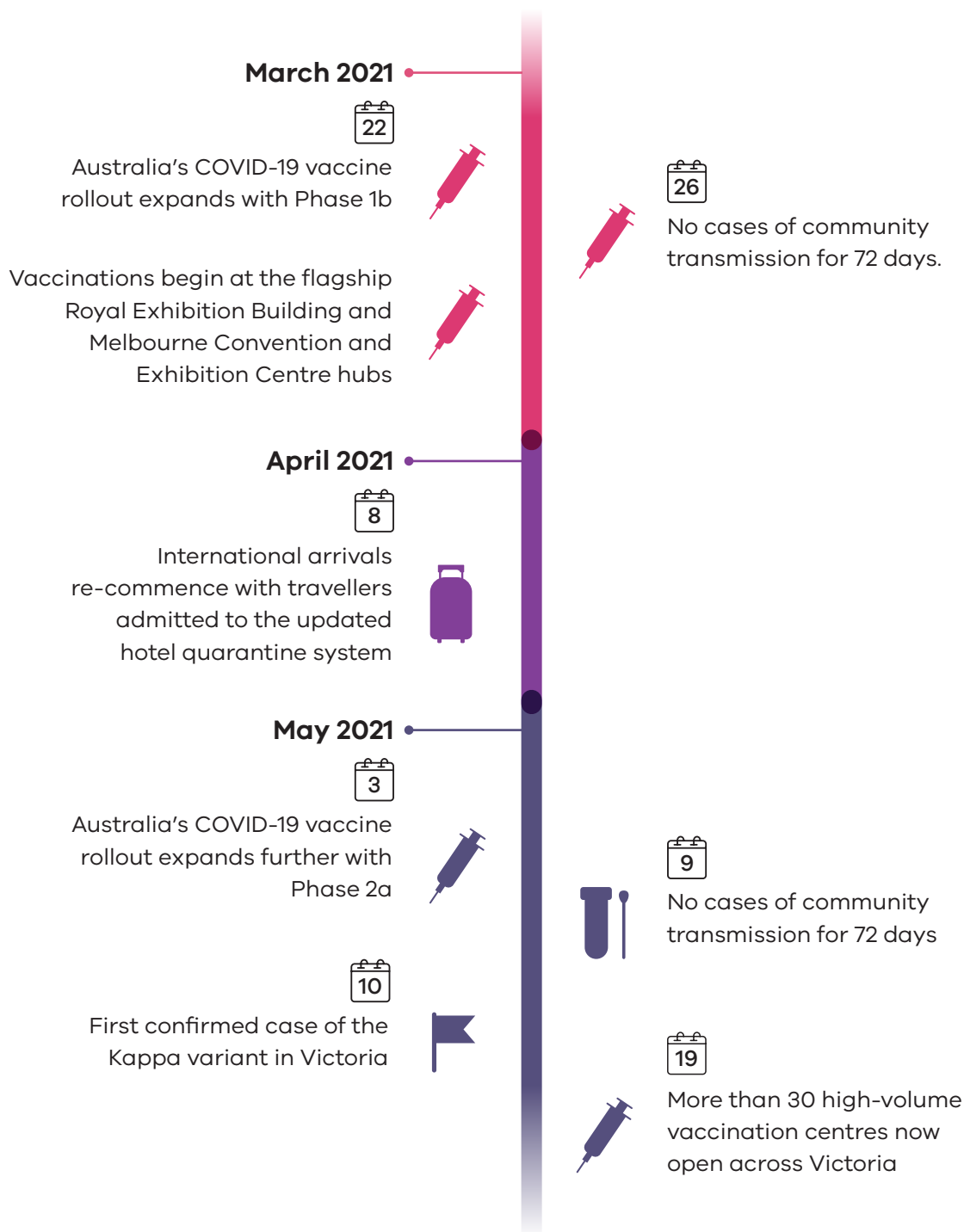
Coming out of the second wave







Public health and social measures were wound back from late October 2020 and, in November 2020, COVID-19 was epidemiologically eliminated from Victoria – that is, no new cases of community transmission were reported for 28 days – a unique international achievement at that time (Department of Health, 2021).

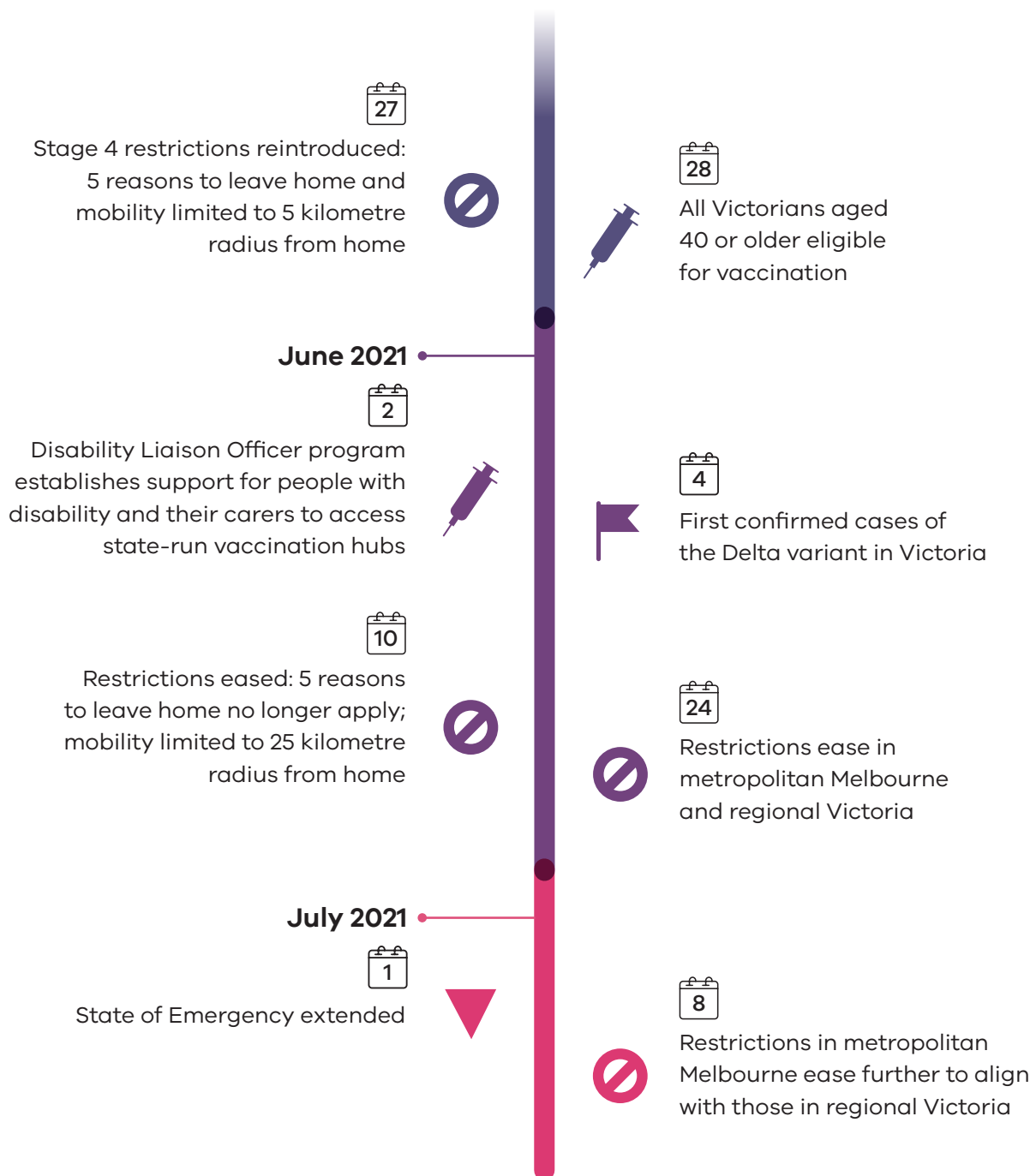
Interwave phase



Key						
	Key point	Vaccination	Restrictions	Testing	Travel	Hotel quarantine
						Victorian Government



Key							
	Key point	Vaccination	Restrictions	Testing	Travel	Hotel quarantine	Victorian Government



Key							
	Key point	Vaccination	Restrictions	Testing	Travel	Hotel quarantine	Victorian Government

Post-second wave, interwave phase: 28 November 2020 to 11 July 2021

Data and key points

The interwave phase between the second and third waves started on 28 November 2020, the day after local elimination was achieved, and ended on 11 July 2021. Victoria recorded 393 COVID-19 cases during this period.

Epidemiological summary

In this phase, small outbreaks were contained. Hotel quarantine resumed on 7 December and cases were detected in returned travellers across this period.

In late December 2020 an outbreak in Victoria genomically linked to an outbreak in New South Wales resulted in a large list of exposure sites. Restrictions were tightened over the New Year period in response to this outbreak, which was contained by early January.

In February 2021 an outbreak originating from the Holiday Inn Airport quarantine hotel where staff and their contacts were infected triggered a 5-day statewide 'circuit breaker' restriction period from 13 February to 18 February 2021. Twenty-two locally acquired cases resulted from this outbreak.

In May 2021 an outbreak of the Kappa variant of concern (B.1.617) occurred in Victoria. The first case in this outbreak was diagnosed on 24 May 2021. A 2-week 'circuit breaker' restriction period began on 28 May 2021 and was extended on 4 June 2021 until restrictions were eased on 11 June 2021.

Demographics

- The median age of COVID-19 cases in Victoria was 32 years.
- 56.2% of cases were male.
- 80% of cases lived in metropolitan Melbourne.
- 4.8% of cases (19 people) were healthcare workers.

Epidemiological characteristics

- Over half (55%) of all infections were overseas acquired (in the hotel quarantine program), while the remainder were acquired in Australia.
- 59% of cases reported symptoms at testing.

Outcomes

- 22 cases were hospitalised (5.6% of all cases). The median age of hospitalised cases was 60 years.
- 8 cases were admitted to intensive care, and none were ventilated.
- 0 COVID-19 deaths were reported.

Testing

- Over 2.8 million PCR tests were processed in this phase (2,898,979 tests).

Aged care settings

- 1% of cases (4 people) were aged care residents. 3 of these 4 aged care resident cases were hospitalised.
- 5 cases were staff in residential aged care settings

Interwave phase – context

Despite the success in controlling the second wave in late 2020, transmission of COVID-19 via international arrivals and from interstate outbreaks remained an ongoing challenge throughout late 2020 and into 2021. Incursions in 2021 were especially challenging due to the emergence of more contagious and deadly COVID-19 variants.

Multiple outbreaks in Victoria involving the Alpha and Kappa variants occurred in early and mid-2021, and the first Delta variant case was detected in Victoria in early June 2021. These outbreaks were quickly brought under control with improved contact tracing and brief, sharp escalations in restrictions in February, May and June 2021 (Department of Health, 2021).

The significant advantage seen globally at this time was the introduction of COVID-19 vaccines. While the overall vaccination program was a Commonwealth responsibility, the states and territories had a key role to play in the rollout. This included managing logistics, vaccination delivery, safety and reporting (Department of Health, 2021).

Victoria rolled out the COVID-19 vaccine rapidly, in line with vaccine product supply and in keeping with the Commonwealth's prioritisation framework. The government commissioned a range of providers to set up vaccine access points across Victoria, with several models to meet the access needs of different cohorts and communities (Department of Health, 2021).



Victoria's COVID-19 vaccination program is discussed more in the 'Interwave phase – Victoria's COVID-19 vaccination program' section.

COVID-19 variants

All viruses, including the virus that causes COVID-19, change over time. Most changes have little to no impact on the virus's properties. Some changes, however, may affect how easily the virus spreads, the associated disease severity or the performance of vaccines, therapeutic medicines, diagnostic tools or other public health and social measures (WHO, 2024).

In late 2020 the emergence of variants that posed an increased risk to global public health prompted the World Health Organization (WHO) to characterise some as variants of interest and variants of concern (Table 5). This was to prioritise global monitoring and research and to inform and adjust the COVID-19 response. From May 2021 onwards, WHO began assigning simple, easy-to-say labels for key variants. The prominent COVID-19 variants were Alpha, Beta, Delta and Omicron (WHO, 2024).

Table 5: Key variants of concern and interest

WHO label	Earliest documented samples (global)	Date of designation	Earliest documented samples (Australia)
Alpha	United Kingdom, September 2020	18 December 2020	11 December 2020
Beta	South Africa, May 2020	18 December 2020	27 January 2021
Gamma	Brazil, November 2020	11 January 2021	1 March 2021
Delta	India, October 2020	11 May 2021	18 April 2021
Kappa	India, December 2020	4 April 2021 (variant of interest)	9 April 2021
Omicron	South Africa, November 2020	26 November 2020	2 December 2021

New strains developed independently of each other around the world – the Alpha strain in the United Kingdom, Beta in South Africa and Gamma in Brazil, all in 2020. Alpha infections surged in December of that year. It was soon detected around the world and became the dominant variant. With each new variant, transmissibility increased through higher viral loads in the upper respiratory tract or spike protein deletions that are linked to immune escape (Hutchinson et al., 2021).

The Beta variant (B.1.351) showed vaccine escape, with reduced efficacy to several vaccines and lower levels of immunity following vaccination or infection (MacIntyre, 2021).

Alpha faded away with the rise of the more aggressive Delta variant. Delta was first identified in India in late 2020; it soon spread throughout the world. This variant had several spike protein mutations, which played a role in its increased transmissibility. Delta was dominant until Omicron took its place in mid-December 2021. Omicron was first identified in Botswana and South Africa in late November 2021, and cases quickly began to surface and multiply in other countries.

By late December 2021, Omicron was causing daily case numbers in Australia to surge dramatically. This is related to the many more mutations seen in the spike protein of the virus, likely causing a large increase in transmissibility and infectivity compared with the Delta virus (Duong BV, Larpruenrudee P, Fang T, et al., 2022). The more rapid person-to-person transmission of the Omicron variant essentially rendered contact tracing ineffective as an approach to contain spread of the virus. Accordingly, the department moved away from contact tracing and isolation as the primary means of control to self-testing and quarantine: in late December 2021 and January 2022, changes were made to a number of protocols, including those related to contact tracing, testing, case interviews, isolation and quarantine requirements to address the impacts of the Omicron variant.

Victoria's COVID-19 vaccination program

Victoria's COVID-19 vaccination program began on 22 February 2021. It had to be flexible in response to significant changes in the social, political and media context, and various levels of COVID-19 vaccine supply and demand and system capacity. The program integrated international best practice. An implicit recognition of the social determinants of health and their influence on health equity underpinned the program.

To help ensure all Victorians had access to a COVID-19 vaccine as soon as possible, the department established 169 state-run vaccination centres across Victoria (Department of Health, 2022b). In partnership with primary care providers (GPs and pharmacists) the program allowed Victorians to get vaccinated quickly and safely. Outreach and mobile vaccine teams brought vaccinations to community events, schools, places of worship, aged care settings and other at-risk communities across the state. In particular, the department partnered with Aboriginal Community Controlled Organisations to close the gap between Aboriginal and non-Aboriginal vaccination rates (Department of Health, 2022a).

The government established clear goals and objectives for the vaccination program, which sought to:

- ensure equity of access and uptake of vaccines
- deliver a safe and high-quality vaccination program
- establish and maintain community trust and confidence in the program.

Rollout – prioritisation

Under the direction of the Commonwealth Department of Health and Aged Care, the COVID-19 vaccine was rolled out in phases to ensure the first available doses were directed to the highest priority subgroups (Table 6). Informed by advice from the Australian Technical Advisory Group on Immunisation (ATAGI), the Commonwealth Government's COVID-19 vaccine national rollout strategy specified priority populations for vaccination and the phases in which vaccines were to be provided.

Table 6: Planned phases for the COVID-19 vaccine rollout

Phase 1a	Phase 1b	Phase 2a	Phase 2b	Phase 3
Quarantine and border workers	Adults \geq 80 years or older	Adults aged 60–69 years	Balance of adult population	< 18 if recommended
Frontline healthcare worker sub-groups for prioritisation	Adults aged 70–79 years	Adults aged 50–59 years	Catch up of any unvaccinated Victorians from previous phases	
Aged care and disability care staff	Other healthcare workers	Aboriginal people 18–54 years		
Aged care and disability care residents	Aboriginal people > 55 years	Other critical and high-risk workers		
	Younger adults with an underlying medical condition, including those with disability			
	Critical and high-risk workers including defence, police, fire, emergency services and meat processing			

Source: Department of Health and Aged Care, 2021a

Victoria's *COVID-19 vaccination program implementation plan* sought to operationalise the Commonwealth's staged rollout within the local context and took extra steps to identify priority groups on the basis of 'people, places and workplaces' where there was elevated risk of COVID-19 (Table 7).

Table 7: Priority groups: people, place, workplaces

Priority people	Priority places	Priority workplaces
Culturally diverse communities, newly arrived migrants	Local government areas with the highest and/or most complex COVID-19 cases	Workplaces with previous outbreaks: <ul style="list-style-type: none"> • aged care • meat processing facilities • supermarket distribution • health services • hospitals
Aboriginal Victorians	Local government areas/postcodes with slower dose one uptake	Ports of entry
People with existing health issues		Quarantine facilities
Younger and older Victorians		Corrections facilities
People with disability		
Residents of aged care facilities		
Older population		
Unpaid carers		

Victoria's vaccination program used a range of strategies to target and support access for priority groups, in particular Aboriginal people, culturally diverse communities, and people with disability. Australian Immunisation Register data was used to better understand variation in vaccination rates and to inform targeted approaches for these priority cohorts.

Equity of access

Between 22 February 2021 and 30 December 2021, 11,312,029 COVID-19 vaccinations were administered by immunisation providers in Victoria; 4,936,981 by state facilities and 6,375,048 by Commonwealth providers (Table 8). Among Victorians aged 12 years or older, 5,345,923 received one vaccine dose, with 5,255,648 receiving 2 or more doses to be considered fully vaccinated (Department of Health and Aged Care, 2021b) (Table 9).



11,312,029
COVID-19 vaccinations
were administered by
immunisation providers
in Victoria



4,936,981
by state facilities



6,375,048
by Commonwealth providers

Table 8: Number of vaccinations administered by immunisation providers in Victoria, 2021–2022

State-run facilities	Commonwealth providers	Total
4,936,981	6,375,048	11,312,029

Table 9: Number of Victorians aged 12 or older who received COVID-19 vaccinations, 2021–2022

One vaccine dose	Two or more vaccine doses
5,345,923	5,255,648

By the end of 2021, more than 92% of the eligible population had received at least 2 doses of COVID-19 vaccines, as shown in Figure 6 (Department of Health, 2022a).

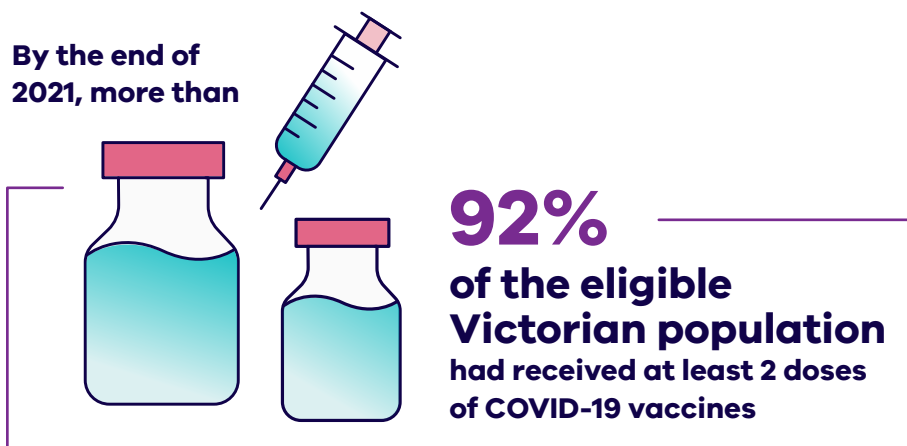
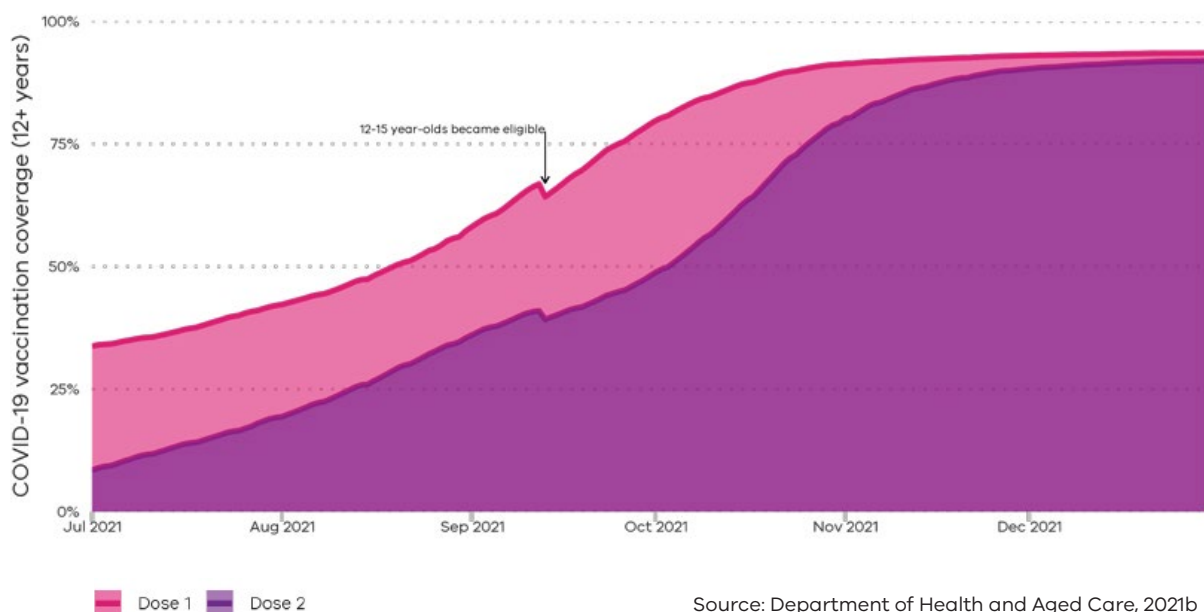


Figure 6: COVID-19 vaccination coverage, Victorians aged 12 years or older, 1 July to 31 December 2021



Source: Department of Health and Aged Care, 2021b

Vaccination services were delivered through primary care and Commonwealth-led in-reach services and targeted Victorian initiatives. Victoria's initiatives included a combination of state-run vaccination centres and outreach services including localised, mobile, pop-up and targeted options. These initiatives were implemented to support equitable access to COVID-19 vaccines, address geographic challenges and proactively respond to the needs of priority cohorts.

Equity of access – COVID-19 vaccination workforce

Equity of access was strongly dependent on having an appropriate, well-trained workforce in place. Victoria's COVID-19 vaccination program focused on increasing the efficiency and capacity of the existing immunisation workforce as well as identifying, engaging and training extra emergency authorised workforces. This strategy:

- improved access to COVID-19 immunisation services
- increased workforce capacity and flexibility during peak periods
- facilitated more efficient immunisation service delivery.

Medical practitioners, nurse practitioners, nurse immunisers, Aboriginal health practitioners and pharmacist immunisers played a vital role. This was not only in preparing and administering COVID-19 vaccines but also managing, supervising and supporting emergency authorised vaccination workforces.

Emergency authorised workforces had pre-existing skills and competencies. This meant that they were well positioned to upskill and contribute to the program. These workforces had to complete mandatory Commonwealth and Victorian COVID-19 vaccine training programs and undertake a competency assessment to ensure they had the knowledge and skills to safely prepare and administer COVID-19 vaccines.

Emergency authorised workforces could take part in vaccination efforts across a range of settings to ensure support for primary care, health services and other organisations delivering the vaccination program.

All workforces taking part in Victoria's COVID-19 vaccination program were critical to its success and ensured all Victorians could access information, advice and lifesaving vaccines to keep themselves and their community safe.

Safety and quality

Victoria achieved a safe and high-quality vaccination program by building on existing vaccine safety, clinical management and surveillance frameworks. These structures and processes were adapted for the specific context of the COVID-19 pandemic:

- Comprehensive clinical guidelines were developed to support clinical safety and quality practice at vaccination sites. These were regularly reviewed and updated to reflect emerging evidence and guidance issued by the Commonwealth Government and ATAGI.
- Surveillance of Adverse Events Following Immunisation in the Community (SAEFVIC) adapted its existing adverse events monitoring processes to apply to the collective COVID-19 vaccination effort.
- The Victorian Specialist Immunisation Service also facilitated safe vaccination of those at higher risk of adverse events, or with complex needs relevant to vaccination.

Trust and confidence

Establishing and maintaining community trust and confidence in Victoria's COVID-19 vaccination program was critical to its success.

Extensive community partnerships and engagement was initiated early in the vaccine rollout with peak bodies, local government and community organisations, and through the Ambassadors Program and Clinical and Communities Champions.

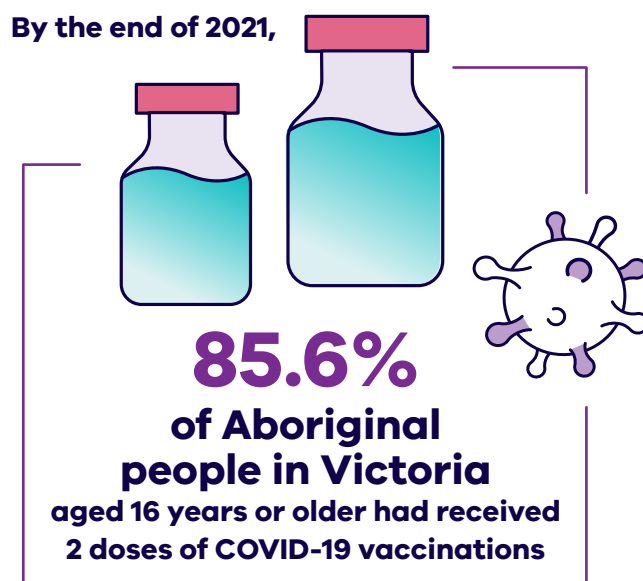
Local, visible advocates and representatives from Victorian communities built trust and confidence among Victorians, leading to one of the highest levels of vaccination in the world.

COVID-19 vaccination and Aboriginal Victorians

Early in the pandemic, global organisations held serious concerns for the risks COVID-19 posed to First Nations communities around the world (United Nations Office of the High Commissioner for Human Rights, 2020). These concerns were echoed in Australia, related to lower access to health services, greater levels of disadvantage and lower life expectancy experienced in Australia's First Nations communities (Keene, 2020).

The Aboriginal community-controlled health sector played a pivotal role in supporting Aboriginal communities to help protect themselves, their families and the broader community, especially older Aboriginal people and Elders, during the pandemic. Aboriginal health services set up testing clinics and worked to support the local community to continue to manage their health conditions through providing culturally safe health services online and via telehealth.

This sector was also a key partner to the department in rolling out COVID-19 vaccinations. By the end of 2021, 85.6% of Aboriginal people in Victoria aged 16 years or older had received 2 doses of COVID-19 vaccinations, compared the national vaccination rate for Aboriginal people aged 16 years or older of 71.0%. In Victoria, 21 Aboriginal Community Controlled Organisations were providing COVID-19 vaccinations during 2021 (Operation COVID Shield, 2022).

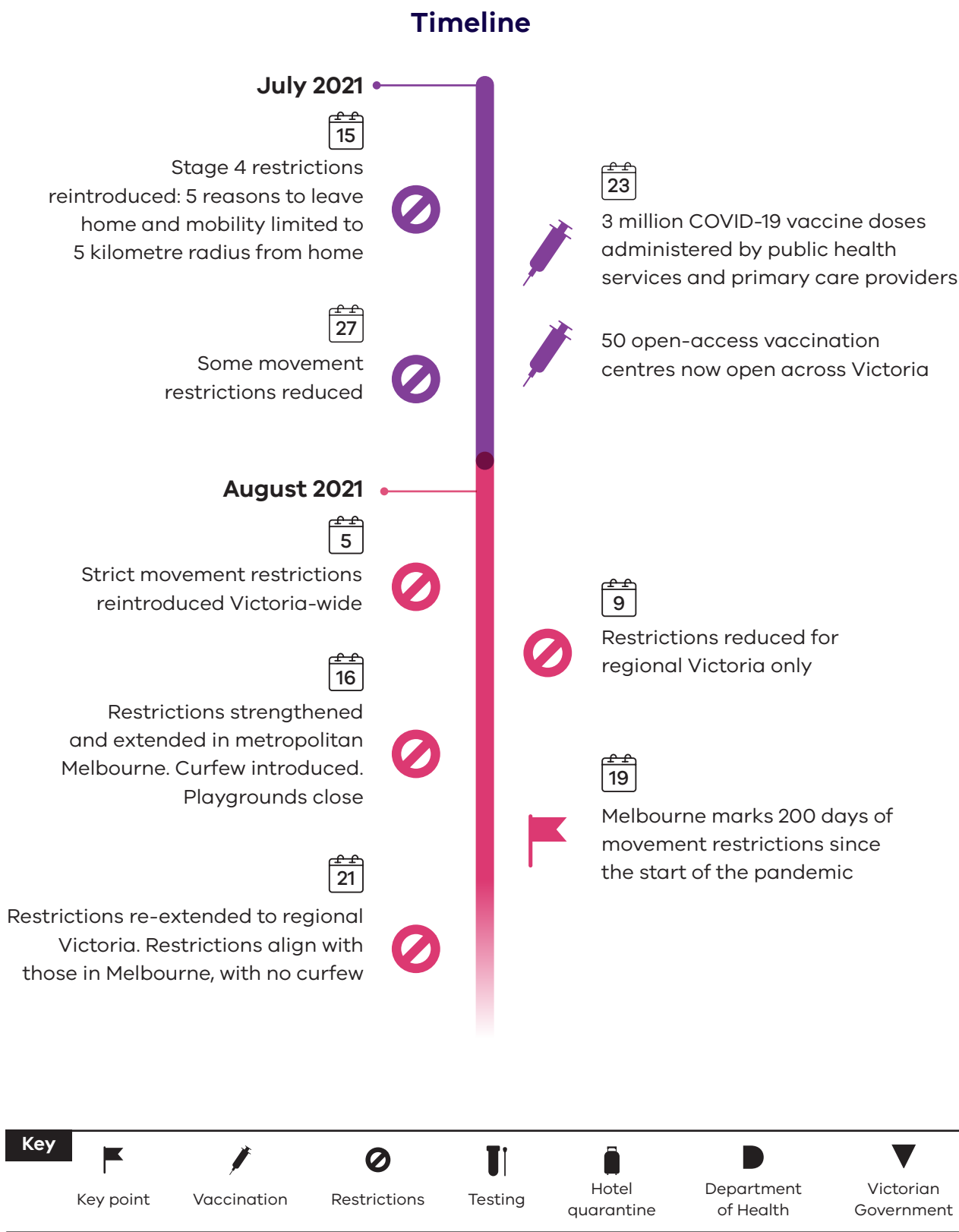


Also in 2021, the government issued a Public Health Emergency Order to enable Aboriginal health practitioners in Victoria to administer COVID-19 vaccines (Secretary to the Department of Health, 2021). This supported increased vaccination access and uptake for Aboriginal communities (Naren et al., 2021). The provision of vaccinations by Aboriginal health practitioners has continued and become normal practice after the COVID-19 pandemic.

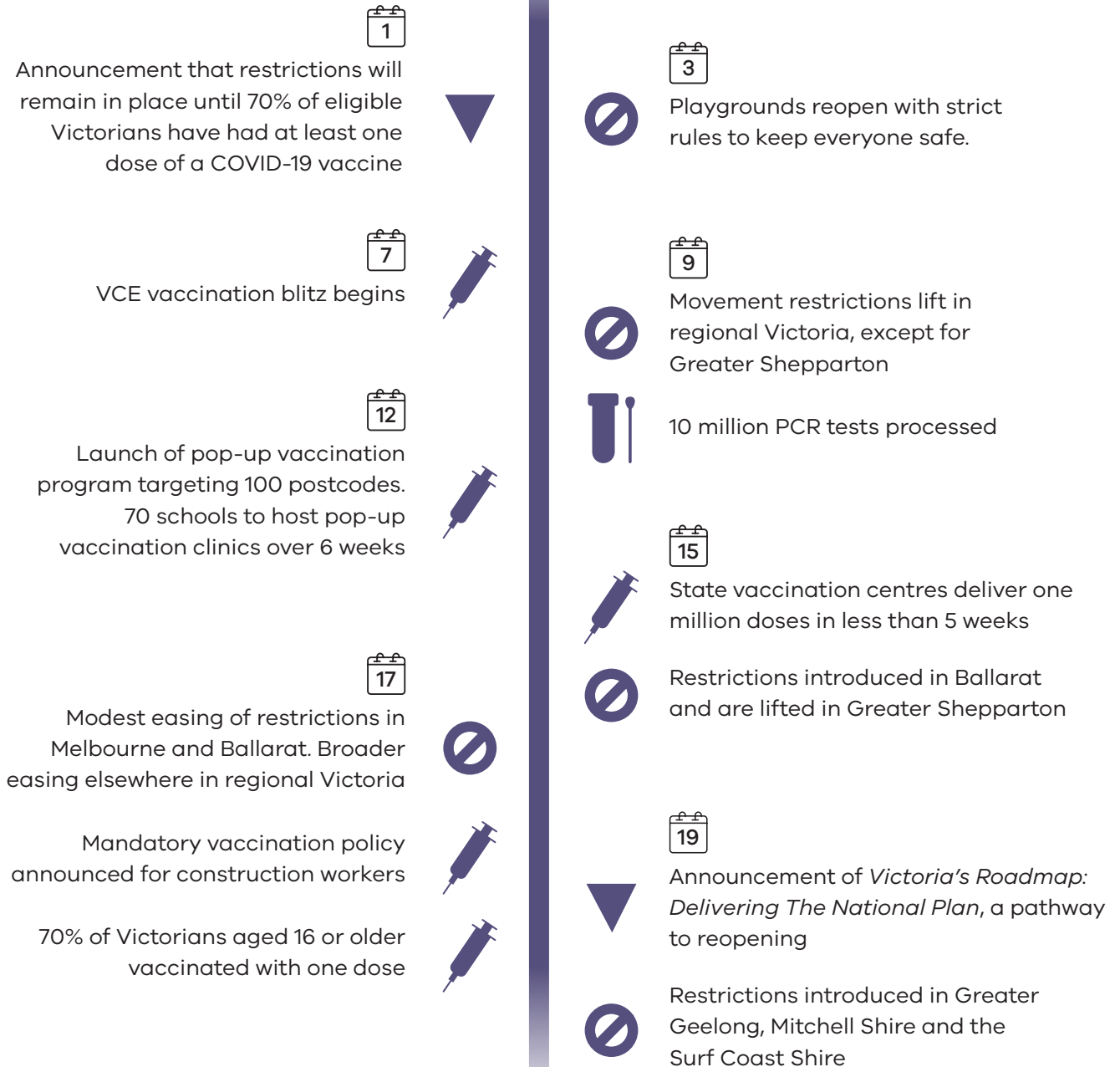


The impact of the COVID-19 pandemic on Aboriginal Victorians is discussed more in the 'Health inequalities' chapter.

Third wave

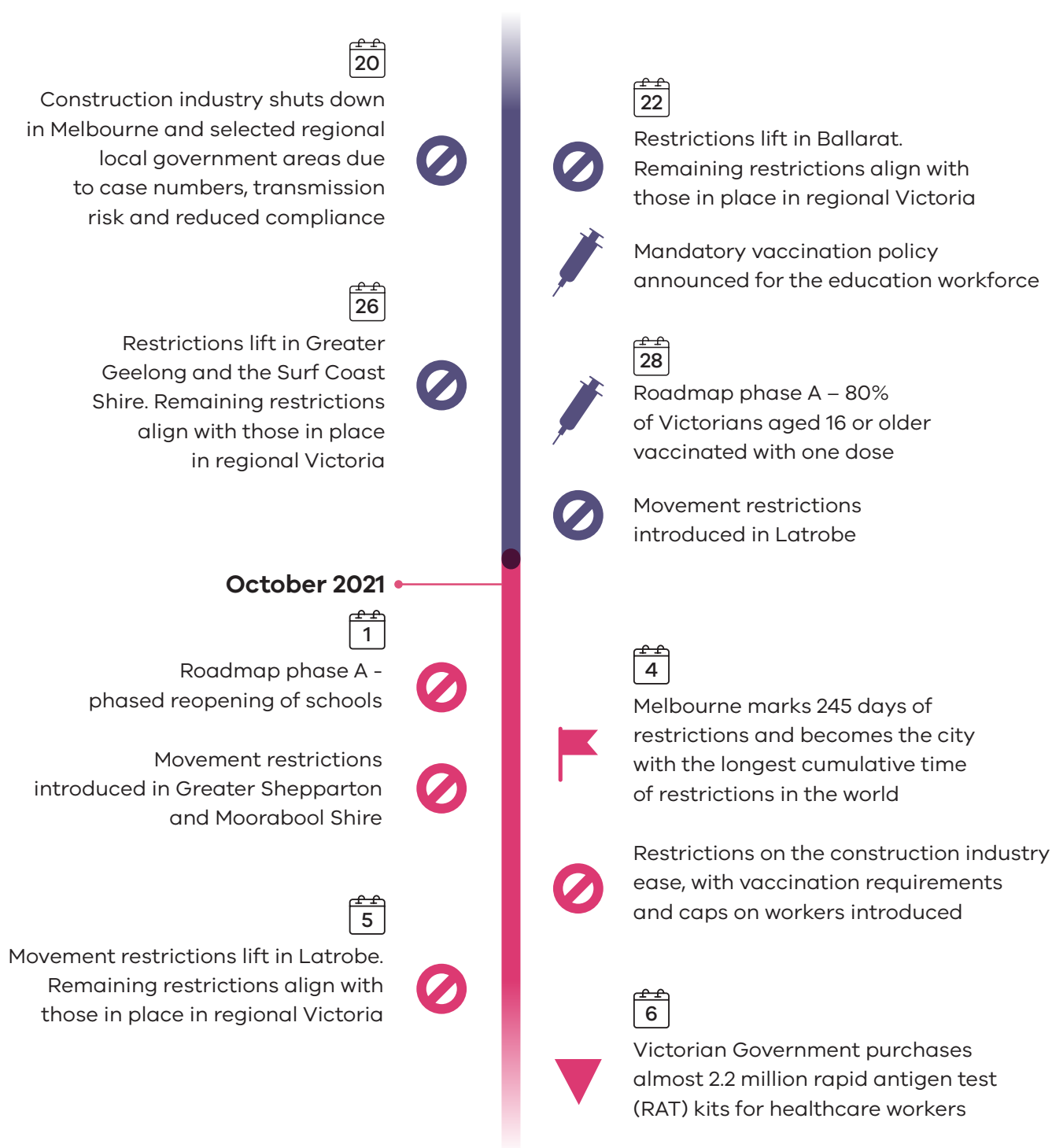


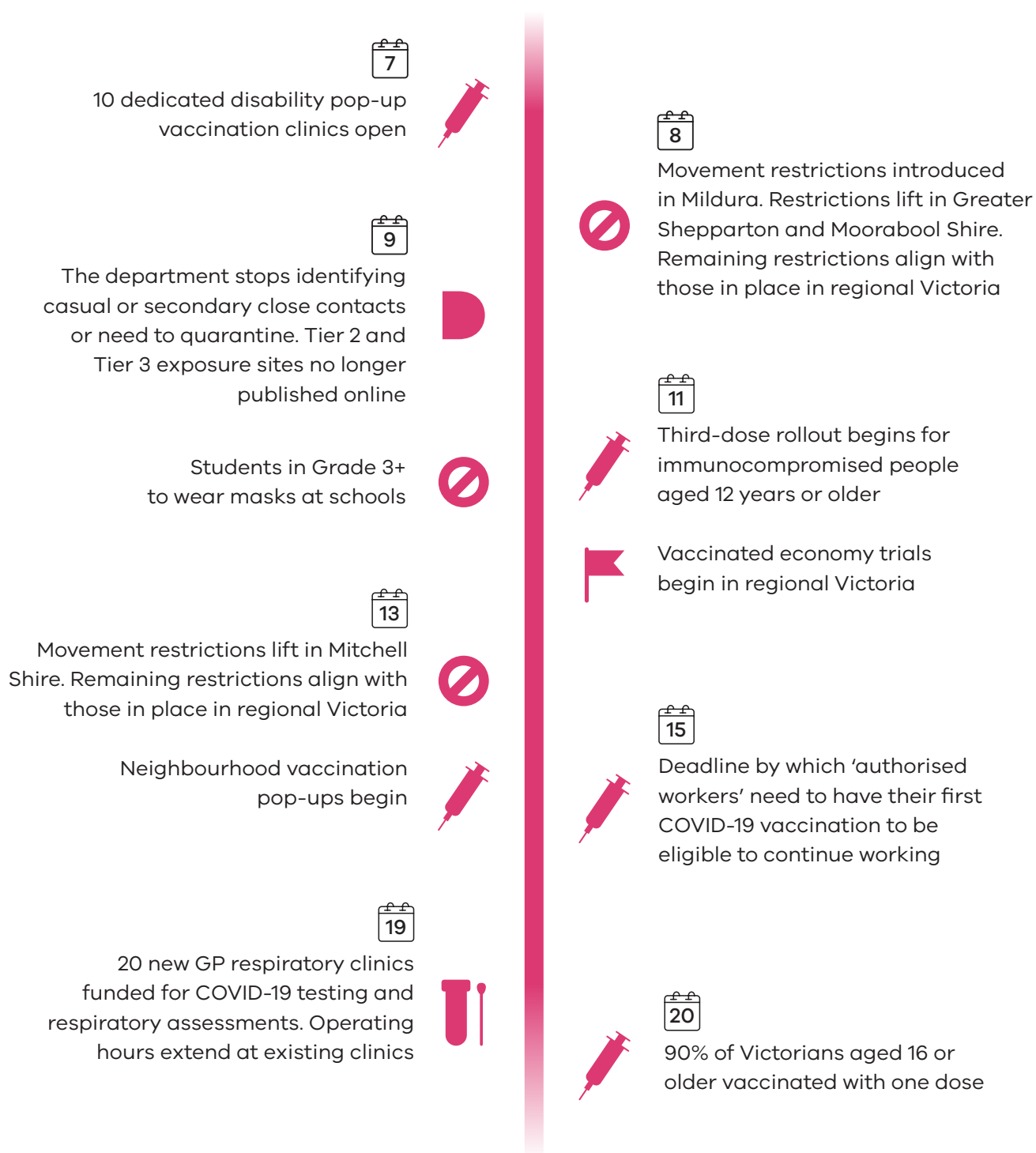
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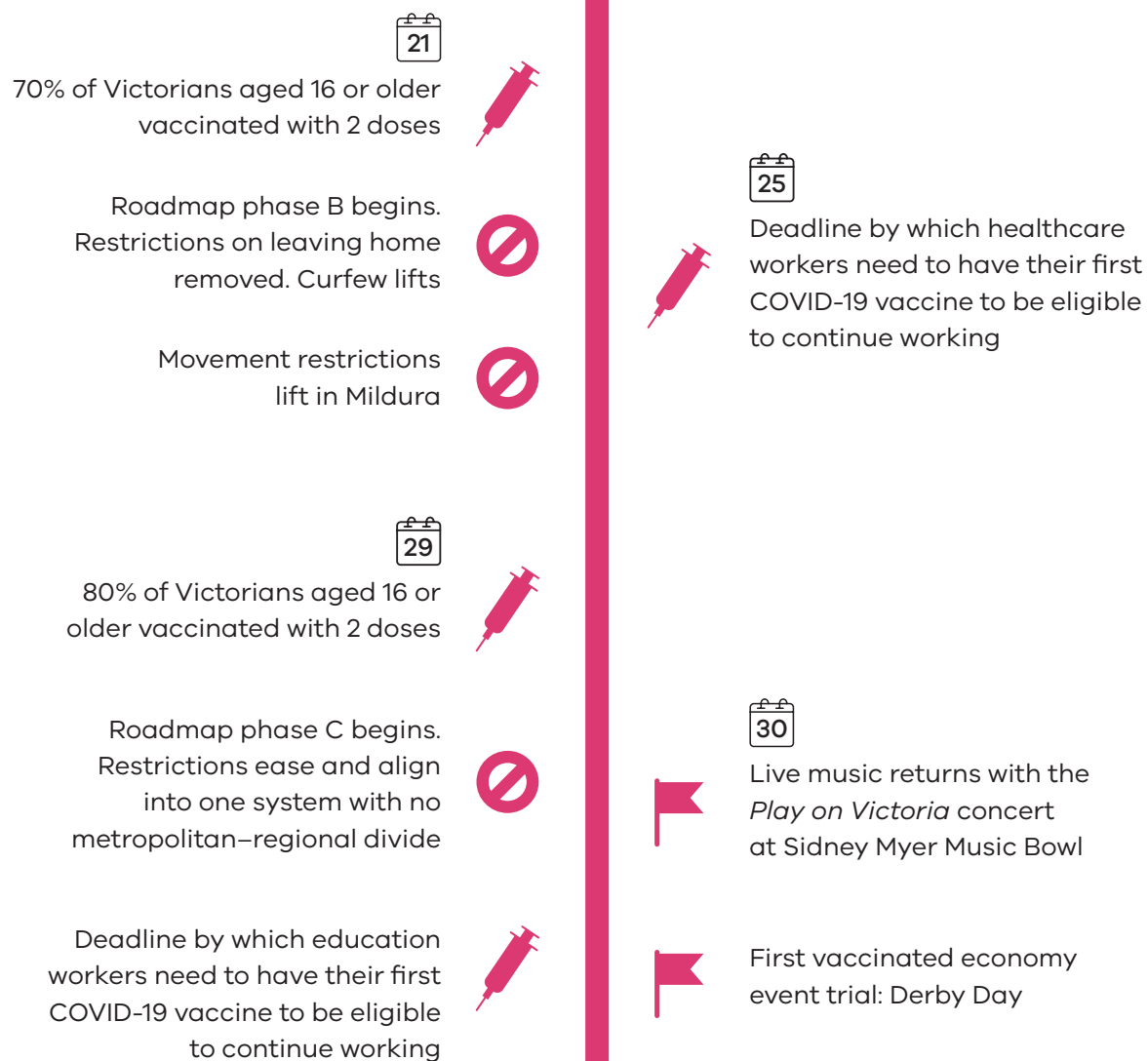
Key

Key point	Vaccination	Restrictions	Testing	Hotel quarantine	Department of Health	Victorian Government



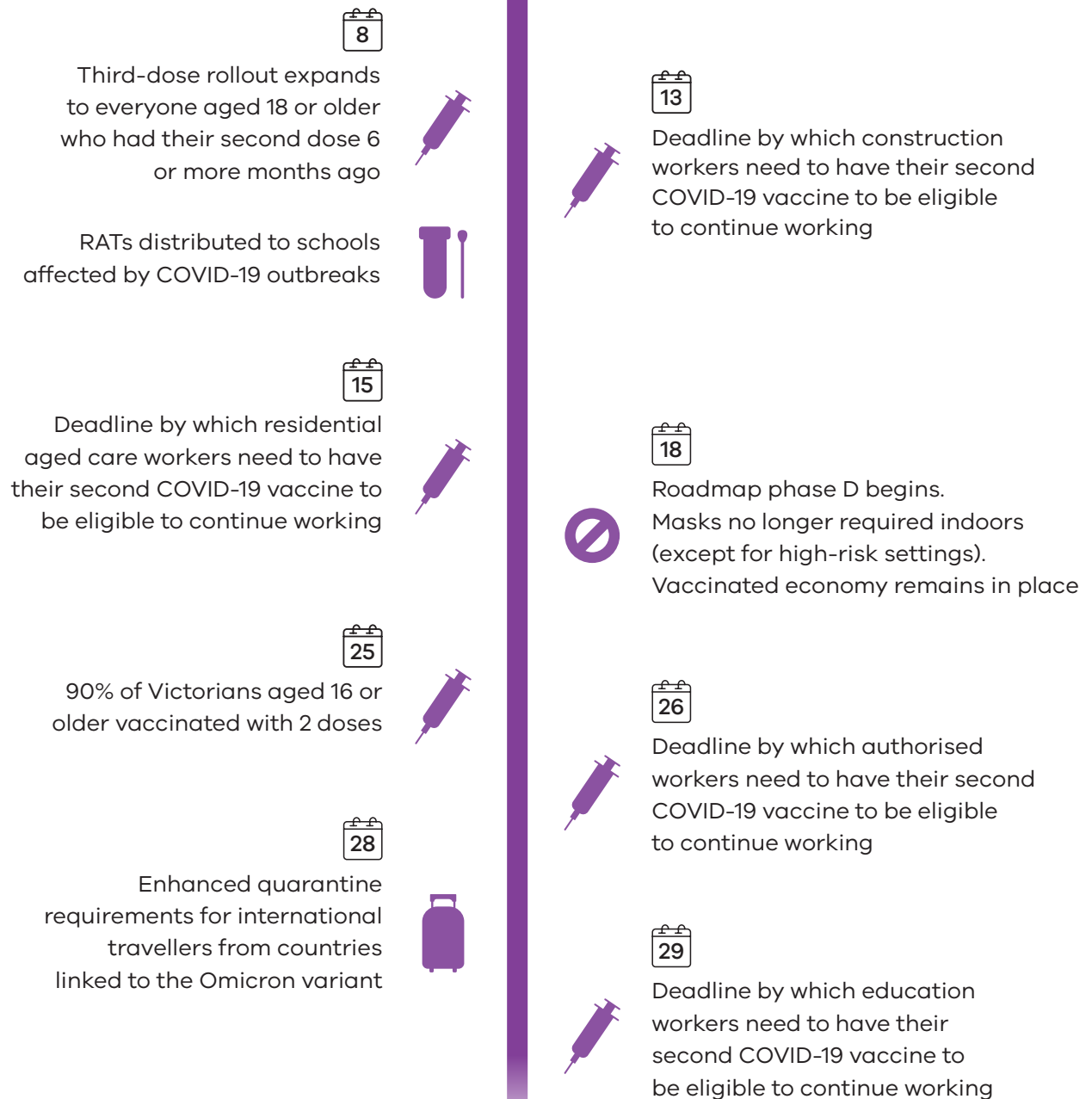


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Key							
	Key point	Vaccination	Restrictions	Testing	Hotel quarantine	Department of Health	Victorian Government

November 2021



Key



Key point



Vaccination



Restrictions



Testing



Hotel quarantine

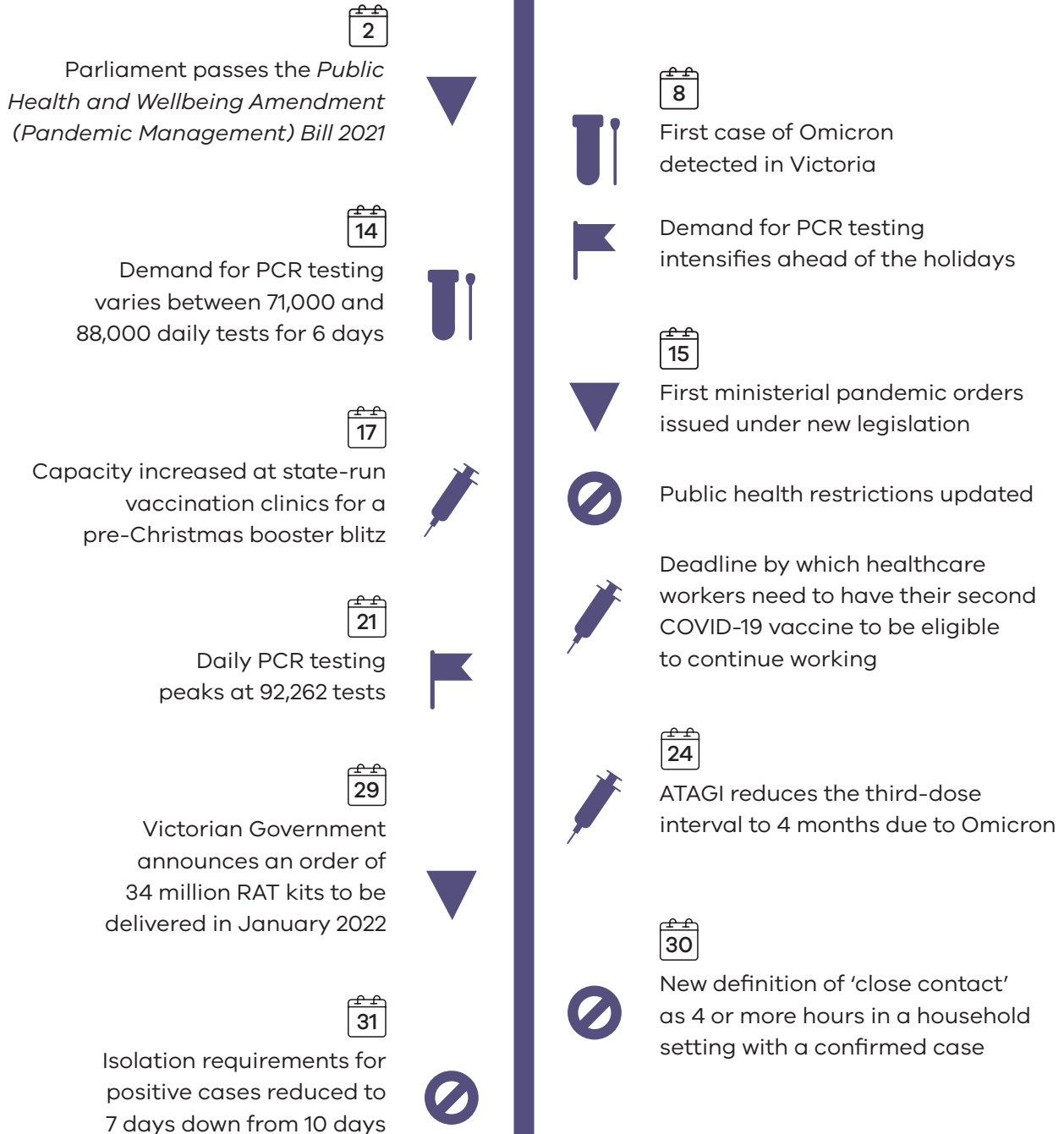


Department of Health



Victorian Government

December 2021



Key

Key point	Vaccination	Restrictions	Testing	Hotel quarantine	Department of Health	Victorian Government

Third wave: 12 July to 31 December 2021

Data and key points

The third wave started with the first case of the Delta variant in Victoria and nominally ended on 31 December 2021. Unlike previous waves, however, the ending of this wave did not see a fall in case numbers. Instead, the subsequent Omicron variant took hold in late December 2021 and accelerated further transmission in early 2022. The data and full impact of Omicron's activity from January 2022 will be covered in the 2022 and 2023 Chief Health Officer report.

The total number of COVID-19 cases reported in Victoria during this period was 198,652.

Epidemiological summary

This was Victoria's main epidemic wave in 2021, with large numbers of Victorians contracting the virus. This also coincided with a period of widespread COVID-19 vaccination. Following the introduction of COVID-19 vaccines, a lower proportion of people with COVID-19 were hospitalised or died from their infection than during the first and second waves.

Multiple separate spreads of the Delta variant into Victoria were epidemiologically and genomically linked to the Delta outbreak in New South Wales. From these, multiple outbreaks were seeded across Victoria and restrictions were imposed from 15 to 28 July 2021. However, case numbers stayed low and contact tracing efforts linked all cases during this period. After the restrictions were reduced, community cases continued to be reported in very low numbers, but all had identified sources.

On 4 August 2021 there were new local cases identified with unclear sources. On 5 August 2021 Victoria reintroduced strict restrictions as cases once again began to increase. While most cases could be rapidly linked to outbreaks, an increasing proportion could not be linked quickly or at all. From 17 August 2021 restrictions were further tightened with a curfew added. Community transmission continued to increase throughout September and October 2021.

Restrictions were proposed to ease under the Commonwealth Government's national plan, with stages in line with community vaccination coverage targets. By mid-October the epidemic trajectory turned around, and case numbers began to decrease.

The Omicron variant of concern was first detected in Botswana and South Africa in late November 2021 and was detected in a Victorian case in early December 2021. This variant was more transmissible than the Delta variant and took over as the predominant variant circulating in Victoria by the end of the year.

In late December 2021 cases once again began to increase and did so very significantly in the final days of the year.

Demographics

- The median age of COVID-19 cases in Victoria was 29 years – younger than the first 2 waves.
- 50.2% of cases were male.
- Infected people tended to live in areas of greater socioeconomic disadvantage, with 25% of cases living in the most disadvantaged areas of the state and 16.7% of cases in the least disadvantaged areas.
- 88% of cases lived in metropolitan Melbourne.
- 3.2% of cases (6,338 people) were healthcare workers, although this is likely an underestimate because case interviews were condensed and this information was not always collected.

Epidemiological characteristics

- Nearly all infections were locally acquired, with only 0.2% of reported infections acquired overseas.
- 55% of cases reported symptoms at testing.

Outcomes

- 7,822 cases were hospitalised (3.9% of all cases). The median age of hospitalised cases was 56 years.
- 1,094 cases were admitted to an intensive care unit, and 579 were ventilated.
- 952 COVID-19 deaths were reported (0.5% case fatality rate). The median age of cases who died was 80 years.

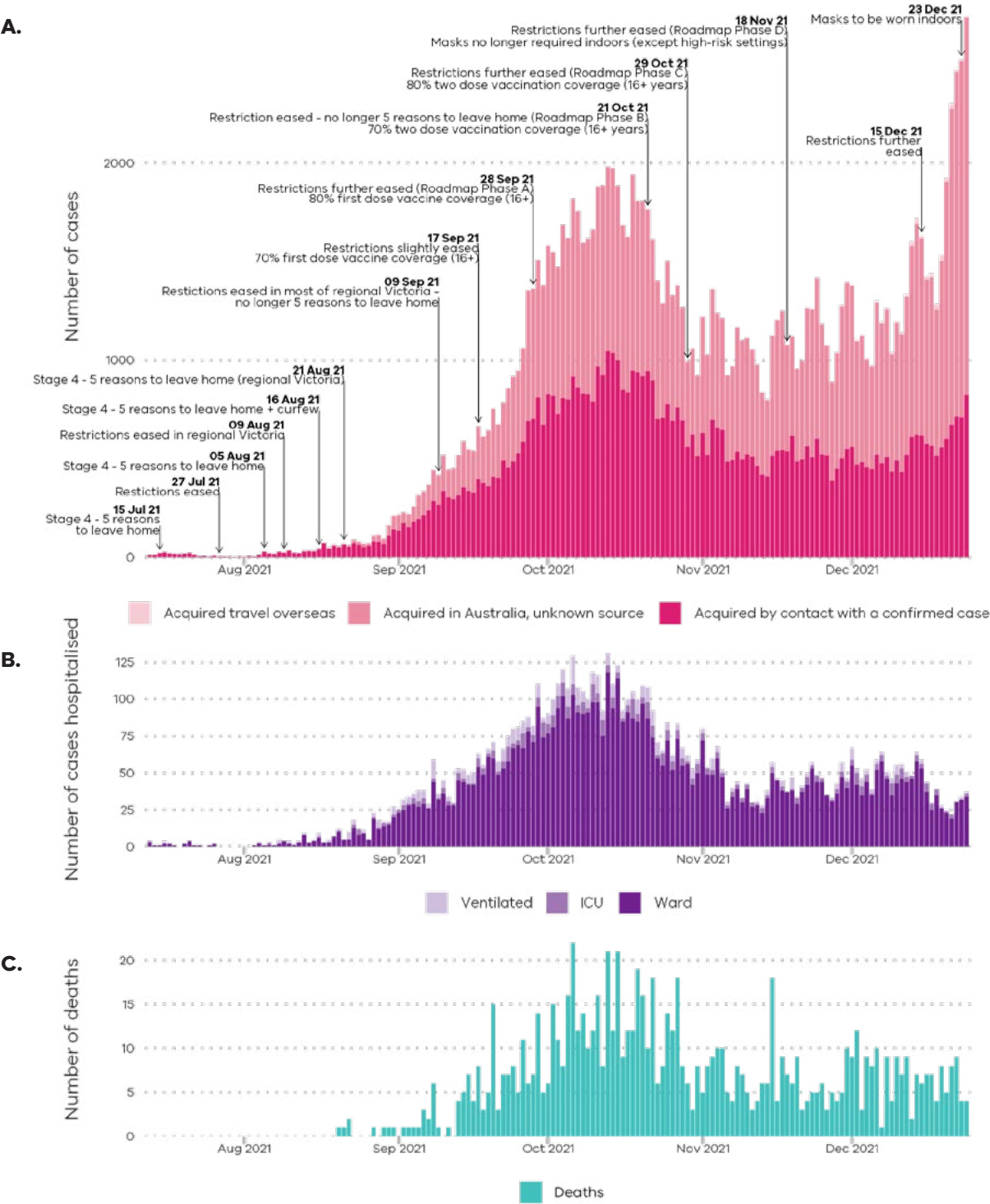
Testing

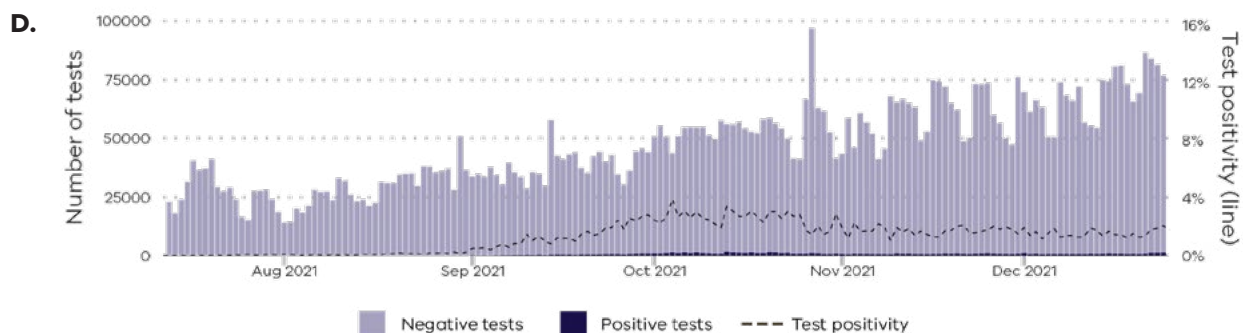
- More than 8 million PCR tests were processed in this phase (8,223,084 tests).

Aged care settings

- 0.6% of cases were aged care residents (1,244 people), which was less than the second wave.
- 23.5% of aged care resident cases were hospitalised (292 people).
- 20.6% of aged care resident cases died (256 people).
- 1,109 cases were staff in residential aged care settings (0.6% of total cases).

Figure 7: Third wave COVID-19 metrics in Victoria, 12 July - 25 December 2021: cases, hospitalisations, deaths and tests





- A.** Epidemic curve of daily new cases by onset date (or diagnosis date if asymptomatic) and key events in the pandemic.
- B.** Hospitalisation status of cases in hospital with COVID-19 (ward, ICU or ventilated) by onset date.
- C.** COVID-19 deaths by onset of disease.
- D.** PCR tests by date of test with daily test positivity rate.

Note: Case numbers increased dramatically in the final days of 2021; presented here are data to 25 December (inclusive).

Third wave – context

The third wave of COVID-19, which began in mid-July 2021, saw a significant increase in COVID-19 transmission across Victoria. While significant case numbers were recorded, the fact that this occurred as COVID-19 vaccinations were rolling out (but before introducing antiviral medications in 2022) meant that this wave had lower hospitalisation and case fatality rates than the first and second waves, as shown in Figure 8 and Table 10.

Figure 8: Percentage of COVID-19 cases hospitalised and deceased in the first wave (1 January to 25 May 2020), second wave (26 May to 27 November 2020) and third wave (12 July to 31 December 2021)

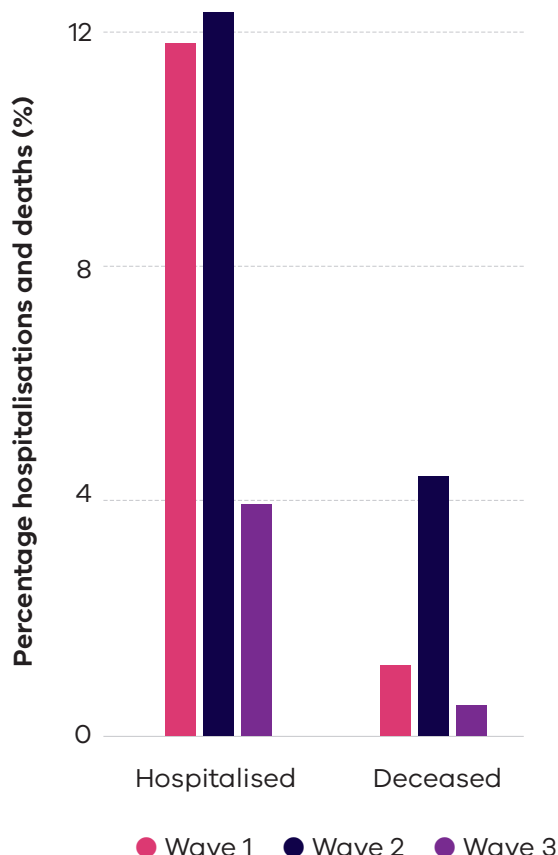


Table 10: Number of notified COVID-19 cases, related hospitalisations and deaths, by wave

Wave	Notified cases	Hospitalisations (%)	Deaths
1	1,642	194 (11.8%)	19 (1.2%)
2	18,698	2,305 (12.3%)	815 (4.4%)
3	198,652	7,822 (3.9%)	952 (0.5%)

As the COVID-19 vaccine program rolled out, a high proportion of Victorians got vaccinated. Vaccination became a critical component of managing the pandemic in Victoria and around the world. High vaccination rates supported a phased increase in community and business activity. This started as the ‘vaccinated economy trials’ and is discussed below.

Identifying the Delta variant of the COVID-19 virus triggered the third wave. Unlike previous waves where case numbers declined as the wave dissipated, the third wave saw the predominant variant of concern switch from Delta to Omicron in early December 2021. Omicron was markedly more transmissible than Delta and quickly predominated, causing a significant increase in case numbers in late December 2021.

Vaccinated economy trials

The change to government Directions to facilitate public health trials, known as 'vaccinated economy' trials, aimed to permit the controlled reopening of certain businesses and events in suitable local government areas of regional Victoria (Department of Health, 2021). These trials began in mid-October 2021. They represented cautious next steps that provided important opportunities to assess the impact of reopening and to apply these learnings to help plan and prepare for statewide easing of restrictions.

Stringent restrictions had been in place for repeated and prolonged periods in Victoria due to the ongoing active outbreaks. The vaccinated economy trials were the first easing of restrictions to be implemented on a large scale, as more Victorians were vaccinated for COVID-19 (Department of Health, 2021). The trials provided opportunities to track rates of community transmission and the impact of this transmission on the health system. The prospect of these trials and of reopening helped normalise vaccination as a requirement to return to activities in Victorian communities (Department of Health, 2021).

Regional local government areas with no or few cases of COVID-19, vaccination rates above the state average and those most likely to reach the 70% double dose vaccination target by the trial start date could take part in the trial (Figure 9). These criteria were chosen to mimic the ideal projected conditions to optimise trial success and reduce the risk of increased transmission of COVID-19 in those geographical areas.

These trials lead the way for significant reopening in late 2021 and early 2022 (Department of Health, 2021).

As the vaccinated economy progressed with greater numbers of Victorians becoming doubly vaccinated for COVID-19, and with the concurrent gradual easing of public health and social measures in late 2021, the nature of the national and state COVID-19 response evolved. While case numbers remained high (Figure 10), hospitalisation and case fatality rates reduced in line with increasing vaccination rates. The initial elimination then suppression strategy necessary to minimise the health impacts of the pandemic matured as the economy reopened.

Figure 9: Cases of COVID-19 per 100,000 population, Victoria, 12 July to 31 December 2021

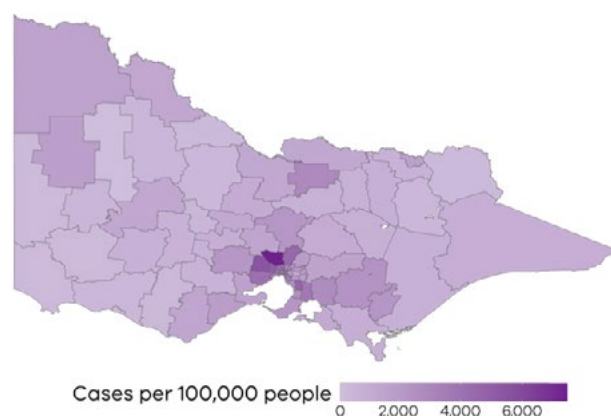
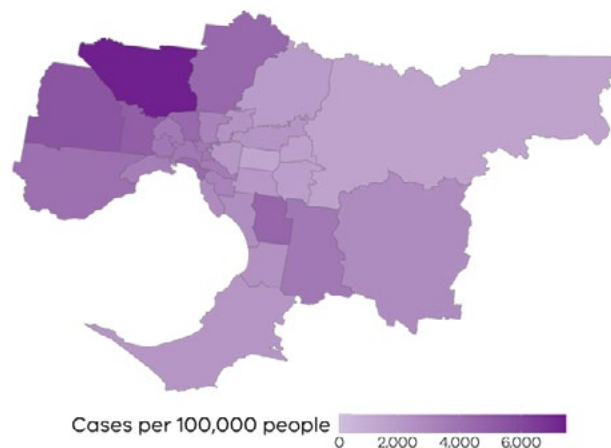


Figure 10: Cases of COVID-19 per 100,000 population, Greater Melbourne, 12 July to 31 December 2021



Rapid antigen testing

In October 2021, following the somewhat delayed approval from the Therapeutic Goods Administration (Commonwealth of Australia, 2024), Victoria announced it would buy 2.2 million rapid antigen tests (RATs) to increase testing capacity as part of the roadmap to reopening (Premier of Victoria, 2021a). The RATs were deployed in November 2021 to be used across the healthcare system in hospitals and community health services to support staff surveillance testing, manage close contacts and triage patients requiring urgent care. This included patients who presented to emergency and were awaiting the results of a PCR test (Premier of Victoria, 2021a). Any positive result required follow-up with a PCR test.

In mid-November the Premier announced that free RATs would also be made available to Victorian schools and early childhood centres for surveillance testing (Premier of Victoria, 2021b). In mid-December 2021 the Pandemic Order for Quarantine, Testing and Isolation included a presumptive case definition based on a positive RAT result.

In December 2021 the introduction of Omicron to the Victorian community and the escalation in testing demand required the RAT program to expand. By mid-December Victoria was submitting between 71,000 and 88,000 tests per day for a 6-day period, ballooning to more than 90,000 tests per day in late December due to a combination of demand from reopening, the spread of Omicron and travel testing requirements over the holiday season (Department of Health, 2022c). By 31 December 2021, 17,357,466 PCR tests had been performed in Victoria since 1 January 2020.

Amendments to the legislative framework


On 15 December 2021 the Victorian Government introduced a framework specific to pandemics in the *Public Health and Wellbeing Act 2008* – under Part 8A. While the updated framework was introduced in response to the COVID-19 pandemic, it aimed to also apply to future pandemics.

This legislation transferred significant powers to elected officials, with the intent of improved accountability and transparency including:

- setting clear objectives for pandemic management
- empowering the Premier to make a pandemic declaration
- empowering the health minister to make pandemic orders
- introducing an oversight mechanism via a Pandemic Declaration Accountability and Oversight Committee
- providing authorised officers with a range of pandemic management powers
- outlining specific provisions for detaining people to protect public health
- creating offences for failing to comply with a pandemic order, including by individuals, businesses or organisations
- empowering the Chief Health Officer and Secretary of the department to hold, collect, manage, use and disclose or transfer information reasonably necessary to exercise the powers under Part 8A
- providing safeguards for contact tracing information
- paving the way to set up an Independent Pandemic Management Advisory Committee to provide independent pandemic advice to government

- outlining the relationship between the State of Emergency and pandemic declarations
- setting up a pandemic order register to promote transparency
- requiring an independent review of the operation of Part 8A to begin no later than 18 months after the day on which Part 8A began.

The pandemic management framework enabled the Minister for Health to protect public health via creating pandemic orders in the event the Premier had declared a pandemic. The Premier can only declare a pandemic after considering the advice of the Chief Health Officer and the health minister and concluding the serious risk to public health resulting from a disease that is, or could have, pandemic potential. In turn, the Health Minister may only issue pandemic orders after seeking the advice of the Chief Health Officer and may consult others, as appropriate.



The declaration was extended 3 times on 12 January 2022, 12 April 2022 and 12 July 2022. The pandemic declaration and associated pandemic orders were retired on 12 October 2022.

Cross cutting issues

Three factors - age, sex and socioeconomic status - had significant impacts upon acquiring COVID-19 and the likelihood of hospitalisation and death. Separately, some individuals acquired COVID-19 infection in hospital, especially in 2020 before the introduction of COVID-19 vaccines and before significant improvements in our understanding of clinical care. These factors are discussed below.

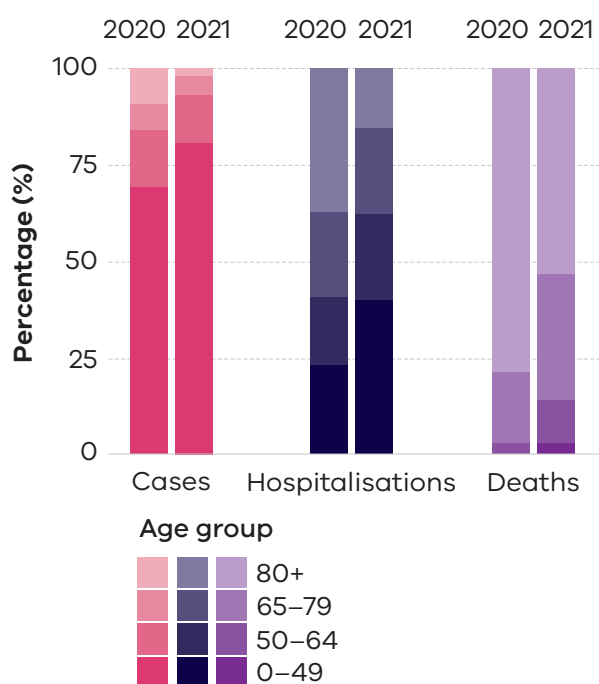
Age

A greater proportion of COVID-19-related hospitalisations and deaths occurred in older Victorians. More than 75% of deaths in 2020 were among those aged 80 years or older, and more than 50% were aged 80 years or older in 2021 (note that approximately 4.3% of the population was aged 80 or older in Victoria in 2021). Figure 11 shows the higher proportion of hospitalisations and deaths in older age groups, despite most cases being in younger age groups.



Figure 11 shows the higher proportion of hospitalisations and deaths in older age groups, despite most cases being in younger age groups.

Figure 11: COVID-19 cases, hospitalisations and deaths by age group at onset, 2020 and 2021



Sex

Differences in COVID-19 case numbers, hospitalisations and deaths between the sexes were observed in 2020 and 2021.

More cases, hospitalisations and deaths from COVID-19 occurred in females in 2020.

In 2021 there were similar numbers of hospitalisations in males and females, while there were more deaths in males: 58% of deaths were in males compared with 42% for females.

These differences between the sexes are summarised in Figure 12.

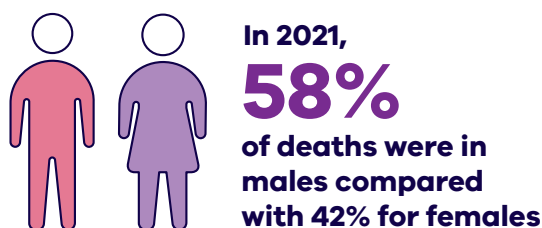
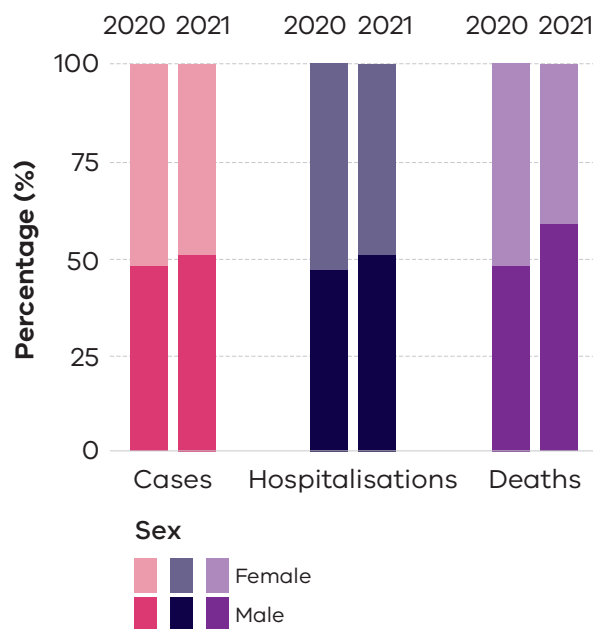


Figure 12: COVID-19 cases, hospitalisations and deaths by sex, 2020 and 2021



Note: For clarity, cases with sex other than male and female are not presented.

Socioeconomic status

To better visualise the impact of socioeconomic status on various COVID-19 metrics, the population can be split into 5 area-based quintiles based on place of residence. Under the quintiles, 1 represents people living in the most disadvantaged quintile and 5 represents people living in areas of the least disadvantaged. Approximately 20% of the Victorian population can be represented in each quintile.

If socioeconomic status had no relationship to COVID-19 health outcomes, the number of cases, hospitalisations and deaths would be the same in each quintile.

However, this is not observed. A greater proportion of cases, hospitalisations and deaths occurred in the most disadvantaged areas, and a smaller proportion occurred in areas of least disadvantage (Figure 13).



A greater proportion of cases, hospitalisations and deaths occurred in the most disadvantaged areas. A smaller proportion occurred in least disadvantaged areas.

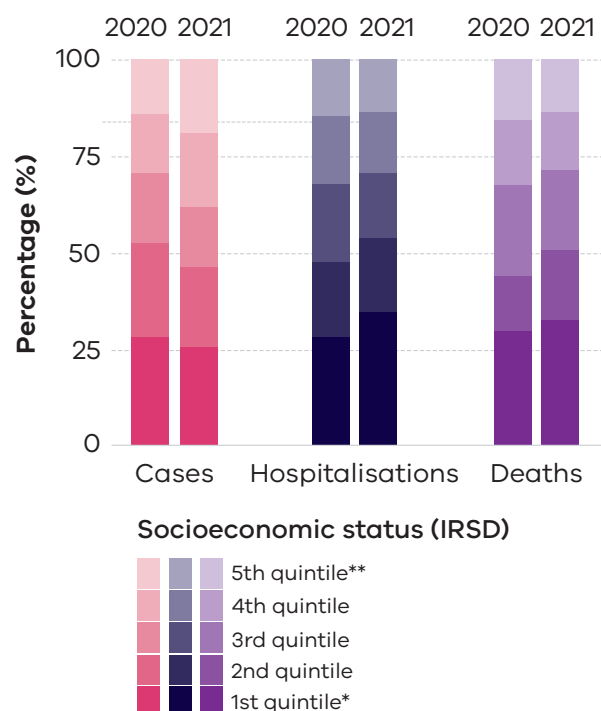
Socioeconomic status has been associated with a range of factors including:

- unequal exposure and transmission risk
- differing clinical risks and comorbidities
- lower vaccine uptake in lower socioeconomic status areas.



This association reflects the social determinants of health, discussed more in the 'Health inequalities' chapter.

Figure 13: COVID-19 cases, hospitalisations and deaths by socioeconomic status (Index of Relative Socioeconomic Disadvantage; IRSD quintiles), 2020 and 2021



*Most disadvantaged **Least disadvantaged

Note: For clarity, cases with missing socioeconomic data (postcode) are not presented.

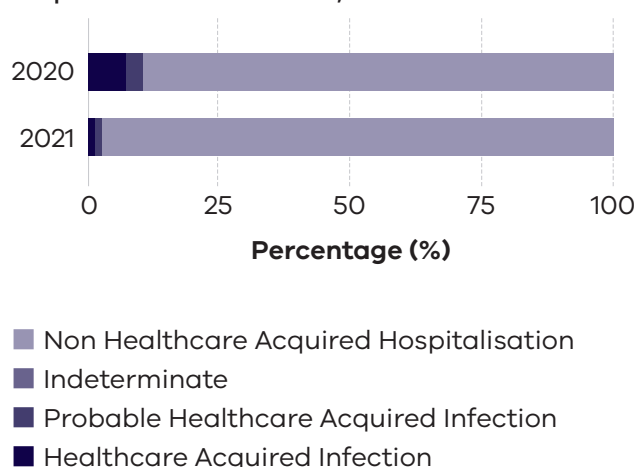
Hospital-acquired infections

Hospital-acquired infections (also known as healthcare-acquired or healthcare-associated infections, or HAIs) are infections that are acquired in hospital.

Patients contracting COVID-19 while in hospital was described in many countries during the pandemic.

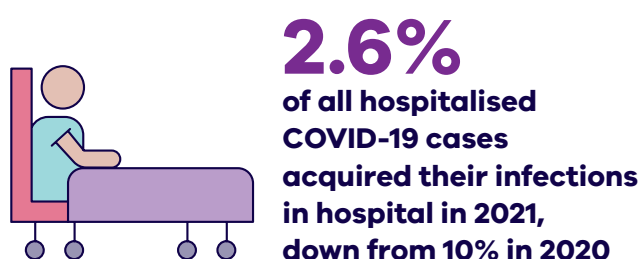
In Victoria, COVID-19 cases were categorised as having either definite, probable, indeterminate or non-healthcare-acquired COVID-19 infection according to predefined criteria. The categorisation of HAIs is shown in Figure 14. Hospital infection prevention and control staff validated HAI status for all cases.

Figure 14: Percentage of COVID-19 hospitalisations according to hospital-acquired infection status, 2020 and 2021



There were 251 COVID-19 HAIs in 2020 and 208 COVID-19 HAIs in 2021.

Approximately 10% of all hospitalised COVID-19 cases acquired their infection in hospital in 2020. This reduced to 2.6% of all hospitalised COVID-19 cases in 2021.



HAI occurred in patients who were older on average than hospitalised patients with community-acquired COVID-19. The median age of HAIs in 2020 was 82 years compared with a median age of 70 for community-acquired hospitalised patients. Similarly in 2021, the median age of HAIs was 79 years and for community-acquired infections in hospitalised patients the median age was 55.

HAI patients had lower rates of intensive care unit admission or ventilation requirements than non-HAI patients.

Risk of death was greater in HAI patients compared with non-HAI patients (35% compared with 10% in 2020 and 23% compared with 8.4% in 2021).

Health service impacts

Because COVID-19 was a novel disease in early 2020, this presented many challenges for hospital care. There was also limited information available on how to reorient entire health systems, economies and societies around its control (Department of Health and Human Services, 2020d).

Having seen the exponential growth of cases and rationing of health services overseas, Victoria's health system undertook detailed capital planning work including planning for up to 4,000 emergency beds and a contingent intensive care unit at the Melbourne Convention Centre (COVID-19 Hotel Quarantine Inquiry, 2020a). Ultimately this capacity was not required during the course of the pandemic.

COVID pandemic plan

The *COVID-19 pandemic plan for the Victorian health sector* was delivered on 10 March 2020, in the very early stages of the global pandemic. It outlined Victoria's approach to identify and mitigate the social and economic impacts and consequences of a COVID-19 pandemic on Victorian communities.

The plan was based on a partnership approach, with Victoria collaborating with all states, territories and the Commonwealth. It included 4 stages – initial containment, targeted action, peak action and stand-down and recovery. Planning and strategy had to shift to meet challenges at various stages of the response (Department of Health and Human Services, 2020d).

COVID-19 health system preparedness and response

The Victorian Government worked closely with public and private hospitals from March 2020 to deliver system-wide responses. During the early phases of the pandemic, the government focused on preparing the health system to maintain its capacity to provide healthcare to Victorians.

Key activities included:

- allocating \$1.9 billion for a staged response to expand capacity across Victoria to meet COVID-19 demand, purchase ventilators and personal protective equipment, as well as to train the healthcare workforce
- establishing agreements between public and private hospitals to operate as one system to respond to the pandemic and to access vacant private hospital beds (Public Accounts and Estimates Committee, 2021)
- providing significant extra funding of \$2.9 billion for the 2020–21 COVID-19 health response in the State Budget to support hospital performance, Ambulance Victoria and public health command and response (Department of Health and Human Services, 2020e).

The department also worked with health services, Safer Care Victoria and the Victorian Health Building Authority with plans in place for patients to be treated under COVID normal conditions, especially where there were increased case numbers (Department of Health, 2023a).

Intensive care beds and ventilators

Epidemiological data and modelling guided the plan to increase intensive care and critical care capacity. Public health experts reviewed this plan. Plans were in place to ensure nearly 4,000 intensive care beds were made available, allowing health services to match capacity to demand (Department of Health and Human Services, 2020f). Ultimately this capacity was not required during the course of the pandemic.

Victoria's purchase of ventilators was based on the original modelling undertaken in March 2020. Based on the experiences from Western Europe at that time, that earlier modelling predicted almost 70% of COVID-positive patients would need ventilation. Ventilators were also provided to Ambulance Victoria to ensure the rapid and safe transfer of patients between health services (Department of Health and Human Services, 2020f).

Ambulance and emergency care

In 2020–21 Ambulance Victoria implemented strict safety measures to protect its staff and the public from exposure to COVID-19 and to ensure workforce availability during periods of virus-related peaks in demand for ambulance services. To supplement capacity, Ambulance Victoria contracted extra licensed non-emergency patient transport providers, particularly for transporting aged care residents, both COVID-positive and COVID-negative, to hospitals (Department of Health, 2021).

Role of health services in aged care

The response to the pandemic and subsequent outbreaks in residential aged care services in Victoria was supported by Victoria's health services system, across both public and private hospitals. Victoria's health services provided practical support to these facilities through staffing, advice, clinical support and leadership, and by providing beds for residents who could no longer be cared for safely in these facilities (Department of Health and Human Services, 2020g).



The role of health services in aged care is discussed later in this chapter in the 'Residential aged care' section.

Planned surgery

Elective surgery activity levels were adjusted throughout the pandemic to respond to prevailing conditions. This included periods when health services suspended elective surgery during times of peak COVID-19 transmission in the community, to ensure that there were sufficient hospital beds for patients with COVID-19. After these suspensions elective surgery activity was allowed to increase in a staged manner, aligning with Victoria's Coronavirus roadmap for reopening (Department of Health and Human Services, 2020h, 2020i).

Workforce

As of 1 July 2021, there were 3,760 staff working on the COVID-19 response. This included staff working on:

- the state's vaccine program
 - case, contact and outbreak management
 - infection prevention and control
 - intelligence and data modelling
 - compliance and enforcement
 - public health advice
 - epidemiology, testing and pathology
 - community engagement
 - contact centre handling
- (Department of Health, 2023a).

During July and August 2020, as Melbourne's second wave took hold, more than 1,000 staff across the health system were on leave each day due to testing positive to COVID-19 or being a close contact of a COVID-19 patient. Health services experienced significant staff leave impacts for the rest of the year and in 2021. To address this, the department received assistance from Ambulance Victoria and the Australian Defence Force and engaged staff from HealthDirect Australia (Department of Health, 2021).

In response to significant and ongoing clinical staffing gaps, the government introduced flexible workplace arrangements. Workforce surge models adopted a skills-based approach ensuring all patients received appropriate care from practitioners operating at the top of their scope of practice, under the supervision of critical care trained staff. This ensured appropriate professional support where required (Department of Health, 2023a).

Protecting healthcare workers

The Healthcare Worker Infection Prevention and Wellbeing Taskforce was set up in early August 2020 to:

- provide expert advice on strategies and processes to reduce work fatigue among healthcare workers
- limit occupation-acquired healthcare worker infections
- improve healthcare worker morale and wellbeing.

The release of the *Protecting our healthcare workers action plan* followed. Actions to keep workers safe included:

- audits of COVIDSafe plans
- staff amenities and physical distancing requirements
- asymptomatic testing
- guidance on using personal protective equipment correctly for infection control.

Improvements to heating, ventilation and air-conditioning systems and use of zones to control patient density also contributed to keeping health care workers safe (Department of Health and Human Services, 2020d).

On 19 September 2021 the government announced *Victoria's roadmap: delivering the national plan*, the state's strategy for implementing the transition phases of the national plan. Vaccination mandates were an important part of this approach.

Vaccination mandates were introduced through the Chief Health Officer Directions during a period of restrictions for metropolitan Melbourne (ending 22 October 2021) and regional Victoria (ending 9 September 2021 for most regional areas).

Initially, these mandates were introduced for workers in specific high-risk workplaces throughout September 2021; first in residential aged care facilities, followed by construction, and then healthcare and education facilities (Department of Health, 2023b).

Hospital in the Home and telehealth

The Hospital in the Home (HITH) program saw an early boost in patient load as hospitals discharged patients to be cared for at home. This was to both keep them safe and free up beds for COVID-19-positive patients. In Victoria, some health services reported rapidly scaled-up HITH to maximise bed capacity for anticipated COVID-19 patients. This included offering HITH to patient cohorts for whom HITH was not previously common, engaging clinicians who were not previously HITH users, and establishing new clinical practices and service models.

Face-to-face service was delivered throughout periods of strict restrictions, with telehealth providing a valuable adjunct to HITH service delivery. The ability to use telehealth to complement face-to-face service allowed more patients to safely receive both admitted and non-admitted services that met their needs while protecting staff (Centre for Evaluation and Research Evidence, 2020).

Due to COVID-19 physical distancing restrictions, pregnancy care and postnatal home-based care shifted from face-to-face care to telehealth delivery across maternity hospitals (Department of Health and Human Services, 2020a). The platform was extended to community health and mental health organisations, alcohol and other drug services as well as other organisations, including Ambulance Victoria, Dental Health Services Victoria and Forensicare (Department of Health and Human Services, 2020j).

COVID-positive community pathways

In 2020–21 the department, Safer Care Victoria, public health services, community health services, primary health networks and GPs worked together to implement the COVID-19 Positive Care Pathways program. This initiative aimed to provide comprehensive care for all Victorians diagnosed with COVID-19. Through a clinical risk and severity assessment and tailored monitoring, enrolled patients received a combination of home-based care (via telehealth and remote monitoring) with access to specialist inpatient care if needed.

Those at risk of deteriorating were identified early and supported with higher levels of care. This reduced the risk of exposure to COVID-19 among community members, patients and healthcare workers (Department of Health, 2021).

The pathways included services delivered via telehealth, enabling clinical and social needs assessments and appropriate levels of care. Care was tailored to the needs of patients, including stable and asymptomatic cases, unstable and deteriorating patients, and comorbid patients (Department of Health and Human Services, 2020k).

Mental health impacts

The pandemic had a major impact on the way Victorians live. From March 2020, widespread restrictions on movement, physical distancing measures and business restrictions were implemented to reduce the spread of infection, hospitalisations and deaths.

Many Victorians experienced psychological distress during the year, and for some people with an existing mental illness, distress and isolation exacerbated their existing health concerns. Stress, confusion and anger are commonly reported outcomes of the pandemic and the restrictions necessary to prevent its spread.

The proportion of adults who experienced high or very high levels of psychological distress significantly increased from 18.1% in 2019 to 23.4% in 2020. This was significantly higher in younger age groups – 35.0% of adults aged 18 to 24 years and 27.8% of adults aged 25 to 34 years (VAHI, 2022).

A significantly higher proportion of adults who lived in rural Victoria (30.7%) in 2020 reported very high levels of satisfaction with life compared with adults who lived in metropolitan areas (25.5%) (VAHI, 2022).



The mental health and wellbeing of Victorians is discussed more in the 'Mental health' chapter.

Health and education impacts on children

Physical and mental health of school-aged children was a major focus of public health responses during 2020, with governments trying to balance developmental needs with controlling case numbers. Most students had mixed experiences of remote learning: 78% of students who responded to a survey said their lives had been positively affected by COVID-19 to some degree, while 89% said their lives had been negatively affected to some degree (Department of Education, 2020).



The mental health and wellbeing of children is discussed more in the 'Child health' and 'Mental health' chapters.

Excess mortality

Excess mortality measures were used to understand the full impact of the COVID-19 pandemic on mortality (death rates). Excess mortality is defined as the difference between the total number of deaths from all causes in a specified period and the expected numbers of deaths from all causes in that same period (ABS, 2023). Excess mortality measures can be used to infer the number of extra deaths due to COVID-19, potentially misclassified or undiagnosed COVID-19 deaths, and other mortality that may be indirectly related to the pandemic (for example, relating to social isolation or changed access to health care). For these reasons, excess mortality is generally considered a more comprehensive measure for assessing the impact of the pandemic rather than considering only the number of deaths due to COVID-19 (ABS, 2023).

Table 11 shows excess mortality for Australia and each state and territory in 2020 and 2021 expressed as the percentage above expected mortality for that year. Negative values indicate that mortality was lower than expected – that is, there were fewer deaths than expected.

Table 11: Excess mortality rate (%) for each state and territory due to COVID-19, 2020 and 2021

Jurisdiction	2020	2021
New South Wales	-4.1	0.3
Victoria	-0.9	3.7
Queensland	-4.3	1.0
South Australia	-3.1	0.5
Western Australia	-3.9	0.9
Tasmania	-3.6	5.6
Northern Territory	1.6	6.6
Australian Capital Territory	-4.3	-4.0
Australia	-3.1	1.6

In 2020 all states and territories except the Northern Territory experienced significantly fewer deaths than expected. These fewer deaths provide insights into the impacts of public health and social measures in 2020; that is, the public health directions of the time actually reduced mortality because people were less able to take part in activities that have an increased risk of injury and mortality. For example, one possible explanation could be that the public health directions restricted travel so fewer people were at risk of travel-related injuries and death.

In 2021, however, all states and territories except the Australian Capital Territory experienced excess mortality, with Victoria experiencing 3.7% more deaths than expected (ABS, 2023).

Residential aged care

The Commonwealth Government is the primary funder and regulator of residential aged care services in Australia, including the 179 public residential aged care facilities that were operated by the Victorian Government's public health services in 2021 (Royal Commission into Aged Care Quality and Safety, 2020). In 2020 Victoria had 766 residential aged care facilities, hosting 48,824 permanent residents, while in 2021 Victoria had 758 residential aged care facilities, hosting 47,495 permanent residents (AIHW, 2020b; AIHW, 2021b). Of all residential aged care facilities in 2020, 178 were public residential aged care facilities.

Although the Commonwealth Government's Aged Care Quality and Safety Commission regulates residential aged care facilities, in the context of the pandemic, the Victorian Chief Health Officer's directions applied to all Victorian residential aged care settings (as well as many other sensitive settings) to protect public health.

COVID-19 in residential aged care – summary

Table 12 summarises the number of COVID-19 cases, related hospitalisations and deaths in residential aged care by wave.

Table 12: COVID-19 cases, related hospitalisations and deaths in residential aged care by wave

Wave	Cases	Hospitalisations	Deaths
First	4	1	0
Second	1,961	899	657
Interwave	4	3	0
Third	1,244	292	256
Total	3,213	1,195	913

Note: The number of reported deaths and hospitalisations were correct at the time of publication but this data can change as reclassification can occur.

First wave (25 January 2020 – 25 May 2020)

The first wave of the COVID-19 pandemic started on 25 January 2020 and concluded on 25 May 2020. During this period cases of COVID-19 were mainly from returned overseas travellers, cruise ship participants and people who attended large social gatherings such as weddings. During this period there were 4 cases and 1 hospitalisation due to COVID-19 amongst aged care residents. There were no deaths reported in aged care.

Second wave (26 May 2020 – 27 November 2020)

The second wave of the COVID-19 pandemic started on 26 May 2020 and concluded on 27 November 2020. There were no active cases of COVID-19 in residential aged care before 7 July 2020, but by 13 July, there were 28 cases. By 9 August this figure exceeded 1,000. The first recorded death of a residential aged care resident from COVID-19 in Victoria occurred on 11 July 2020 (Royal Commission into Aged Care Quality and Safety, 2020). By the end of this wave there had been 1,961 cases in residential aged care, 899 resulting in hospitalisation and 657 resulting in death. During this period there were outbreaks in 178 residential aged care facilities.

Interwave phase (28 November 2020 – 11 July 2021)

Following the second wave of 2020, local elimination was achieved (27 November 2020) and the rest of 2020 and the first half of 2021 was a period of low case numbers, with a handful of outbreaks that were successfully contained. During this interim period, there were 4 cases of COVID-19 in aged care residents, 3 of which required hospitalisation. No residents died due to COVID-19 during this period.

Third wave (12 July 2021 – 31 December 2021)

The third wave of the COVID-19 pandemic started on 12 July 2021 and nominally concluded on 31 December 2021. During this period there were 1,244 cases of COVID-19 in residential aged care residents, with 292 cases resulting in hospitalisation. In all, 256 residential aged care residents in this period died due to complications with COVID-19. During this period the Commonwealth and Victorian governments began their COVID-19 vaccine rollout.

Measures taken to keep residents safe

From early in the pandemic, the risk of COVID-19 for older Victorians, especially those living in residential aged care, was clear (Department of Health, 2021). Steps taken to prioritise the safety of older Victorians during the first wave included infection prevention and control training for residential aged care staff and implementing visitor restrictions to hospitals and residential aged care facilities.

During the second wave of the COVID-19 pandemic, Victoria experienced outbreaks across 178 different residential aged care facilities. On 27 July 2020, in response to these outbreaks, the Victorian Aged Care Response Centre (VACRC) was established. VACRC was a collaboration between the Commonwealth Government and the Victorian Government. VACRC implemented a series of activities designed to provide emergency coordination and support to the local response that had been stretched by the volume and extent of COVID-19 outbreaks in residential aged care facilities (Department of Health, 2021).

VACRC's priorities during the COVID-19 pandemic included (Department of Health, 2021):

- preparing residential aged care staff in pandemic and outbreak management
- sourcing extra staff for facilities in the event of an outbreak
- providing facilities with personal protective equipment
- providing facilities with COVID-19 testing equipment
- supporting facilities with COVID-19 vaccine rollouts.

During the peak outbreak periods, visitor and movement restrictions were implemented in residential aged care settings to protect residents and staff. These restrictions limited and sometimes prevented residents from being able to interact with friends and family and had impacts on the mental health and wellbeing of both residents and their loved ones (Aged Care Special Report, 2020; Victorian Government, 2021).



The COVID-19 public health directions are discussed more in the 'First wave – COVID-19 public health response' section.

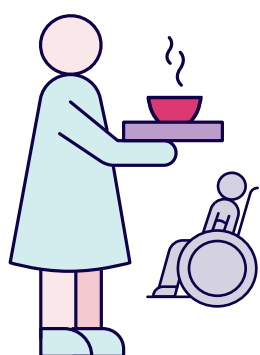
Royal Commission into Aged Care Quality and Safety

On 1 March 2021 the Royal Commission into Aged Care Quality and Safety released the Aged Care and COVID-19 special report. This report proposed 6 recommendations to help improve Australia's residential aged care system (Department of Health, 2021). The Victorian Government welcomed these recommendations and has advocated for there to be strong engagement with states and territories to implement them (Department of Health, 2021).

Go online to [review the findings of the commission and the recommendations](https://www.royalcommission.gov.au/system/files/2021-03/aged-care-and-covid-19-a-special-report.pdf) <<https://www.royalcommission.gov.au/system/files/2021-03/aged-care-and-covid-19-a-special-report.pdf>>.

Preventing infections by protecting our healthcare workers

Due to notifications of COVID-19 appearing in residential aged care facilities, the department identified that infection control practices were an area of concern. To protect residential aged care residents, specialised infection control training was prioritised and provided to all residential aged care staff. During 2020 and 2021, more than 23,700 health and aged care workers were trained in the correct use of personal protective equipment, infection control and hand hygiene (Department of Health, 2021). The PPE Taskforce, which was established in early April 2020, helped to reinforce supply chains to ensure Victorian healthcare workers had ongoing access to these personal protective equipment supplies (Department of Health, 2021).



**More than
23,700**
health and aged
care workers were
trained in the correct
use of personal
protective equipment,
infection control
and hand hygiene



The protective measures put in place to protect healthcare workers during the pandemic are discussed more in the 'Third wave – Health service impacts' section.

Vaccine blitz for the aged and disability care sectors

On 22 February 2021 phase 1a of the Commonwealth Government's vaccine rollout began. Phase 1a focused on protecting quarantine and border workers, frontline health workers and residential aged care and disability residents and staff. During this phase the Commonwealth Government began its aged care and disability vaccine rollout, with 218,266 doses of vaccine delivered to Victorian private and not-for-profit aged care and disability residents in 2021 (Department of Health and Aged Care, 2021). At the same time the Victorian Government provided over 4,300 public residential aged care residents with the 2 doses of vaccine needed to be classified as fully vaccinated at the time (Premier of Victoria, 2021c).



218,266
vaccine doses
delivered to Victorian
private and not-for-
profit aged care and
disability residents
in 2021



The COVID-19 vaccination rates are discussed more in the 'Interwave phase – Victoria's COVID-19 vaccination program' section.

Mental health impacts on residential aged care residents

The visitor and movement restrictions that were implemented during the peak outbreak periods were implemented to protect residents and staff from contracting the virus. These restrictions, which occurred in other states and territories as well as Victoria, limited and sometimes prevented residents from interacting with their loved ones. This loss of interaction affected the mental health and wellbeing of both residents and their loved ones (Royal Commission into Aged Care Quality and Safety, 2020).

Since March 2020, there was an increase in the levels of depression, anxiety, confusion, loneliness, and suicide risk observed among residential aged care residents nationwide (Royal Commission into Aged Care Quality and Safety, 2020). Some of this increase can be attributed to residents missing family, struggling with changed routines, having concerns about catching the virus and/or being afraid of being isolated in their rooms (Royal Commission into Aged Care Quality and Safety, 2020).

During this period technology and internet access were essential for allowing residents to maintain contact with friends and family, and to attend medical appointments. While the use of technology helped improve residents' mental health it was not a substitute for physical contact, which some residents craved (Hack et al. 2022). The effectiveness of technology was also limited by residents' auditory, visual and/or cognitive impairments (Hack et al. 2022; Royal Commission into Aged Care Quality and Safety, 2020).

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Health inequalities

Health inequalities and inequities

Health and ill-health are caused by a range of factors. To help understand health, we need to consider health inequalities, health inequities and the determinants of health, including the social determinants of health.

According to VicHealth (2014):

Term	Definition
Health inequalities	are differences in health status between population groups. Example: health differences between young people and older people
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. Example: health differences between a person who is homeless and a person with secure and safe housing

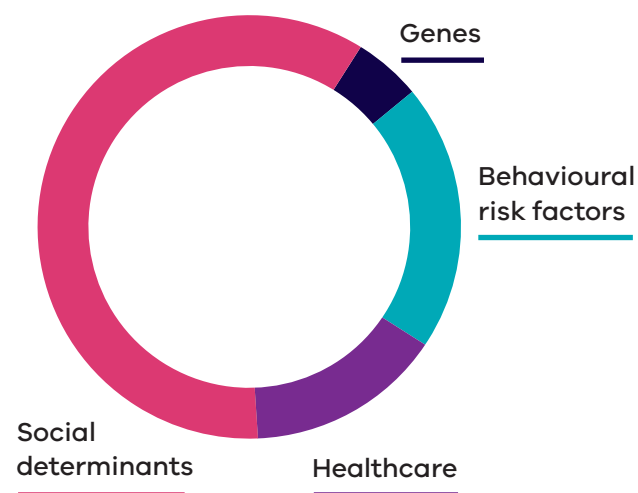
According to the World Health Organization (WHO), health inequities are *avoidable* inequalities in health that affect groups of people within and between countries (WHO, 2013). These factors that influence health inequities and inequalities are known as the determinants of health.

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 health care, and the social determinants of health (Tarlov, 1999).

Figure 15 shows the relative contribution of these determinants to health according to Tarlov (1999).

Figure 15: Determinants of health



Adapted from Tarlov, 1999

While our genetic makeup, health behaviours and access to health care all have an impact on our health, they are outweighed by the impact of socioeconomic factors. These are the material, social, political and cultural conditions that shape our lives and our behaviours (AIHW, 2017).

Social determinants of health

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'. The forces and systems that they mention include the distribution of money, power and resources (WHO, 2024).

Social determinants include but are not limited to (WHO, 2024):

- income and social protection
- education
- unemployment and job insecurity
- working life conditions
- food insecurity
- housing, basic amenities and the environment
- early childhood development
- social inclusion and non-discrimination
- structural conflict
- access to affordable health services of decent quality.

The socioeconomic gradient, also called the social gradient, describes the phenomenon where people who are at a social or economic disadvantage are at a greater risk of poor health, disability and/or death. For every step a person takes up the socioeconomic ladder, the better their health becomes. A person's income, occupation and highest level of education are the 3 determinants used to measure socioeconomic position. Widening inequalities in these determinants are often used to explain the widening health inequalities (AIHW, 2016; Flavel et al., 2022; WHO, 2013).

Wellbeing is not just the absence of disease or illness but is a complex combination of a person's physical, mental, emotional and social health. In the public health survey conducted by the Victorian Agency for Health Information, wellbeing is measured by levels of psychological distress, life satisfaction and self-reported health status. Low wellbeing is an important primary and/or secondary risk factor for several diseases and conditions including but not limited to fatigue, migraine, cardiovascular disease, chronic obstructive pulmonary disease, obesity, depression and anxiety (VAHI, 2022).

According to the agency, in 2020 people who reported low or very low levels of wellbeing were more likely to:

- be widowed, divorced or separated
- have experienced racism in the preceding year
- have experienced food insecurity in the preceding year
- have high blood cholesterol and/or high blood pressure
- have 2 or more chronic diseases
- rate their health as poor
- be a smoker
- have low or no civic and social trust
- have low or no social support
- be intolerant of diversity
- have a low level of education
- be financially stressed
- be unemployed or not in the labour force
- live in rented housing
- have a total annual income of less than \$60,000.

COVID-19 and the social determinants of health

While the COVID-19 pandemic affected the lives of all Victorians, some felt its effects more than others. In Australia there were almost 4 times as many deaths due to COVID-19 for people in the lowest socioeconomic group than there was for those in the highest socioeconomic group (AIHW, 2021). WHO (2021) found that older people, men, people with chronic non-communicable diseases and people with disabilities appeared to be at higher risk for developing complications due to COVID-19. It also found that people with low income, marginalised ethnic groups, migrants, incarcerated people, homeless people and people who were affected by emergencies (including conflict) were at a higher risk of COVID-19 mortality (WHO, 2021).

Homeless families were at a higher risk of viral transmission due to crowded living spaces in shelters as well as scarce access to COVID-19 testing kits/facilities (Abrams and Szeffler, 2020; Truong and Allen, 2020). The Victorian Government helped more than 2,000 homeless Victorians into accommodation in vacant hotels. The government then implemented the From Homelessness to a Home package to help these Victorians access stable, long-term housing (Premier of Victoria, 2020c).

Culturally and linguistically diverse communities reported difficulties finding, accessing and understanding health-related information. Due to this they were more vulnerable to misleading rumours and information about COVID-19 (Truong and Allen, 2020). To address this, the department instigated community engagement and targeted outreach activities with culturally and linguistically diverse communities.

It also translated COVID-19 fact sheets into 57 different languages, while SBS translated its COVID-19 news and information into 63 different languages (Victorian Multicultural Commission, 2021).

The impacts of the pandemic disproportionately affected women. Women experienced greater job losses than men, reflecting their higher rates of employment in insecure, informal and lower paying jobs. High rates of employment in frontline services heightened the risk of infection for women, and there were increases in domestic violence over the course of the COVID-19 pandemic (Paremoer et al., 2021; Truong and Allen, 2020). In response to the increase in domestic violence cases, the government provided short-term accommodation for victim survivors who did not feel safe isolating or recovering from COVID-19 at home (Victorian Government, 2022).



The impact of the pandemic on domestic violence is discussed more in the 'COVID-19 pandemic' chapter.

People employed in non-essential casual/temporary positions were disadvantaged due to restrictions as businesses reduced staff or staff could not work, resulting in loss of income (Paremoer et al., 2021). People employed in essential casual/temporary positions were also disadvantaged because these workers did not have access to sick leave, resulting in hesitancy to test and quarantine for fear of income loss (Paremoer et al., 2021). In 2020 Australia's unemployment rate increased from 5.1% in February to a peak of 7.5% in July. In April 2020 it was recorded that 20% of Australia's labour force were either unemployed or underemployed (AIHW, 2021).

In Victoria a Testing Isolation Payment and Sick Pay Guarantee program were introduced for casual workers (Business Victoria, 2022; Victorian Government, 2024). The Testing Isolation Payment provided a \$450 payment to financially support casual workers who had to self-isolate after a COVID-19 test and stay in isolation while waiting for the result (Business Victoria, 2022). The Sick Pay Guarantee program provided casual and contract workers up to 38 hours a year of sick and carer's pay (Victorian Government, 2024).

Climate change and the social determinants of health

Climate change has altered global weather patterns, resulting in rising sea levels, longer and more frequent heat waves, and more intense flooding and droughts. These changes are collectively increasing the number of climate-related injuries, illnesses and deaths (Ebi and Hess, 2020; WHO, 2023).

The risks of climate change include:

- extreme events (heatwaves, storms, floods, bushfires)
- infectious diseases (including food-, water- and vector-borne illnesses)
- food and water insecurity.

These events can worsen existing inequalities by increasing priority groups' exposure and vulnerability to climate risks, as well as their disproportionate loss of assets and incomes (Ebi and Hess, 2020; WHO, 2023). Those most impacted include women, children, ethnic minorities, poor communities, migrants or displaced people, older populations, and those with underlying health conditions (WHO, 2023).

Aboriginal Victorians

Acknowledging the resilience of Aboriginal Victorians

The health emergency events across 2020–2021 affected all communities in Victoria, including Aboriginal people living in the state. During the response to the 2019–20 bushfires and the early years of the COVID-19 pandemic, Aboriginal people and Aboriginal Community Controlled Organisations continued to remain resilient to support the health and wellbeing of communities.

The department acknowledges the leadership role of the Victorian Aboriginal Community Controlled Health Organisation and leaders of Aboriginal Community Controlled Organisations in leading, designing and implementing the COVID-19 response. The collaborative partnership between the department and the Aboriginal community-controlled health sector was forged on the strength of Aboriginal communities, enabling a culturally safe response to COVID-19.

Enabling action towards self-determined health and wellbeing priorities

Self-determination is essential to improving Aboriginal health and wellbeing outcomes (O'Mara, 2012). In 2020, before machinery-of-government changes, the then-Department of Health and Human Services' guiding Aboriginal health and wellbeing policy was outlined in the *Korin Korin Balit-Djak* plan and its implementation was supported through the Aboriginal Strategic Governance Forum.

Since setting up a separate Department of Health in 2021, the first Aboriginal Health and Wellbeing Partnership Forum (AHWPF) was convened to formalise a partnership between the Victorian Government and Victoria's Aboriginal Community Controlled Organisations.

Co-chaired by the Chair of the Victorian Aboriginal Community Controlled Health Organisation and the Minister for Health, the AHWPF in April 2021 was the first state-led initiative to enable mainstream health services, government and Aboriginal Community Controlled Organisations to meet.

The AHWPF is the lead decision-making body for Aboriginal health and wellbeing in Victoria. During this first AHWPF, members agreed on statewide Aboriginal health priorities and next steps to develop a Victorian Aboriginal health plan led by the Aboriginal community-controlled health sector, in partnership with the mainstream health sector and Victorian Government, to deliver on Aboriginal self-determined priorities. This strategic collaboration held a second AHWPF meeting in August 2021, continuing to build the important partnerships across the health system.

More information on the AHWPF is on the [VACCHO website](https://www.vaccho.org.au/ahwpf/) <<https://www.vaccho.org.au/ahwpf/>>.

Health outcomes for Aboriginal Victorians

The holistic health and wellbeing outcomes for Aboriginal people living in Victoria must be considered beyond the health data the department collects. The data represents generalised health information at the population level for Aboriginal Victorians but does not infer the health and wellbeing experience of individual Aboriginal people. The department recognises the risk of deficit discourse regarding the health and wellbeing of Aboriginal Victorians. The inequitable distribution of the social, economic, historical and cultural determinants of health contributes to the inequitable health outcomes for Aboriginal Victorians.

This includes Aboriginal Victorians experiencing higher levels of food insecurity (15.1% of Aboriginal Victorians), financial insecurity (28.4% of Aboriginal Victorians) and reduced sense of being valued by society (33.7% of Aboriginal Victorians) compared with non-Aboriginal Victorians (Department of Health, 2020a).

The following summary on Aboriginal Victorians' health and wellbeing in 2020 and 2021 is understood within this context of the wider determinants of health.

Aboriginal Victorians experienced higher rates of chronic, non-communicable diseases compared with non-Aboriginal Victorians including (Department of Health, 2020b):

- type 2 diabetes (approximately 6.5% of Aboriginal Victorians)
- heart disease (approximately 13.3% of Aboriginal Victorians)
- high blood pressure (approximately 29.2% of Aboriginal Victorians).

However, Aboriginal Victorians had lower rates of high cholesterol compared with non-Aboriginal Victorians, at approximately 15.8% of Aboriginal Victorian population (compared with 20.5% of non-Aboriginal Victorians).

Aboriginal Victorians experienced higher rates of substance use than non-Aboriginal Victorians including almost twice the rate of current tobacco smoking status at 30.9% of Aboriginal Victorians (compared with 16.2% of non-Aboriginal Victorians) (Department of Health, 2020b). Limited data is available for alcohol consumption patterns among Aboriginal Victorians in 2020 and 2021.

Aboriginal Victorians experienced disproportionately higher rates of complications from drug-related harm, with Aboriginal people accounting for 4.3% of fatal overdoses in 2020 and 4.4% in 2021 (Coroners Court of Victoria, 2023).

Aboriginal Victorians presented to Victorian health services with higher social and emotional wellbeing needs than non-Aboriginal Victorians. Compared with non-Aboriginal Victorians, Aboriginal Victorians had higher rates of (Department of Health, 2020a):

- high or very high psychological distress (30.9%)
- depression and/or anxiety (50.7%).



30.9%

of Aboriginal Victorians had high psychological distress



50.7%

of Aboriginal Victorians had depression or anxiety

The department recognises that these inequitable health outcomes occur in the context of the racism and discrimination disproportionately experienced by Aboriginal Victorians (Department of Health, 2020a):

- Aboriginal Victorians experience discrimination at significantly higher rates (26.2%) than non-Aboriginal Victorians (14.1%)
- Aboriginal Victorians experience racism at significantly higher rates (17.0%) than non-Aboriginal Victorians (5.3%).

Impact of COVID-19

Like all Victorians, Aboriginal people living in Victoria were affected by the COVID-19 pandemic. Nearly 3% of Aboriginal people in Victoria tested positive to COVID-19 during 2020 and 2021. The first 2 years of the pandemic further impacted Aboriginal people, including challenges accessing health care and delayed diagnoses experienced across the wider Victorian communities. However, through the leadership of the Aboriginal community-controlled health sector and collaboration with the department, effective preventative health and health promotion strategies reduced the spread of COVID-19 within Aboriginal communities.

The Aboriginal community-controlled health sector were important health leaders in managing the wraparound support for Aboriginal Victorians during the periods of movement restrictions. The community-controlled organisations were also key partners to the department in rolling out COVID-19 vaccinations from 2021. By the end of 2021, 85.6% of Aboriginal people in Victoria aged 16 or older had received 2 doses of COVID-19 vaccinations. This is compared with the national vaccination rate for Aboriginal people aged 16 or older at 71.0%. In Victoria, 21 Aboriginal Community Controlled Organisations were providing COVID-19 vaccinations during 2021 (Australian Government, 2022).

Also in 2021, a Public Health Emergency Order was issued to enable Aboriginal health practitioners in Victoria to administer COVID-19 vaccines. This improved vaccination access and uptake among Aboriginal communities (Secretary to the Department of Health, 2021).

Aboriginal health and wellbeing in the Treaty era

The department, as part of the Victorian Government, is working towards Australia's first Treaty with Aboriginal Victorians. Treaty in Victoria is the embodiment of Aboriginal self-determination in recognition of the sovereignty of Aboriginal people. It provides a path to negotiate the transfer of power and resources to Aboriginal people and communities to control matters that affect their lives. The department's work in partnership with the Aboriginal community-controlled health sector to improve Aboriginal health and wellbeing outcomes will align with progress towards Treaty.



Aboriginal Victorians are discussed more in the 'Who we are' and the 'COVID-19 pandemic' chapters.

Find out more about Aboriginal Victorians

For more information, refer to the [Report of the Chief Health Officer Victoria 2018 and 2019](https://www.health.vic.gov.au/population-health-systems/your-health-biennial-report) <<https://www.health.vic.gov.au/population-health-systems/your-health-biennial-report>>.

Sex and gender inequalities in health

Research and evidence increasingly show that sex and gender are significant determinants of health outcomes. While there are no universally accepted definitions of sex and gender, it must be acknowledged these are different concepts that should not be used interchangeably.

WHO defines these concepts in the following way (WHO, 2022a):

Term	Definition
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.

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

There is evidence that the following are all influenced by either sex or gender or both sex and gender:

- the risk of developing certain diseases
- the way people present with disease
- how well people respond to treatments
- people's health-seeking behaviour.

This is because there are conditions unique to females, such as peripartum cardiomyopathy (a deterioration in heart function presenting in women around childbirth), 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 (Mauvais-Jarvis et al., 2020). 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 et al., 2020).

Some climate-related health impacts also differ between genders. For example, male suicide rates have been found to increase faster with increasing temperatures, while mortality from heatwaves is higher in women (Beggs et al., 2019; Malone and Brenkert, 2009). Women are also disproportionately affected by climate change in emergency and disaster situations, such as through increases in violence against women following bushfires (Parkinson, 2011; 2022). 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 sexes, research is often conducted in males only, but findings are generalised to females (Merone et al., 2022). Clinical guidelines are not sex specific – for example, in relation to preventing type 2 diabetes in women who have had gestational diabetes (O'Reilly, 2014). 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.

A snapshot of sex and gender differences in health conditions and outcomes reveals:

- The reference range of the diagnostic blood test for heart attack (serum troponin) favours male biology, which means many women experience a delayed diagnosis or a misdiagnosis (Shah et al., 2017).
- Women often underestimate their risk of myocardial infarction compared with men and seek consultation later than men (Shah et al., 2017).

- With the onset of menopause, the risk of cardiovascular disease, breast cancer and osteoporosis increases significantly (Jean Hailes for Women's Health, 2024).
- Orthopaedic devices are designed based on the anatomy of men, which contributes to higher complications and higher avoidable costs of care for women (Hutchison, 2019).
- Autoimmune diseases affect approximately 8% of the global population, but close to 80% of those affected are women (Angum et al., 2020).

Consultations for the Victorian women's sexual and reproductive health plan and the sexually transmissible infections plan

The *Victorian women's sexual and reproductive health plan 2022–30* aims to strengthen the sexual and reproductive health of Victorian women, girls and gender diverse people. It focuses on key issues across the life course such as menstrual health, contraception, abortion and assisted reproductive treatment.

The *Victorian sexually transmissible infections (STI) plan 2022–2030* aims to ensure Victorians are supported to achieve optimal sexual health and wellbeing and to reduce the transmission and impact of STI.

The plans are 2 of 7 plans that make up the *Victorian sexual and reproductive health and viral hepatitis strategy 2022–30*, which sets the overarching direction for sexual and reproductive health and viral hepatitis prevention, screening/testing, treatment and care.

In line with the *Gender Equality Act 2020*, a gender impact assessment of the overarching strategy was undertaken during its development. Gender impact assessments ensure policies, programs and services consider their impact on diverse population groups.

As part of consultation for developing the strategy, a workshop was undertaken with the Victorian STI sector on 6 October 2020, followed by a statewide meeting for the women's sexual and reproductive health sector on 28 June 2021. These meetings ensured the strategy was informed by the expertise of the relevant sectors. A facilitated consultation workshop with the women's sexual and reproductive health sector was held on 11 January 2022 to verify content.

STI notifications

STI notification data in Victoria between 2016 to 2021 published in the *Victorian women's sexual and reproductive health plan 2022–30* (Department of Health, 2022a) and the *Victorian sexually transmissible infections plan 2022–30* (Department of Health, 2022b) show that:

- There was a 32% increase in gonorrhoea notifications in females.
- The infection rate of infectious syphilis (less than 2 years' duration) doubled in females between 2016 and 2021.
- There was a 10% decrease of cases of late syphilis (2 years or more or unknown duration) in 2021 compared with 2020.

1800 My Options

Established in 2018, 1800 My Options, hosted by Women's Health Victoria, is a free statewide telephone and a geo-mapped database of providers of women's sexual and reproductive health services. This is available to all Victorian women and includes information on contraception, termination of pregnancy and sexual health.

To meet increased service demand, 1800 My Options expanded its call-taking hours by 2 hours each weekday in 2021. In the 2020-2021 financial year there were more than 4,060 callers to the phone line and more than 38,300 website sessions. The number of callers and unique visitors increased by 33% after extending operating hours (Women's Health Victoria, 2021; 2022).

Extra women's and sexual and reproductive health hubs

Since 2017 the Victorian Government has funded the progressive roll out of 8 women's sexual and reproductive health hubs to improve access to care closer to home. The hubs provide access to contraception methods, medical termination of pregnancy and STI testing and treatment.

Funding allocated in 2021–22 established another 3 new sexual and reproductive health hubs. These are located at Primary Care Connect in Shepparton, South West Healthcare in Warrnambool and Latrobe Community Health Service in Gippsland.

This recognises the significant role of dedicated women's health services in reducing the impact of gender inequality on health and wellbeing outcomes.

Women's health services will join with a network of organisations within Victoria's public health system, including Local Public Health Units and community health services, to strengthen local capacity for better and more equal health and wellbeing outcomes for Victorian women.

STI weeks

STI Testing Week: 15–21 November 2020

The communications approach for STI Testing Week 2020 focused on reinforcing and increasing awareness of STI testing in the context of re-engaging primary care due to COVID-19 interruptions to usual healthcare services. The campaign included a focus on where to go locally to get tested, which was aimed at driving both attitude (awareness of one's own sexual health and potential risk) and behaviour change (STI testing as per guideline recommendations) and included the following social and other media messages.



Syphilis – Talk Test Treat

Syphilis is a sexually transmissible infection (STI) that may have no symptoms

If left untreated it will stay in your body and can be passed on to sexual partners or to an unborn baby during pregnancy

Thankfully it is easy to cure

Talk Test Treat

See your local doctor, community health, sexual health or Aboriginal health service for help

For more information visit Better Health Channel
<https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/syphilis>

To receive this document in another format phone 1300 651 160, using the National Relay Service 13 36 77
 If required, or email the infectious diseases team <infectious.diseases@dhs.vic.gov.au>.

Authorised and published by the Victorian Government, 1 Treasury Place, Melbourne.
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 Available at Better Health Channel www.betterhealth.vic.gov.au/health/conditionsandtreatments/syphilis

VICTORIA Department of Health and Human Services

STI Testing Week: 17–23 October 2021

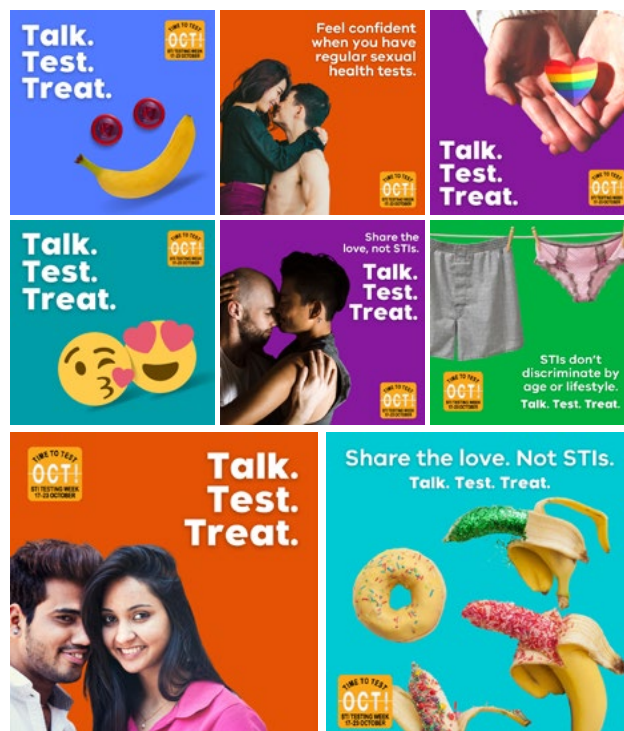
The communication approach was aimed at addressing increases in STIs by providing at-risk Victorians with information on why, when and where to get tested and seek treatment.

The campaign was aimed at Victorians aged 15 to 50 who were having sex, people planning a family, culturally diverse, LGBTQIA+ and Aboriginal communities.

The campaign reinforced the importance and positive benefits of regular sexual health testing, like feeling more confident and well, and the importance of treating STIs to avoid 'handballing' them to your partner(s).

The campaign used positive and affirming imagery with a focus on diversity to target key groups, and tongue-and-cheek graphics to tap into younger audiences.

Campaign partners included the Multicultural Health and Support Service to reach culturally diverse communities, and the Centre for Excellence in Rural Sexual Health to reach young people, especially in regional and rural Victoria.



Talk. Test. Treat. OCT 17-23 2021

Feel confident when you have regular sexual health tests.

Talk. Test. Treat. OCT 17-23 2021

Share the love, not STIs.
Talk. Test. Treat. OCT 17-23 2021

STIs don't discriminate by age or lifestyle.
Talk. Test. Treat. OCT 17-23 2021

Talk. Test. Treat. OCT 17-23 2021

Share the love. Not STIs.
Talk. Test. Treat. OCT 17-23 2021

LGBTIQA+ Victorians

The Victorian Government uses the initialism LGBTIQA+ (lesbian, gay, bisexual, trans and gender diverse, intersex, queer, asexual, and 'plus' for terms of identity not covered by the other letters). This is an inclusive umbrella abbreviation of diverse sexualities, genders and sex characteristics that covers a range of communities with distinct experiences, needs and histories of identity and organisation. In Australia the term has arisen in recognition of common experiences of legal and social marginalisation based on dominant social norms around sex, gender and sexuality (DFFH, 2023).

More than 1 in 20 adult Victorians (just under 6%) identify as being LGBTIQA+ (VAHI, 2017). Some communities within the umbrella are more visible than others. From an intersectional lens, it is also important to highlight the layers of inequity and discrimination faced by some communities such as LGBTIQA+ people of colour, refugees and people seeking asylum, people of faith or sex workers.



**More than
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LGBTIQA+
(just under 6%)**

Health outcomes for LGBTIQA+ people

Many LGBTIQA+ communities demonstrate pride, strength and community connectivity, which are protective factors for good health and wellbeing. Despite this, LGBTIQA+ Victorians experience higher levels of discrimination, stigma and exclusion, which can lead to poorer health, economic, social and mental health outcomes compared with non-LGBTIQA+ Victorians (DFFH, 2022).

Research into the health, mental health, economic and social outcomes of LGBTIQA+ people shows they face more challenges than the general population.

In Australia, over 38% of LGBTIQA+ people report having a disability or long-term health condition, including mental health, compared with around 18% of the non-LGBTIQA+ population (Hill et al., 2021a). More LGBTIQA+ people in rural and regional areas rate their health as 'poor' or 'fair' compared with outer and inner suburban communities (VAHI, 2021).

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Rates of depression, anxiety and suicide are very high, with almost 1 in 2 LGBTIQA+ adults having been diagnosed with anxiety or depression compared with 1 in 4 non-LGBTIQA+ adults (DFFH, 2022). Data reported in 2021 indicates that 73.2% of LGBTIQA+ Victorians have thought about taking their own life, and 28.1% have attempted suicide (Hill et al., 2021b).

Health supports for LGBTIQ+ Victorians

The Victorian Government is committed to ensuring all Victorians have safe, healthy and happy lives and that LGBTIQ+ Victorians can experience the benefits of full participation in economic, educational, political, community and social areas at all stages of life.

The 2021–22 State Budget provided an initial \$6.5 million to deliver Victoria’s first LGBTIQ+ strategy: *Pride in our future*. LGBTIQ+ voices are at the heart of the strategy, with more than 1,600 LGBTIQ+ Victorians, their families, advocates and allies, organisations and broader community sharing their experiences to help develop the strategy (DFFH, 2022).

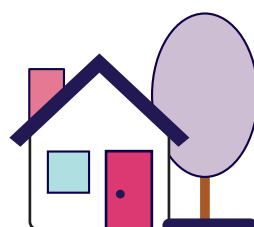
Part of this funding supported continued delivery of the Trans and Gender Diverse in Community Health initiative. This initiative provided gender-affirming care to 1,000 adults each year across 2 multidisciplinary clinics in Ballarat and Preston plus a health professional training program focused on inclusive and responsive gender-affirming health care.

The 2021–22 State Budget also provided \$21.4 million over 4 years to the Supporting the Mental Health of Trans and Gender Diverse Young People initiative to boost specialist services at the Royal Children’s Hospital and Monash Health, as well as mental health, primary medical and peer support services through Orygen, Transcend Australia and Transgender Victoria.

Refugee, asylum seekers and displaced people

Refugees and asylum seekers face more complex health needs

Victoria receives around one-third of all refugees and asylum seekers entering Australia, which is the most of any state or territory. Between 4,000 and 6,000 refugees settle in Victoria each year. While there are no official Commonwealth data on the total number of people who sought asylum after arrival in 2021 and 2022, it is estimated that around 11,000 to 20,000 people seeking asylum lived in the Victorian community on bridging visas while awaiting determination of their refugee status (Department of Health, 2024a). During this time many rely on Victorian Government support to meet basic health and wellbeing needs.



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refugees settle in
Victoria each year**

Refugees present with unique health needs including due to hardships experienced during the refugee journey, torture and trauma history and the stressors of resettlement. Figures show that 1 in 10 are affected by long-term post-traumatic stress disorder, have an increased likelihood of complex health conditions and some infectious diseases, and language and health literacy barriers (Australian Institute of Family Studies, 2022; Khatri and Yibeltal, 2022; WHO, 2022b).

This can be compounded for people seeking asylum by limited access to mainstream safety net supports such as Medicare, income support and subsidised medicines, and the prolonged uncertainty of the visa determination process.

Refugees and people seeking asylum have been found to have

3 to 4
times more mental health conditions than the wider Australian population



Refugees and people seeking asylum have been found to have 3 to 4 times more mental health conditions than the wider Australian population and lower levels of mental health literacy (De Maio et al., 2017; Shawyer, et al. 2017; Slewa-Younan, et al. 2017). Also, refugee background children and adults have very low vaccination completion rates, peaking at 19% (Paxton et al. 2018).

Despite these challenges, these communities show tremendous strength and resilience in overcoming adversity to start a new life in Victoria.

COVID-19 pandemic disproportionately affected Victoria's most vulnerable communities

Refugees and people seeking asylum were significantly impacted by COVID-19 in 2020 and 2021. This includes experiencing poorer health outcomes and increased presentations at emergency departments and secondary healthcare settings (Bull et al., 2022).

The clinical and sociodemographic drivers for this disproportionate impact included (Jiang et al., 2021):

- increased risk of exposure and severe manifestation of COVID-19
- socioeconomic factors preventing proper isolation
- less access to primary and speciality care
- distrust of medical institutions
- higher rates of pre-existing conditions
- multimorbidity.

Health supports for refugees and people seeking asylum

In Victoria, refugees and people seeking asylum can access state-funded health care regardless of visa or Medicare status. Victoria is deeply committed to facilitating a safe, welcoming and inclusive society, in which everyone can access the services and support they need, regardless of their visa status.

The department continues to work with the Victorian Refugee Health Network and community service providers to help the Victorian health sector support the health and wellbeing of people who arrived in Victoria as refugees or asylum seekers.

In 2020–21 and 2021–22, the Victorian Government committed \$3.9 million to address rising destitution and vulnerability for people seeking asylum. The funds were to boost the capacity of specialist asylum seeker programs to deliver crisis support and engage government services in the immediate and longer term response (Department of Health, 2024b). This investment provided people seeking asylum with primary health care, mental health support, case coordination and homelessness and basic needs assistance.

Multicultural communities

Victoria is home to one of the most culturally diverse societies in the world, and we are among the fastest growing and most diverse states in Australia. Victoria's rich cultural, religious and linguistic diversity is one of our greatest strengths and brings many social and economic benefits.

The 2021 Census revealed (ABS, 2021):

- About 30% of Victoria's population was born overseas, an increase from just over 28% in 2016. This is greater than the national percentage of more than 27%.
- Almost half of Victorians were either born overseas or have a parent born overseas. More than 41% of Victorians reported having both parents born overseas.
- The proportion of overseas-born Victorians who come from non-main English-speaking countries was 77.7% – the highest of any Australian state or territory.
- More than 27% of Victorians reported speaking a language other than English at home.
- More than half (54%) of Victoria's population follow one of more than 140 different faiths.



Almost half of Victorians were either born overseas or have a parent born overseas

Multicultural communities experience significant health and wellbeing disparities

Compared with the Australian-born population:

- Australians born in some overseas countries have a higher prevalence of dementia, heart disease, stroke, diabetes and kidney disease, particularly for people born in Polynesia, South Asia and the Middle East. Higher rates of chronic disease are associated with low English proficiency and more than 10 years of settlement in Australia (AIHW, 2023a).
- People born overseas have a higher prevalence of some infectious diseases, representing 92% of hepatitis B cases, 13% of hepatitis C cases, more than 40% of new diagnoses of HIV and more than 86% of tuberculosis notifications (Department of Health, 2022; Department of Health and Aged Care, 2020).

During the COVID-19 Delta wave, more than 70% of people who died from COVID-19 were born overseas (ABS, 2022).

Pregnant people born overseas are less likely to have their first antenatal visit in the first trimester (76.2% compared with the Victorian average of 80.7%) (AIHW, 2023b). Pregnant people of refugee backgrounds experience barriers in accessing and engaging in antenatal care and have higher rates of stillbirth and perinatal mortality than Australian-born pregnant people (Yelland et al., 2020).

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Burden of disease

Burden of disease – chapter overview

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, which is the number of years of healthy life lost due to death and illness (AIHW, 2021a).

In Australia, burden of disease is measured for more than 200 diseases and injuries (grouped into 17 disease groups). Also, the 2018 burden of disease study considers modifiable risk factors to disease burden, age at death and severity of disease to estimate the total health loss (AIHW, 2021a; 2021b).

Acknowledging that where we live, grow, learn, work and age has an impact on our health and wellbeing, a large proportion of the disease burden can be prevented, and their impacts reduced or avoided, by people making healthier lifestyle choices.

This chapter 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.

Note: Some content in this chapter is reflected in the 2019 *Your health* report. For the period of calendar years 2020 and 2021 the Burden of Disease study for 2018 remains the latest analysis available.

Leading causes of disease and injury

Most of Australia's total burden of disease in 2018 was from chronic diseases and injury (AIHW, 2021a).

The 5 leading disease groups in 2018 were:

- cancer (18%)
- musculoskeletal conditions (13%)
- cardiovascular diseases (13%)
- mental and substance use disorders (13%)
- injuries (8.4%).

Some population groups face a greater burden than others

The Australian Burden of Disease Study shows the considerable variation in deaths and years of life lost across population groups, notably (AIHW, 2021a):

- 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.
- In 2018 Aboriginal Australians experienced twice the rate of disease burden compared with non-Aboriginal Australians. This rate ratio has remained stable between 2013 and 2018.

Modifiable risk factors

- More than a third of Australia's disease burden is preventable.
- In 2018 the Australian Institute of Health and Welfare reported that 38% of the burden of disease could have been prevented by reducing or avoiding exposure to the modifiable risk factors examined in the Burden of Disease Study. The risk factors contributing to the greatest burden were smoking (8.6%), overweight and obesity (8.4%), dietary risk factors (5.4%), high blood pressure (5.1%) and alcohol use (4.5%).
- Tobacco use is the leading risk factor causing burden. The gap between tobacco use and overweight (including obesity) has almost closed (AIHW, 2021b).

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

Trends in risk factors in Victoria

- Smoking is still the greatest contributor to the disease burden. It is responsible for 8.6% of the disease burden in Australia (AIHW, 2021b).
- However, when all dietary factors are considered together – overweight and obesity (8.4%), dietary risks (5.4%) and high blood glucose (4.3%) – it is clear how important diet-related factors are when planning efforts to reduce our population's disease burden (AIHW, 2021b).

Causes of death

Leading causes of death in 2021

Nationally, in 2021, the top 5 leading causes of death accounted for more than one-third of all registered deaths, with all top 5 being non-communicable diseases (ABS, 2023). In 2021 there were 42,486 deaths in Victoria: 21,864 were male and 20,622 female (ABS, 2023).

- Ischaemic heart diseases remained the leading cause of death for males and females, accounting for 9.56% of all deaths (ABS, 2023).
- The second leading cause of death was 'malignant neoplasms of digestive organs' (including pancreatic, intestinal, liver, gastric and oesophageal cancers), which accounted for 8.68% of all deaths (ABS, 2023).
- Other forms of heart disease and cerebrovascular diseases were the third and fourth leading causes of death, counting for 6.02% and 5.58% of all deaths, respectively (ABS, 2023).

These numbers highlight the significant burden of cardiovascular diseases on the Victorian population (Table 13).

Table 13: Ten leading causes of death in Victoria in 2021

Causes of death	Males	Females	People	Percentage of all deaths
Ischaemic heart diseases	2,439	1,621	4,060	9.56
Malignant neoplasms of digestive organs	2,064	1,622	3,686	8.68
Other forms of heart disease	1,181	1,376	2,557	6.02
Cerebrovascular diseases	966	1,403	2,369	5.58
Malignant neoplasms of respiratory and intrathoracic organs	1,306	965	2,271	5.35
Organic, including symptomatic, mental disorders	781	1,348	2,129	5.01
Chronic lower respiratory diseases	908	871	1,779	4.19
Other degenerative diseases of the nervous system	604	1,068	1,672	3.94
Falls	717	768	1,485	3.50
Diabetes mellitus	697	577	1,274	3.00

Source: ABS 2023

Overweight and obesity

In 2018 the Australian Institute of Health and Welfare (2021b) reported that overweight and obesity was the second leading cause of modifiable disease burden in Australia, accounting for 8.4% of all disease burden.

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

Overweight and obesity are significant risk factors for hypertension, cardiovascular disease, type 2 diabetes, gall bladder 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 2020 was 51.0%. Table 14 shows that the proportion of men who were overweight and/or obese was significantly higher than 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, 2020).

Table 14: Proportion of overweight and obese Victorian adults 2020 (aged 18 or older)

Body mass index (BMI)	Men	Women	Overall
Overweight (BMI greater than 25)	58.2%	44.1%	51.0%
Overweight, but not obese (BMI 25-30)	37.0%	23.7%	30.2%
Obese (BMI greater than 30)	21.3%	20.9%	21.1%
Normal weight (BMI 18.5-25)	33.0%	39.5%	36.3%

Note: Estimates do not add to 100 per cent due to a proportion of 'don't know' or 'refused to say' responses, not reported here.

The proportion of adults who were normal weight was 36.3% overall, significantly lower in men (33%) than women (39.5%).

Overweight and obesity affects a quarter (25.0%) of Australian children and is associated with poorer health and wellbeing. Some children and adolescents are more likely to be overweight or obese, such as Aboriginal children and children living in disadvantaged areas. Many factors contribute to developing overweight and obesity, including environmental influences and individual behaviours (AIHW, 2020).

Dietary factors

Dietary risk factors were the third leading cause of modifiable disease burden in the 2018 Australian Burden of Disease Study, contributing to 9.9% of deaths and 8.8% of fatal burden. Overweight and obesity were also linked to diet (AIHW, 2021a).

Among these dietary risk factors, a diet low in legumes contributed the most to disease burden (1.2%), followed by a diet low in wholegrains/high fibre cereals, a diet high in sodium and high in red meat (all 0.9%), a diet low in fruit (0.8%), a diet low in nuts/seeds (0.7%) and a diet low in vegetables (0.6%) (AIHW, 2021a; 2021b).



Dietary risk factors are discussed more in the 'Healthy living' chapter.

High blood glucose burden

The rate of type 2 diabetes has risen in recent decades, particularly among older people. In 2020, 5.8% of Victorians reported having type 2 diabetes (VAHI, 2020).



High blood glucose burden is discussed more in the 'Healthy living' chapter.

Physical inactivity

In 2018 the Australian Institute of Health and Welfare reported that physical inactivity contributed to 8,253 (5.2%) deaths, 3.6% of fatal burden (84,717 years of life lost) and 1.5% of non-fatal burden (37,966 years lived with disability) in Australia (AIHW, 2021a).



Physical inactivity is discussed more in the 'Healthy living' chapter.

Preventing or modifying risk factors

There are opportunities to reduce modifiable risk factors across the life course. For example, children and adolescents living with obesity are 5 times more likely to be obese in adulthood than those who are not obese, with 80% of obese adolescents becoming obese adults (Simmonds et al., 2016). Action to reduce the proportion of young Victorians who are overweight and obese has benefits across the life course.

Risk factors such as overweight (including obesity) and physical inactivity have been modelled to see what could happen if Australians reduced their body mass index or were more physically active. Looking at this modelling for 2018–2030 indicates that small improvements to people's weight (losing around 3 kg) and exercise levels (an extra hour of moderate–intense activity per week) could have a big effect on the disease burden attributable to these 2 risk factors (AIHW, 2023).

Health and wellbeing outcomes are not shared equally by all Victorians. A stronger focus on specific health issues and risk factors facing priority groups is needed to improve health equity.



The Victorian Government's response to preventing/modifying risk factors is discussed more in the 'Healthy living' chapter.

Tobacco and vaping

Despite considerable progress in reducing smoking rates in Victoria, tobacco use was still the leading contributor to the national burden of disease and premature deaths in 2018 (AIHW, 2021a; 2021b).

The proportion of daily smokers in Victoria declined from 11.7% in 2016 to 10.2% in 2019. However, this decrease coincided with an increase in e-cigarette use, rising from 0.9% in 2016 to 2.4% in 2019 (AIHW, 2022). Among Victorian students, the smoking rate in 2017 more than halved from 9% in 2008 to 4%, while the rate of ever using a vape remained steady at 14% since 2014 (Centre for Behavioural Research in Cancer, 2024).

Smoking significantly increases the risk of lung cancer, cardiovascular disease, chronic obstructive pulmonary disease and many other illnesses. Evidence suggests that smoking kills nearly two-thirds of regular users, with smokers dying on average 10 years earlier than non-smokers (Banks et al., 2015). Tobacco use accounts for 8.6% of the disease burden and 13% of deaths in Australia, contributing to 22% of the cancer burden, 39% of the respiratory disease burden and 11% of cardiovascular diseases (AIHW, 2021a).

While the long-term harms of e-cigarettes are not yet fully known, there is growing evidence that their use, whether with or without nicotine, can lead to adverse health effects. Emissions from e-cigarettes contain numerous potentially hazardous substances and particulate matter, which are likely to cause diseases such as cancer and respiratory illnesses.



Tobacco and vaping are discussed more in the 'Healthy living' chapter.

Victorians' alcohol use in 2020 and 2021

Prevalence

In 2020 and 2021 Victorians experienced significant changes to their daily lives, with corresponding impacts on alcohol consumption. COVID-19 restrictions reduced many opportunities for drinking in social settings while also introducing potential new motivations to use alcohol to cope with stress, anxiety or isolation.

While consumers did stockpile packaged alcohol products early in the pandemic (Colbert et al., 2020), these behaviours did not seem to result in higher alcohol ingestion overall. Wastewater analysis suggests that the volumes of ethanol Victorians consumed in 2020 and 2021 were similar to both pre- and post-pandemic levels (Australian Criminal Intelligence Commission, 2024), although consumption patterns did change with the introduction and gradual removal of various COVID-19 restrictions (Chen et al., 2023).

This is consistent with survey data, with evidence suggesting there were both increases and decreases in drinking among different population groups (Mojica-Perez et al., 2022; 2024).

Harm

Despite encouraging resilience at the whole-population level, alcohol-related harm was an important concern for many Victorians in 2020 and 2021.

Increased drinking was most likely among those experiencing psychological distress and specific impacts of COVID-19 restrictions (Mojica-Perez et al., 2022).

Alcohol-related ambulance attendances showed a displacement to home settings, with significant spikes evident towards the end of each wave of restrictions (Ogeil et al., 2021).

Importantly, after being briefly surpassed by methamphetamine in 2019–20, alcohol resumed its place as the most commonly cited drug of concern among addiction treatment episodes of care, reaching 30.7% of treatment episodes in 2020–21 and 38.5% in 2021–22 (AIHW, 2024a; 2024b).

Burden of disease – chapter references

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Healthy living

Healthy living – chapter overview

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 the importance of quitting smoking.

Healthy eating

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

Good nutrition is essential for lifelong health and wellbeing in that it:

- supports optimal growth and development for children
- promotes good mental health
- supports a healthy immune system.

A healthy diet is important in maintaining a healthy body weight and plays a critical role in protecting against chronic disease.

Poor diet increases the risk of cardiovascular disease, type 2 diabetes and several cancers. Unhealthy dietary patterns (those higher in processed/discretionary foods) are associated with an increased risk of depression and anxiety. Diets high in vegetables, fruit, whole grains, seafood and healthy oils have been shown to reduce the risk of depression and anxiety (Jacka, 2011; Lane et al., 2023; Lassale et al., 2019).

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 5 food groups every day. These recommendations are outlined in the *Australian dietary guidelines* (NHMRC, 2013).

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. Discretionary food intake is associated with increased risk of chronic disease, even when there is a significant intake of nutritious foods. It is important to reduce discretionary food and drinks¹ that are high in energy, saturated fat, added sugar and/or salt. This includes sugar-sweetened beverages, cakes, biscuits, many takeaway or 'fast foods', and alcohol.



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

¹ Refer also to the definitions at the end of the 'Healthy eating' section.

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

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.

While adult fruit and vegetable intake (how many serves of fruit and vegetables eaten per day) was not measured in 2020–2021 due to the COVID-19 pandemic, in 2020, 10.1% of Victorian adults reported that they had decreased their usual intake of fruit and vegetables in response to the disruptions caused by the COVID-19 pandemic (VAHI, 2021). This is concerning, particularly for vegetable intake, given that in 2019, only 5.7% of adults in Victoria met vegetable consumption guidelines (1.8% of men, and 9.4% of women). Only 40.6% of adults met fruit consumption guidelines in 2019 (36.6% of men, and 44.4% of women) (VAHI, 2021).

The National Health Survey 2020–21 (ABS, 2022) found that for Australian adults (aged 18 years or older):

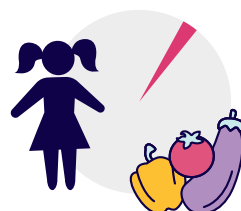
- almost 1 in 10 (8.7%) met the vegetable recommendation (5 to 6 serves, depending on age and sex)
- more than 2 in 5 (44.8%) met the fruit recommendation (2 or more serves)
- 6.1% ate the recommended amount of both fruit and vegetables.

Women aged 18 years or older were more likely to meet any of the recommendations than men (ABS, 2018):

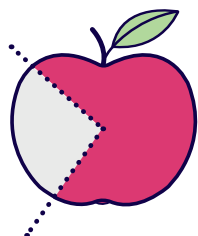
- 12.8% of women met the vegetable recommendation compared with 4.4% of men
- 48.3% of women met the fruit recommendation compared with 41.2% of men
- 9.0% of women met both recommendations compared with 2.9% of men.

In 2021, of Victorian children aged 4 to 12:

- Only 2.9% met the minimum guidelines for daily vegetable consumption. Overall, this is consistent with previous surveys (2013, 2017, 2019), except for children living in a one-parent family for whom there has been a significant decrease (from 2017 to 2019) in the proportion meeting the recommended vegetable intake.
- Nearly three-quarters (72%) met the minimum guidelines for daily fruit consumption – similar to previous survey results. Children living in the least disadvantaged areas, those in couple families, those not on a health care card, and those aged 4 to 8 years old were more likely to meet the guidelines compared with those in most disadvantaged areas, in one-parent families, on a health care card and children aged 9 to 12 years respectively (Department of Education and Training, 2023).



**Only
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of Victorian children
aged 4 to 12 years
met the minimum
guidelines for daily
vegetable consumption**



**Nearly
72%
of Victorian children
aged 4 to 12 years met the
minimum guidelines for
daily fruit consumption**

Sugar-sweetened beverages

Adult consumption of sugar-sweetened beverages was not measured in the Victorian Population Health Survey 2020–21 due to the COVID-19 pandemic.

The National Health Survey 2020–21 found that 6.4% of Australian adults consumed sugar-sweetened beverages² daily; furthermore, 7.1% consumed diet drinks daily. Overall, more men aged 18 years or older consumed sugar-sweetened drinks compared with women: 8.5% of men compared with 4.5% of women (ABS 2018; 2022).

In 2021, 1 in 5 (21.4%) children aged 1 to 12 years were reported by their parents to usually consume at least 1 cup of sweet beverage each day. The proportion of children consuming at least 1 cup of sweet drink per day declined from 28.8% in 2013 to 18.7% in 2019 and rose slightly to 21.2% in 2021 (ABS, 2022)

Disparities between population groups have persisted over the long term. Children living in the most disadvantaged areas and those listed on a health care card were almost twice as likely as their comparison population groups to consume a cup of sweet beverage each day.

Children aged 9 to 12 years, and those in one-parent families, were also more likely to consume sweet beverages than younger children and those in couple families (Department of Education and Training, 2023).

Takeaway or 'fast' foods

Adult consumption of takeaway foods was not measured in the Victorian Population Health Survey 2020–21 due to the COVID-19 pandemic. However, the VicHealth Coronavirus Victorian Wellbeing Impact Studies measured the frequency of takeaway food per week for adults and children as a proxy measure for discretionary food intake, and whether this was more, the same or less compared with before the pandemic.

In Survey 2 (September 2020), 4% of Victorians consumed takeaway 3 or more times per week, and this was significantly higher in respondents:

- aged 18 to 24 years (8%) and 25 to 34 years (10%)
- those living in inner metropolitan regions of Victoria (9%)
- identifying as employed (6%)
- living in bushfire-affected areas (14%)
- eligible for JobKeeper (10%).

The proportion of respondents who reported consuming less takeaway food compared with before the pandemic was approximately double the proportion of those who reported consuming more (36% reported 'less' compared with 16% reporting 'more').

Approximately 5% (1 in 20) parents reported that their children were eating takeaway foods 3 or more times per week in Survey 2. The highest levels of takeaway food consumption were reported for children aged between 12 and 17 years (6%), followed by 5% for 1 to 11-year-olds.

² Refer also to the definitions at the end of the 'Healthy eating' section.

Food insecurity

Food insecurity with hunger

In 2020, 5.9% of adults experienced food insecurity (in the past year had run out of food and could not afford to buy more). Furthermore, 34% of adults who experienced food insecurity had children aged 17 years or younger, and this was significantly higher compared with 30% of adults who did not (VAHI, 2021).



**In 2020,
5.9%
of adults experienced
food insecurity (in the
past year had run out
of food and could not
afford to buy more)**

Food insecurity without hunger

In 2020 worrying about running out of money to buy food (food insecurity without hunger) affected about 1 in 4 survey participants. A quarter (25.8%) reported they were more frequently worried (sometimes, or yes definitely) about running out of money to buy food during the pandemic, with a significantly higher proportion of younger age groups reporting this (18–44-year-olds), and significantly lower proportion of older age groups (55 years or older). This has doubled since 2014, where 1 in 8 adults worried about running out of money to buy food.

Food insecurity without hunger was disproportionately experienced by some key sub-populations. These at-risk groups included:

- younger adults (aged 18–44 years)
- adults identifying as Aboriginal and/or Torres Strait Islander (2 in 5)
- those born overseas
- those whose language spoken at home was other than English
- those without a university qualification
- people who were widowed, divorced or separated
- single parents
- people who were unemployed or not in the labour force
- those with an annual household income of less than \$60,000
- people who rented their home from government/community housing or privately
- those most socioeconomically disadvantaged.

Those who reported significantly more frequent worry about running out of money to buy food included:

- those with low to medium levels of life satisfaction
- those with high or very high levels of psychological distress
- smokers
- those with fair/poor self-reported health status
- those with 2 or more chronic diseases
- those who had experience of discrimination.

Body mass index was associated with a significantly higher proportion of Victorians who were underweight or obese experiencing worry about running out of money to buy food more often (35% and 29.7% respectively) (VAHI, 2021).

Victorian Government action

A range of complementary government actions are helping to ensure sustained change including:

- establishing a specialist Ministerial Food Relief Taskforce with senior representatives of the food relief sector, peak bodies and key government officers to advise on strategies and initiatives to strengthen Victoria's food relief system
- committing to supporting food relief providers to supply nutritious, culturally appropriate (and dignified) food relief offerings
- committing to supplying food to vulnerable Victorians during the pandemic through establishing a Community Food Relief Fund, providing one-off grants to 93 community sector agencies
- setting up 5 designated regional food relief hubs to increase food relief storage, strengthen links with suppliers and improve distribution services in regional Victoria
- significant investment to expand the school breakfast program from 500 to 1,000 participating schools, and by providing lunches and school holiday supplies to those most in need
- accelerating the uptake of the [Healthy Choices policy/guidelines](https://www.health.vic.gov.au/preventive-health/healthy-choices) <<https://www.health.vic.gov.au/preventive-health/healthy-choices>> to promote 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](https://heas.health.vic.gov.au/) <<https://heas.health.vic.gov.au/>>
- strengthening the uptake of aligned healthy food policies and guidelines in early years services and schools, supported by the Healthy Eating Advisory Service
- developing a healthy and more sustainable food procurement policy across government departments
- delivering the [Healthy Schools, Healthy Early Childhood Services and Healthy Workplaces Achievement Program](https://www.achievementprogram.health.vic.gov.au/) <<https://www.achievementprogram.health.vic.gov.au/>> (led by Cancer Council Victoria) – this initiative is a free health and wellbeing program that provides quality health promotion benchmarks and government recognition for key areas of health including healthy eating and oral health, mental health, physical activity, sexual health, tobacco and 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 2 and 5) and positive impacts on fruit, vegetable, water; less sugar-sweetened beverage intake; and less television watching
- 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's (VACCHO) Nutrition team, which works with member Aboriginal community organisations and key stakeholders to improve food and nutrition outcomes for Aboriginal communities across Victoria (visit the [VACCHO website](https://www.vaccho.org.au/member-services/workforce-development-2/nutrition/) <<https://www.vaccho.org.au/member-services/workforce-development-2/nutrition/>> for more information)

- delivering the Victorian Healthy Eating Enterprise, which provides a coordinated platform where local governments, businesses, community health services, academics, health professionals and peak health bodies can progress collective action on the healthy eating priorities of *Victoria's public health and wellbeing plan 2019–2023*
- launching, in October 2021, the [Healthy Kids, Healthy Futures](https://www.health.vic.gov.au/health-strategies/healthy-kids-healthy-futures) <<https://www.health.vic.gov.au/health-strategies/healthy-kids-healthy-futures>> 5-year action plan, which supports children and young people to be healthy, active and well in the places they spend their time (such as early years settings, schools, out-of-school-hours care and sporting clubs and facilities)
- as part of Healthy Kids, Healthy Futures, working with partners and settings to surround Victoria's children with healthier, nourishing food and drinks via the flagship Vic Kids Eat Well program and Healthy Kids Advisors, directing effort where it is needed most
- through VicHealth, funding community-level food security responses and support efforts working towards healthier, more sustainable food systems.

Find out more about healthy eating

For more information on healthy eating, read about the department's 'Healthy eating' priority in the [Victorian public health and wellbeing plan 2023–2027](https://www.health.vic.gov.au/victorian-public-health-and-wellbeing-plan-2023-27) <<https://www.health.vic.gov.au/victorian-public-health-and-wellbeing-plan-2023-27>>.

Definitions – healthy eating

Discretionary foods and drinks

Discretionary foods and drinks have higher levels of kilojoules and/or saturated fat, added sugars, added salt and/or alcohol. They are associated with increased risk of obesity and chronic disease such as heart disease, stroke, type 2 diabetes and some forms of cancer. These foods and drinks also tend to have low levels of essential nutrients. Discretionary foods and drinks include sweet biscuits, cakes, desserts and pastries; processed meats and fattier/salty sausages; sweetened condensed milk; ice cream and other ice confections; confectionary and chocolate; savoury pastries and pies; commercial burgers with a high fat and/or salt content; commercially fried foods; potato chips, crisps and other fatty and/or salty snack foods including some savoury biscuits; cream, butter and spreads that are high in saturated fats; sugar-sweetened soft drinks and cordials, sports and energy drinks and alcoholic drinks.

Reference: National Health and Medical Research Council (2013) [Australian dietary guidelines](https://www.eatforhealth.gov.au/), National Health and Medical Research Council, Canberra. Available at: <<https://www.eatforhealth.gov.au/>>

Sweetened beverages – adults

Sugar-sweetened drinks include soft drinks, cordials, sports drinks and caffeinated energy drinks. This may include soft drinks in ready-to-drink alcoholic beverages but excludes fruit juice, flavoured milk, 'sugar-free' drinks, coffee and hot tea. This was reported on usual consumption per day/week.

Reference: Australian Bureau of Statistics (2022) [National Health Survey: first results methodology](https://www.abs.gov.au/methodologies/national-health-survey-methodology/2020-21). Available at: <<https://www.abs.gov.au/methodologies/national-health-survey-methodology/2020-21>>

Sugar-sweetened beverages – children

The Victorian Child Health and Wellbeing Survey asks parents of Victorian children aged 1 to 12 years how many cups of soft drink, fruit juice (including freshly squeezed juice), cordials or sports drink they usually drink in a day.

Reference: Department of Education and Training (2023) *Victorian Child Health and Wellbeing Survey 2021: summary report*, State of Victoria, Melbourne. Available at: <<https://www.vic.gov.au/victorian-child-health-and-wellbeing-survey>>

Active living

Active living supports health and wellbeing at all stages of life. Regular physical activity promotes healthy growth and development and helps to prevent and manage chronic disease such as heart disease, certain cancers, diabetes and musculoskeletal conditions (Booth et al., 2012; Pedersen and Saltin, 2015). Physical activity also plays an important role in mental wellbeing. Regular physical activity not only improves mood, concentration and sleep, it also plays an important role in preventing and managing anxiety and depression (Altermann and Gröpel, 2023; Singh et al., 2023; Thomas et al., 2020). 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 (Brand et al., 2021; Mizdrak et al., 2019).

How much physical activity is enough

Table 15 outlines Australia's physical activity and sedentary behaviour guidelines for adults.

Table 15: Australia's physical activity and sedentary behaviour guidelines for adults

Table 15a: People aged 18 to 64 years	
Behaviour	Guidelines
Physical activity	<ul style="list-style-type: none">• Doing any physical activity is better than doing none. If you do no physical activity right now, start by doing some, then slowly build to the recommended amount.• Adults should be active most days, preferably every day.• Each week, adults should do either:<ul style="list-style-type: none">– 2.5 to 5 hours of moderate-intensity physical activity such as a brisk walk, golf, mowing the lawn or swimming– 1.25 to 2.5 hours of vigorous physical activity such as jogging, aerobics, fast cycling, soccer or netball or an equivalent combination of moderate and vigorous activities.• Include muscle-strengthening activities as part of your daily physical activity on at least 2 days each week.
Sedentary behaviour	<ul style="list-style-type: none">• Minimise the amount of time spent in prolonged sitting.• Break up long periods of sitting as often as possible.

Table 15b: People aged 65 years or older	
Behaviour	Guidelines
Physical activity	<ul style="list-style-type: none">• Adults over 65 years should do at least 30 minutes of moderate-intensity physical activity on most, preferably all, days.• If you find 30 minutes difficult right now, start with just 10 minutes once or twice a day. After 2 weeks, increase to 15 minutes twice a day.• If you can do more than 30 minutes, you will get extra benefits.• Over the course of the week, try to incorporate different types of activities.
Sedentary behaviour	<ul style="list-style-type: none">• Try to reduce the time you spend sitting down – break that time up as often as you can.

Adapted from Department of Health and Aged Care, 2021

Table 16 outlines Australia's movement guidelines for children from birth to 5 years.

Table 16: Australian 24-hour movement guidelines for the early years (birth to 5 years): an integration of physical activity, sedentary behaviour and sleep

Table 16a: Infants (aged less than 1 year)	
Behaviour	Guidelines
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.
Sedentary behaviour	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.
Sleep	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.

Table 16b: Toddlers (aged 1 to 2 years)	
Behaviour	Guidelines
Physical activity	At least 180 minutes spent in a variety of physical activities, including energetic play, spread throughout the day. More is better.
Sedentary behaviour	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 2 years, sedentary screen time is not recommended. For those aged 2 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.
Sleep	11 to 14 hours of good-quality sleep, including naps, with consistent sleep and wake up times.

Table 16c: Preschoolers (3 to 5 years)

Behaviour	Guidelines
Physical activity	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.
Sedentary behaviour	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.
Sleep	10 to 13 hours of good-quality sleep, which may include a nap, with consistent sleep and wake-up times.

Adapted from Department of Health and Aged Care, 2017

Table 17 outlines Australia's movement guidelines for children and young people (aged 5 to 17 years).

Table 17: Australia's 24-hour movement guidelines for children and young people (5 to 17 years)

Behaviour	Guidelines
Physical activity	<ul style="list-style-type: none"> • Accumulating 60 minutes or more of moderate to vigorous physical activity per day involving mainly aerobic activities. • Activities that are vigorous, as well as those that strengthen muscle and bone, should be incorporated. • Several hours of a variety of light physical activities.
Sedentary behaviour	<ul style="list-style-type: none"> • Limiting sedentary recreational screen time to no more than 2 hours per day (excluding screen-based activities for educational uses). • Breaking up long periods of sitting as often as possible. • For greater health benefits, replace sedentary time with extra moderate to vigorous physical activity, while preserving sleep.
Sleep	<ul style="list-style-type: none"> • 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. • Consistent bed and wake-up times. Activities that are vigorous, as well as those that strengthen muscle and bone, should be incorporated at least 3 days per week.

Adapted from Department of Health and Aged Care, 2019

Physical activity – impacts of COVID

The 2020–2021 COVID-19 public health measures affected the population's physical activity participation in different ways. In June 2020 national data showed that 21% of Australian adults (aged 18 or older) had increased their physical activity levels, while 19% of the population reported they had decreased their physical activity compared with pre-pandemic levels (AIHW, 2021). In late 2020 to early 2021, about 46% of Victoria's adult population reported decreasing their usual level of physical activity (VAHI, 2022).

Participation in recreational and fitness activities were least impacted by COVID-19 restrictions (such as walking, bike riding and home exercise). However, people's participation in structured exercise and team sports significantly decreased during this time. This trend has persisted, with fewer Australians relying solely on sporting clubs or organised venues for exercise (compared with pre-pandemic times).

Activities such as walking (recreational) and bushwalking increased in both 2020 and 2021 (Australian Sports Commission, 2022).

Victorians who were more physically active during the April–May 2020 COVID-19 restrictions cited 3 primary reasons for exercising more: extra time available, health and the desire to 'get out of the house' (VicHealth, 2021).

The observation that COVID-19 measures affected segments of the population differently is supported by Our Life at Home, a study of 2,000 Australian adults and children during COVID-19 restrictions. This study observed that the early restrictions of 2020 had a positive impact on the proportion of adults meeting physical activity recommendations, a negative impact on the proportion of Australian children meeting the recommendations, and had no change among adolescents (Arundell et al., 2022).

Physical activity and sedentary behaviour – who met the guidelines?

Adults

The 2020 Victorian Population Health Survey did not capture data on physical activity participation rates. However, the National Health Survey conducted in 2020–21 can be used to provide an overview of indicative physical activity trends. Given the methodological differences and COVID-19 context, this data should be used as a point-in-time snapshot only and not compared with previous years.

During 2020–21 an estimated 35% of Australian adults aged 18 to 64 were insufficiently physically active, and 75% of adults aged 18 to 64 did not meet both the physical activity component and the muscle-strengthening component of the *National physical activity guidelines*. This proportion was higher in women (78%) than men (73%) (ABS, 2022). The proportion of Australian adults aged 18 years or older who reported doing 'no physical activity' was 13.5%. Those with higher education levels and those living in higher socioeconomic communities were significantly more likely to meet the physical activity guidelines and significantly less likely to report doing 'no physical activity' (ABS, 2022).

Children and young people

The Victorian Child Health and Wellbeing Survey reports that less than half of Victorian children (47.3%) aged 5 to 12 years were reportedly physically active for an hour every day in 2021. This is lower than reported in 2019 (51.8%). It represents a significant decrease from 2013, when 62.2% of children aged 5 to 12 were physically active for an hour a day (Department of Education and Training, 2023).

For older children aged 15 to 17 years, 73% did not meet the national guideline of 60 minutes of physical activity per day, and 78% did not do the recommended 3 days a week of muscle-strengthening activity (ABS, 2022).

Screen time

In 2021 the proportion of Victorian children (aged 5–12 years) who exceeded the recommended daily screen time limit of 2 hours (excluding usage for online learning) was 32.5%, a significant increase from 18% reported in 2019 (Department of Education and Training, 2023). Time spent by school-aged children on screens and digital media during 2020–2021 has been one of the most frequently reported changes to children's lifestyle during the pandemic (Royal Children's Hospital, 2021).



In 2021,

32.5%
of Victorian children
aged 5–12 years
exceeded the recommended
daily screen time limit of 2 hours
(excluding usage for online
learning), a significant increase
from 18% reported in 2019.

What the government is doing

School Sport Victoria's *Strategic directions 2020 to 2030* is providing a clear direction to engage more Victorian students in physical activity through school sport, where children often play sport for the first time.

Confirming their commitment to physical activity for children and young people, the ministers for education, for health and for community sport have released the joint ministerial statement on physical activity – *Active schools, active kids, active communities*.

Other government action includes:

- implementing the Active Schools initiative to ensure all Victorian students have the skills, confidence and motivation to be active for life.
- a commitment to reducing the barriers to taking part in sport and active recreation for women and girls including developing the *Fair access policy roadmap* to improve gender equitable access and use of publicly owned community sports infrastructure across Victoria
- building on the work undertaken through the 20-minute neighbourhood pilot project to embed healthy and active design principles into planning policy to create healthier communities.

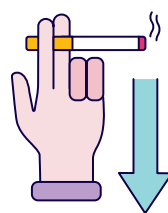
Find out more about active living

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

Tobacco and vape-free living

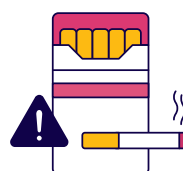
Harms from tobacco use

Despite significant progress in reducing smoking rates in Victoria, tobacco use remains a major contributor to disease and premature death. The decline in smoking rates has recently plateaued, with the proportion of daily smokers changing little from 13.3% in 2015 to 12.1% in 2020. Smoking rates were higher among adults in rural areas (14.1%) compared with metropolitan areas (11.5%) (VAHI, 2022).



The decline in smoking rates has plateaued, with daily smokers only decreasing from 13.3% (2015) to 12.1% (2020)

In 2020, smoking rates were higher among adults in rural areas



14.1% compared with adults in metropolitan areas 11.5%

Smoking accounts for about 8.6% of the disease burden and nearly 13% of deaths in Australia (AIHW, 2018). It significantly increases the risk of lung cancer, cardiovascular disease, chronic obstructive pulmonary disease and many other illnesses. Smokers typically die 10 years earlier than non-smokers, and about two-thirds of smokers will die from a smoking-related illness (Banks et al., 2015).

Smoking imposes considerable distress on individuals, families and communities, costing the Victorian economy around \$3.7 billion in tangible costs, such as health care, and \$5.8 billion in intangible costs related to loss of life annually (Creating Preferred Futures, 2018).

The health burden of tobacco extends beyond smokers. Second-hand smoke or aerosol from cigarettes, cigars, pipes, hookahs or e-cigarettes can also lead to adverse health effects. Toxins from third-hand smoke can linger in carpets, walls, furniture, clothing, hair and toys, posing health risks, especially to children. Children in smoking households are more likely to suffer from bronchiolitis and other respiratory conditions (Jones et al., 2011), and infants are at a higher risk of sudden infant death syndrome.

Increase in e-cigarette use or vaping

E-cigarette use, or vaping, has been on the rise since 2019, including among young people and non-smokers. The proportion of Victorians using e-cigarettes increased from 0.9% in 2016 to 2.4% in 2019. Lifetime use among people aged 18-24 rose from 19.2% to 26%, and for those aged 25 to 29, it rose from 14.8% to 20% (AIHW, 2019).

Some advocates promote e-cigarettes as a smoking cessation tool, perceiving them as less harmful than smoking. However, many smokers who use e-cigarettes continue to smoke, resulting in no significant reduction in health risks. The effectiveness of e-cigarettes in smoking cessation is inconclusive, and they are not recommended as a first choice for nicotine replacement therapy.

The growing use of e-cigarettes is concerning, as evidence shows they can lead to health issues such as nicotine dependence, poisoning, seizures, burns, injuries and lung injury, as well as increased smoking uptake in non-smokers (Banks, 2022). The long-term effects of vaping are still being studied, but emerging evidence indicates significant health risks.

E-cigarettes contain numerous hazardous substances that pose potential health risks through first-hand and second-hand inhalation. Particulate matter in e-cigarette emissions further complicates their safety. E-cigarettes, often sold in appealing flavours, could lead to nicotine addiction in a new generation and undermine efforts to reduce smoking rates.

Non-smokers who use e-cigarettes are 3 times more likely to start smoking compared with non-users (Baenziger et al., 2021).

Victoria takes a precautionary approach to e-cigarettes. At the time of publication, no e-cigarette products had been approved by the Therapeutic Goods Administration for smoking cessation. Current evidence supports efforts to avoid e-cigarette use, particularly among non-smokers and youth.

At-risk cohorts

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.

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+
- people experiencing homelessness
- people living with mental illness
- people experiencing social or economic disadvantage.

That means the most vulnerable members of the community are at higher risk of health harms.

Socioeconomically disadvantaged people 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 (VAHI, 2021).

The proportion of adults who smoked daily was significantly higher among adults who lived in rural Victoria (14.1%) compared with those who lived in metropolitan Victorian (11.5%) (VAHI, 2021).

Reflecting the efforts of Aboriginal communities to prioritise smoke-free norms, Victoria has seen a decline in tobacco smoking rates among Aboriginal Victorian communities. In 1994, 54.5% of Aboriginal Australians aged 18 or older were current smokers; in 2018–19, this had declined to 43.4%. There have also been improvements in recent years for Aboriginal mothers reporting smoking during pregnancy (from 50% in 2011 to 42% in 2021) (AIHW, 2022).

Despite this, there appears to have been no change to the gap in smoking prevalence between the Aboriginal adult population and non-Aboriginal population from 1994 to 2018–19, with rates remaining disproportionately high (AIHW, 2019).

With the increase of vaping, young people have become a new at-risk cohort, taking up vaping at a concerning rate and at significantly higher rates than other age groups (refer to data below).

Smoking and vaping during the COVID-19 pandemic

A snapshot of Australian smoking and vaping prevalence during the COVID-19 pandemic 2020–2021 found that (ABS, 2021; 2022):

- 10.7% of adults were daily smokers (2.1 million adults).
- 8.3% of adults aged 18 to 24 smoked daily, peaking at 13.7% among those aged 55 to 64, and dropping to 3.4% or adults aged 75 or older.
- More than 98.0% of 15- to 17-year-olds were non-smokers.
- Men were more likely to smoke daily than women (12.6% compared to 8.8%).
- Adults in fair or poor health were more likely to smoke daily (17.7%).
- Adults in outer regional and remote areas were almost twice as likely to smoke daily compared with those in major cities (17.9% compared to 9.3%).
- 9.3% of adults had used an e-cigarette, with 2.2% currently using one.
- Men (11.3%) were more likely than women (7.5%) to use e-cigarettes.
- Vaping prevalence was highest among 18- to 24-year-olds (4.8% currently using).
- Vaping prevalence was twice as high in those aged 18 to 44 compared with those aged 45 or older (3.2% compared to 1.5%).
- 7.6% of 15- to 17-year-olds had used an e-cigarette at least once.



The risks of smoking during pregnancy are discussed more in the 'Maternal and infant health' chapter.

Efforts to support tobacco and vape-free living

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

- funding for the Victorian Quitline, which provides counselling services, support and information to people to help them quit smoking and/or vaping, as well as funding anti-smoking and anti-vaping campaigns across television, radio, print and social media
- funding to VicHealth under the *Tobacco Act 1987* to undertake a range of health promotion activities including reducing harms from tobacco and e-cigarettes
- funding through the Community Health – Health Promotion program, which supports a number of priorities including reducing harm from smoking and vaping
- advocating, on behalf of the Victorian Government, for a nationally consistent approach to regulating e-cigarette products, with a focus on child safety
- enabling councils to identify local action to reduce smoking and vaping through municipal public health and wellbeing plans
- 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
- implementing amendments to the Tobacco Act, 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
- responding to queries in the dedicated tobacco email inbox and through the tobacco information line
- coordinating initiatives led by Aboriginal community health organisations aimed at reducing tobacco and e-cigarette related harms, in partnership with stakeholders including Tackling Indigenous Smoking workers, Quit Victoria, Cancer Council Victoria, VicHealth, Safer Care Victoria and local government
- work by Safer Care Victoria to reduce the risk factors for stillbirths, including encouraging smoking cessation.

Find out more about reforms and quitting smoking

For more information, visit the department's [tobacco reforms webpage](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>>.

For more information and support to quit smoking or nicotine addiction, visit the [Quit Victoria webpage](https://www.quit.org.au/) <<https://www.quit.org.au/>> or call them on 13 78 48.

For more information about tobacco and e-cigarettes visit:

- [Victorian Population Health Survey 2019](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>>
- [Victorian Population Health Survey 2020 – Dashboards](https://vahi.vic.gov.au/reports/population-health/victorian-population-health-survey-2020-dashboards) <<https://vahi.vic.gov.au/reports/population-health/victorian-population-health-survey-2020-dashboards>>
- [Tobacco in Australia](https://www.tobaccoinaustralia.org.au/home.aspx) <<https://www.tobaccoinaustralia.org.au/home.aspx>> (Cancer Council Victoria)
- [Smoking and tobacco](https://www.betterhealth.vic.gov.au/healthyliving/smoking-and-tobacco) <<https://www.betterhealth.vic.gov.au/healthyliving/smoking-and-tobacco>>
- [e-cigarettes](https://www.betterhealth.vic.gov.au/health/healthyliving/e-cigarettes) <<https://www.betterhealth.vic.gov.au/health/healthyliving/e-cigarettes>>
- [Talking about vaping with young people](https://adf.org.au/talking-about-drugs/vaping/vaping-youth/talking-about-vaping/) <<https://adf.org.au/talking-about-drugs/vaping/vaping-youth/talking-about-vaping/>> – [Alcohol and Drug Foundation](https://adf.org.au) <<https://adf.org.au>>
- [E-cigarettes and teens](https://www.rch.org.au/kidsinfo/fact_sheets/E-cigarettes_and_teens/) <https://www.rch.org.au/kidsinfo/fact_sheets/E-cigarettes_and_teens/>
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Maternal and infant health

The COVID-19 pandemic disrupted maternity care worldwide, with some developed countries reporting increases in stillbirth. Other countries reported decreases in preterm birth or no difference in outcomes. The pandemic also saw reductions in vaccination rates for some diseases.

Birth rates

Lower birth rates in Victoria were recorded in 2020 compared with 2019, but there was a subsequent increase in 2021 (Table 18).

Table 18: Victorian birth numbers as reported by the Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM)

Year	Babies born reported by CCOPMM
2019	78,954
2020	76,990
2021	81,434

Sources: CCOPMM, 2021; 2022; 2023

Preterm stillbirth and premature births during the pandemic

Numerous modifications to pregnancy care were rapidly adopted to mitigate the anticipated strain on health services and reduce infection risks. These included:

- a rapid transition to telehealth
- hospital visitor restrictions – including the number of support people in birth suites
- increasing the interval between in-person visits
- reducing face-to-face appointment time
- changes to gestational diabetes screening
- ultrasound surveillance of fetal growth.

Melbourne experienced relatively few maternal COVID-19 infections (less than 100 in 2020) and no associated maternal or perinatal deaths (CCOPMM, 2021).

The rapid transition to telehealth for the majority of pregnancy care led to half of all pregnancy consultations being by telehealth. This was achieved without compromising pregnancy outcomes for mother or baby (Palmer et al., 2021).

To investigate the effects of COVID-19, a retrospective, multicentre cohort study of perinatal outcomes in Melbourne before and during the COVID-19 restrictions was done using routinely collected maternity data on singleton pregnancies from all 12 public hospitals in metropolitan Melbourne (Hui et al., 2022).

While overall incidence remained low, the study showed an estimated one and half times increased odds of premature stillbirth during the pandemic. This appears to be related to a decrease in planned medical preterm births including planned medical preterm births due to concerns for fetal wellbeing.

A single-centre study described significant decreases in preterm birth associated with some of the periods of restrictions, although the broader study did not identify a significant change in preterm birth overall (Stansfield et al., 2022). Of interest, there was no change in spontaneous preterm birth.

Vaccination for pertussis and influenza in pregnancy

Pertussis (whooping cough) and influenza (flu) are dangerous infections for pregnant women and their newborn babies. Vaccination in pregnancy significantly reduces the chance of severe influenza infection for the mother and severe pertussis infection in the first 6 months of life for the newborn. Maternal vaccination is also associated with reduced rates of preterm birth and stillbirth, though the mechanisms of this protective effect remain unknown (Giles et al, 2021).

Pertussis and influenza vaccines are strongly recommended, and are free, for all pregnant women in Victoria under the [National Immunisation Program](https://www.health.gov.au/topics/immunisation) <<https://www.health.gov.au/topics/immunisation>>. This is currently the most effective method to protect mothers and babies from these infections and may reduce risks of preterm birth and stillbirth.

In 2021 there was a reduction in pertussis and influenza vaccination in pregnant women, as shown in Figures 16 and 17 (Safer Care Victoria, 2024).

Figure 16: Percentage of Victorian women vaccinated for pertussis (whooping cough) during pregnancy, 2017-2021, by public and private hospital and statewide

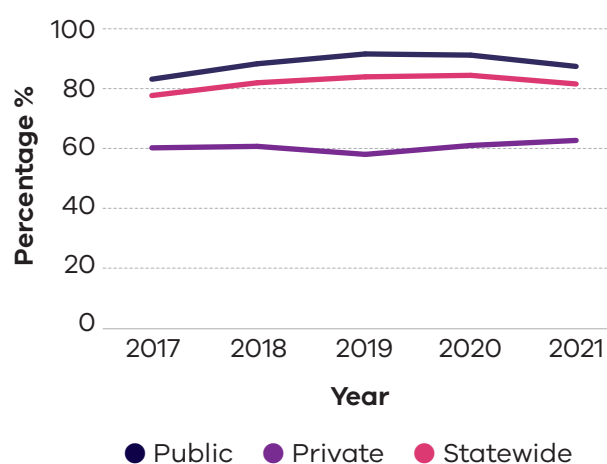
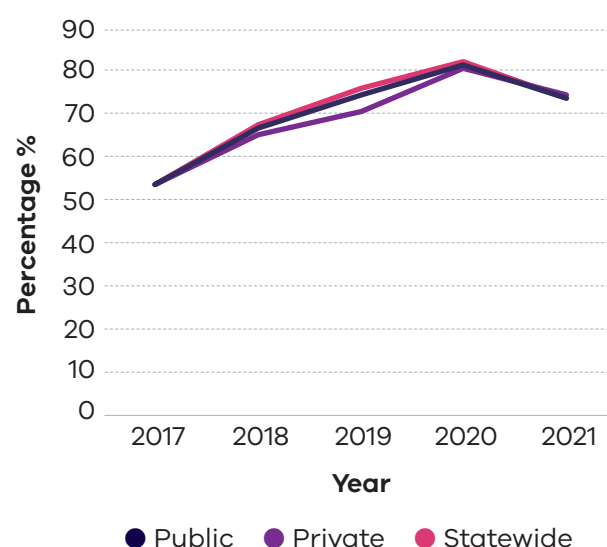


Figure 17: Percentage of Victorian women vaccinated for influenza during pregnancy, 2017-2021, by public and private hospital and statewide



More information is on the [Sharing Knowledge About Immunisation webpage](https://skai.org.au/pregnancy-and-newborn/resources/factsheets) <<https://skai.org.au/pregnancy-and-newborn/resources/factsheets>> or the department's [Immunisation webpage](https://www.health.vic.gov.au/publichealth/immunisation) <<https://www.health.vic.gov.au/publichealth/immunisation>>.

Smoking in pregnancy

Health services track how many pregnant women attending antenatal clinics smoke and how many women stop smoking while they are pregnant, after being provided advice and support. Smoking rates in pregnant women are reported annually. In 2021, 7.2% of Victorian women smoked at some time during their pregnancy, slightly less than in previous years. We want to make sure rates continue to fall (CCOPMM, 2023).

Smoking is associated with poorer health outcomes for pregnant women and their babies. Smoking during pregnancy is strongly associated with stillbirth and the risk that babies are born small for gestational age or born early. Quitting at any time during pregnancy can reduce the risk of harm to babies. A number of services offer support for smoking or vaping cessation, including during pregnancy.

These include:

- [Quitline](https://www.quit.org.au/) <https://www.quit.org.au/> or 13 78 48
- [iSISTAQUIT](https://isistaquit.org.au/) <https://isistaquit.org.au/>
- [Stillbirth Centre of Research Excellence](https://saferbaby.org.au/preventative-steps/quit-smoking-for-baby/) <https://saferbaby.org.au/preventative-steps/quit-smoking-for-baby/>.

Vaping and the use of e-cigarettes is increasing in Australia, and it is likely that this is still harmful in pregnancy (Rice et al., 2024). The outcome of current research studies is eagerly awaited.

Breastfeeding

The World Health Organization recommends exclusively breastfeeding babies aged under 6 months and to continue breastfeeding until 2 years.

Many new mothers need support to breastfeed after they are discharged from hospital because establishing breastfeeding takes time, patience and practice. The [Australian Breastfeeding Association website](https://www.breastfeeding.asn.au/) <https://www.breastfeeding.asn.au/> is a useful resource.

The rates of women with term babies who initiate breastfeeding has been consistent over time, yet, in 2021, 30% of term breastfed babies were given infant formula in hospital (Safer Care Victoria, 2024). New mothers can be supported to breastfeed, with:

- early skin-to-skin contact immediately after birth
- feeding within an hour of birth
- being in the right environment with the right support from midwives and breastfeeding specialists.

Victorian hospitals strive to have up-to-date evidence-based policies and practices that align with the [Baby Friendly Health Initiative](https://bfhi.org.au/) <https://bfhi.org.au/>. Hospitals should ensure infant formula use is limited to those babies who have a clear medical indication.

Improving health outcomes for Aboriginal women and babies

Aboriginal maternal and child health

Aboriginal women and babies often experience poorer outcomes than non-Aboriginal women and babies.

In 2020, 1,134 Aboriginal women gave birth to 1,151 babies (1.5% of all women who gave birth and 1.5% of all babies born in Victoria):

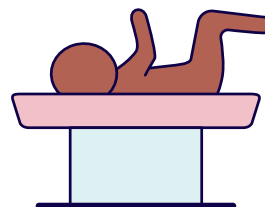
- 13.4% of babies born to Aboriginal women were born before 37 weeks' gestation, compared with 7.8% of those born to non-Aboriginal women.
- 10.9% of babies born to Aboriginal women had a birthweight below the 10th percentile compared with 8.4% of those born to non-Aboriginal women (CCOPMM, 2022).

In 2021, 1,250 Aboriginal women gave birth to 1,271 babies (1.6% of all women who gave birth and 1.6% of all babies born in Victoria):

- 12.2% of babies born to Aboriginal women were born before 37 weeks' gestation compared with 7.6% of those born to non-Aboriginal women.
- 11.8% of babies born to Aboriginal women had a birthweight below the 10th centile compared with 8.7% of those born to non-Aboriginal women (CCOPMM, 2023).



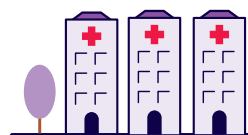
**In 2021,
12.2%
of babies born to
Aboriginal women
were born before
37 weeks' gestation**



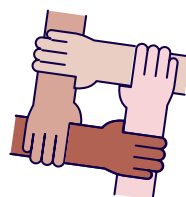
**In 2021,
11.8%
of babies born to
Aboriginal women
had a birthweight
below the 10th centile**

Aboriginal led service delivery

Koori Maternity Services



**3 public
hospitals**



**11 Aboriginal
Community
Controlled
Organisations**

Three public hospitals and 11 Aboriginal Community Controlled Organisations provide Koori Maternity Services. These services aim to ensure Aboriginal women and families receive culturally safe and high-quality pregnancy care, with the following outcomes:

- More Aboriginal women access antenatal care earlier in their pregnancy.
- Fewer Aboriginal women smoke during pregnancy.
- Fewer Aboriginal babies are born early.
- Fewer Aboriginal babies die during pregnancy or soon after birth.

Maternal and infant health – chapter references

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Child health

Child health – chapter overview

Childhood is a critical stage of life. Healthy habits during childhood provide a foundation for positive future wellbeing.

This section of the Chief Health Officer report examines child health in Victoria. It references the 2020 *The state of Victoria's children* report and the 2021 Victorian Child Health and Wellbeing Survey, both published by Victoria's Department of Education.

Mental health and wellbeing

The World Health Organization defines mental health as a state of wellbeing where a person has the capacity to overcome the stresses of life, can work in a productive manner and contribute positively to their community. Mental health is key part of overall wellbeing and health. Reduced mental health can have a negative influence on the potential of young people to live productive and fulfilling lives (WHO, 2022).

Although the COVID-19 pandemic affected Australians and Victorians in different ways, the social impacts on a number of Australians have been substantial. Research indicates that unfavourable life events and accompanied change and unpredictability, can have a significant impact on the wellbeing of younger people (Department of Education, 2020). Indeed, some children and young people suffered as a result of restrictions, but there were also positive outcomes for others (Department of Education, 2020).

Prior to the pandemic, children's mobility, independent travel and outdoor play in Australian cities was limited and declining. Public health protection measures put into place during the pandemic affected the lives of Victorian children and young people considerably in 2020, particularly the move to learning from home and public health directions. However, the COVID-19 restrictions reduced traffic and encouraged some to use more active transport, such as walking and cycling (Department of Education, 2020). In some cases, children spent more time playing outdoors in their local neighbourhood and engaged with their local communities in new ways, like decorating footpaths with chalk drawings. Opportunities such as a supportive family environment, physical exercise and creative outlets, social connectedness and routine act as protective factors contributing to good mental health in children (Wille et al., 2008).

The 2020 *The state of Victoria's children* report found that children aged 1 to 5 in metropolitan Melbourne who experienced Victoria's 'stage 4' restrictions were 2 to 5 times more likely to score in the 'high to very high range' for anger, symptoms of anxiety, depression or sleep disturbance as compared with children who did not have this experience. The parents and/or caregivers of these children had significantly more concerns about their children's mental health compared with those in other jurisdictions that did not experience a second wave of the pandemic and associated public health measures (Department of Education, 2020).

The physical and mental health of school-aged children was a major focus of public health responses during 2020, with governments trying to balance developmental needs with controlling COVID-19 case numbers. It was found that most students had mixed experiences of learning from home: 78% of students who responded to a survey said their lives had been positively affected by COVID-19 to some degree, while 89% said their lives had been negatively affected to some degree (Department of Education, 2020). Furthermore, the Learning From Home Survey conducted between May and June 2020 reported that some students enjoyed the increased opportunities of working at their own pace and rest when needed. They also reported more time with their immediate family and a lack of distractions as positives while learning from home. Others struggled with not seeing their peers and found it difficult to maintain focus at home (Learning First, 2020).

While some young people had positive experiences during this time, evidence indicates serious mental health effects for others. A sharp increase was observed in 2020 with children and young people presenting to acute health services and emergency departments with mental health concerns comprising of eating disorders, self-harm and attempted suicide (Department of Health, 2021). Rates of psychological distress among young Victorians also increased significantly between 2017 (8%) and 2020 (11%), attributable at least in part to the pandemic. Reports of mental health concerns were higher for young women than for young men (Biddle et al., 2020; Department of Education, 2020).

The Victorian Government provided support to those experiencing poor mental health. The Mental Health and Wellbeing Coronavirus Response Package was announced in April 2020 to increase surge capacity for key services and assist people living with a mental illness – including those experiencing mental health problems for the first time due to the pandemic — as well as their carers and families.

This package also included services available to assist children, young people and their families including:

- online and phone counselling services via Kids Helpline
- fast tracking Orygen Youth Health's new eOrygen platform for online therapy and peer support for young people
- digital resources to help parents manage anxiety and promote emotional wellbeing (Department of Education, 2020).

Find out more about child mental health and wellbeing

For more information, visit the Department of Education's [The state of Victoria's children report](https://www.vic.gov.au/state-victorias-children-report) <<https://www.vic.gov.au/state-victorias-children-report>>.

Obesity and overweight

A healthy bodyweight is vital for young people's current and future health (AIHW, 2021a).

Currently, childhood overweight and obesity is a major public health issue in Australia.

The Australian Bureau of Statistics in 2017–18 found that 1 in 4 (25%) children and adolescents aged 2 to 17 were overweight or obese (AIHW, 2020).

Being overweight or obese increases a young person's risk of poor physical health, increasing the likelihood for future illness and mortality in adulthood. Overweight and obesity is generally caused by an energy imbalance, where too much energy is consumed through food and drink, and insufficient energy is expended via physical activity (AIHW, 2022). There are many different interconnected factors and behaviours that drive this imbalance. Some of these include (AIHW, 2024a):

- genetics/physiology (for example, metabolism, appetite, satiety and body fat distribution)
- health inequalities (for example, area of remoteness, socioeconomic disadvantage, ethnic/cultural groups)
- environmental factors (for example, availability of fast-food outlets, portion sizes, home and neighbourhood environments)
- societal factors (for example, media and advertising, retail environments).

These factors vary but ultimately increase the likelihood of unhealthy weight in children, making overweight and obesity complex to address (AIHW, 2021b).

As with other health and wellbeing conditions, some children and adolescents from disadvantaged areas are more likely to be overweight and obese. As seen in the 2017–2018 financial year, 2–17 years olds from disadvantaged areas were more than twice as likely to be obese than children living in advantaged areas (AIHW, 2020)

Evidence suggests that the COVID-19 pandemic changed the health-related behaviours of Victorian children and young people. Public health restrictions limited or meant the cancellation of organised sport for many children and young people in 2020, often leading to more time spent watching screens and using electronic devices, for both education and leisure (Department of Education, 2020).

In 2020 Victorian parents reported that their children were exercising less than before the pandemic, particularly those aged 5 to 11 years (52% exercising less than before) and those aged 12 to 17 (47% exercising less) (Department of Education, 2020).

Similarly in 2021, the Victorian Child Health and Wellbeing Survey reported that less than half of children (47.3%) aged 5 to 12 years were physically active for more than an hour or more every day. This represents a decrease from 2019 (51.8%) when the survey was conducted and indicates a continued pattern of decline in physical activity since 2013 (Department of Education and Training, 2023).

Physical activity and exercise are pivotal means by which the body expends energy. Being active promotes health and wellbeing while helping prevent chronic conditions such as cardiovascular disease, type 2 diabetes and overweight or obesity (AIHW, 2024b).

In 2021 only 2.9% (approximately 1 in 33) of Victorian children ate the recommended amount of vegetables, regardless of age or level of disadvantage. This was similar to previous years, such as that seen in 2019, with approximately 2.5% (1 in 40 children) eating the recommended amount of vegetables (Department of Education and Training, 2023).

Only 72% of Victorian children met the national minimum guidelines for fruit consumption, which was similar to previous years. Children living with 2 parents or caregivers and those who were not registered on a health care card were more likely to consume enough fruit under the dietary guidelines when compared with other areas (Department of Education and Training, 2023).

Managing good nutrition is important for healthy development and growth in children. Developing these positive habits during this critical stage of life helps ensure positive eating habits carry onto adulthood (AIHW, 2021c).

Allergies

Allergies are among the fastest growing chronic conditions in Australia, with 1 in 5 Australians reported to experience allergic rhinitis or hay fever, and more than 1 in 10 Australians reported to experience other allergies (ABS, 2022). In children, 13% experienced allergic rhinitis or hay fever, and 10% experienced other allergies (ABS, 2022).

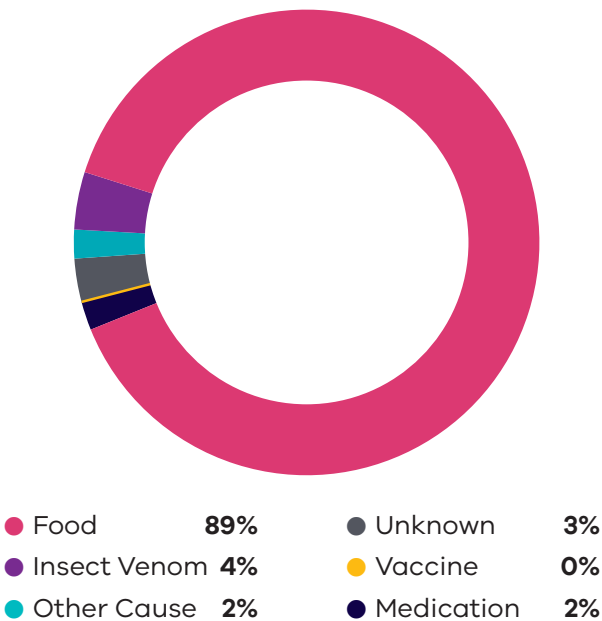
According to the Royal Children's Hospital Melbourne, the most common causes of allergies in children are food with eggs, peanut, tree nuts, cow's milk, soy, wheat, fish, shellfish and sesame. Other common allergies include insect bites, latex and some medications such as antibiotics or anaesthetics (Royal Children's Hospital, 2021) (Figure 18).

Many allergic reactions are mild, but some can be extremely severe. 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. These chemicals can send people into shock, dropping their blood pressure, narrowing their airways and affecting their ability to breathe. Food, insect venom and medication are the 3 main causes of anaphylaxis in children (Royal Children's Hospital, 2021).

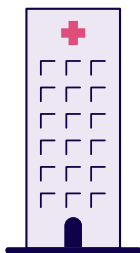
Since 1 November 2018 Victorian public and private hospitals have had to notify the department of all anaphylaxis presentations as a part of an amendment to the *Public Health and Wellbeing Act 2008*. These notifications need to be submitted immediately if the suspected cause of anaphylaxis is from packaged food, and within 5 days for all other causes (Department of Health, 2023).

Figure 18: Proportion of notified child cases of anaphylaxis by suspected cause, 2020–2021



In 2020 the department received 1,768 notifications of anaphylaxis presentations to hospital emergency departments, of which 40% were in children. The number was similar for 2021 with 2,145 cases notified, of which 37% were in children (Figure 19, Table 19). For both years it was more common for male children to present to an emergency department for anaphylaxis than it was for female children, with 59% of cases in 2020 and 57% in 2021 being males.

In 2020, the department received

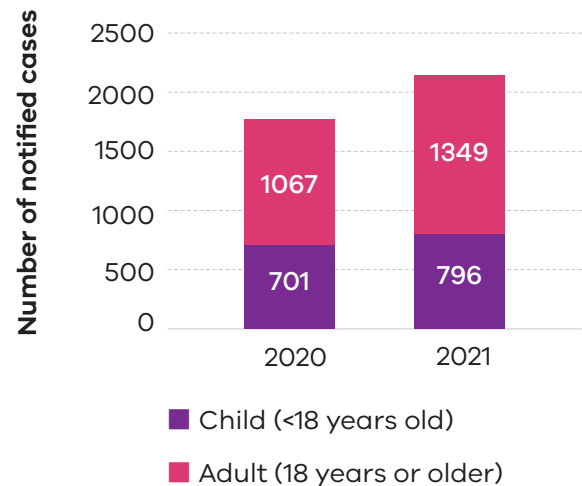


1,768
notifications of anaphylaxis presentations to hospital emergency departments. 40% of those cases were in children

Table 19: Total number of notified children and adult cases of anaphylaxis, 2020–2021

Year	Child (<18 years old)	Adult (18 years or older)	Total
2020	701	1067	1,768
2021	796	1349	2,145

Figure 19: Number and portion of notified children and adult cases of anaphylaxis, 2020–2021



Food allergy is typically the most common cause of anaphylaxis in children. We saw this in 2020 and 2021, with 88% and 87% of cases respectively due to food allergies.



The anaphylaxis notification system is discussed more in the 'Food' chapter.

Child health – chapter references

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Environmental health

Environmental health – chapter overview

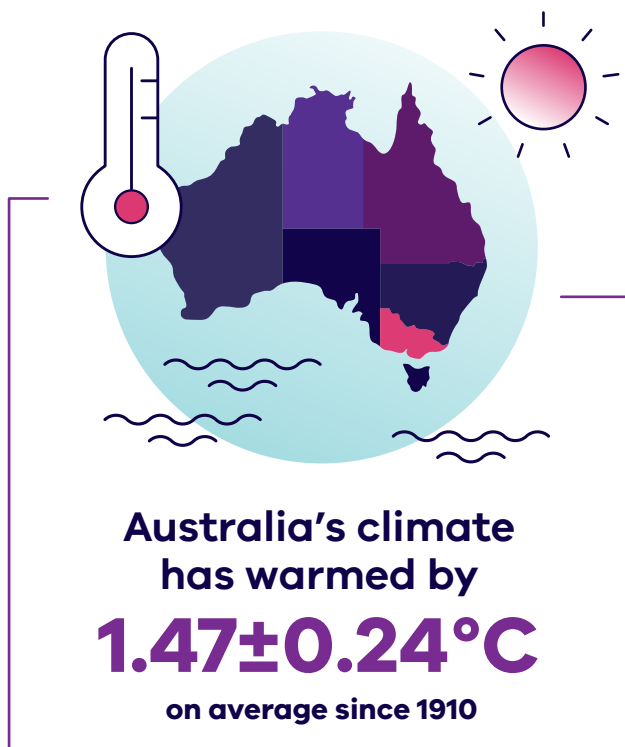
Environmental health focuses on reducing exposures to environmental factors that cause disease and creating environments that are good for human health.

The health of individuals, communities and populations is linked to physical, chemical, biological and social factors. Environmental health is a public health discipline that aims to achieve the best possible outcomes for public health through assessing and managing those physical, chemical, biological and social factors.

With that in mind, this section of *Your Health: Report of the Chief Health Officer, Victoria, 2020 and 2021* focuses on climate change and extreme weather events, ambient (outdoor) air quality, indoor air quality and heat health.

Climate change and extreme weather events

The World Health Organization refers to climate change as ‘the defining issue for public health in the 21st century’ (WHO, 2016). Victoria’s climate is already changing and impacting the health and wellbeing of Victorians, with current climate trends projected to continue (Department of Health and Human Services, 2019).



Australia's climate has warmed by $1.47 \pm 0.24^{\circ}\text{C}$ on average since 1910 (Bureau of Meteorology and CSIRO, 2022). Changes to Australia's climate have led to larger and more frequent fires, especially in southern Australia, an increase in extreme heat events, and an increase in the intensity of heavy rainfall events (and associated flooding), among a range of other changes (Bureau of Meteorology and CSIRO, 2022).

Victoria experienced several extreme events in 2020 and 2021 including the devastating eastern Victorian bushfires that began in late 2019 and continued until 2020 and severe storms and flooding that occurred in June, October and November 2021 (State Government of Victoria, 2022).

Health and wellbeing impacts associated with the 2019–2020 bushfires have been detailed in a number of publications, including *Your health: Report of the Chief Health Officer, Victoria, 2019*. It is estimated that climate change accounted for at least a 30% increase in the risk of fire weather associated with the 2019–2020 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).

Between 7 and 11 June 2021, many areas around Victoria, particularly in the south-east, flooded and experienced strong winds, with these areas receiving more than 100 mm of rain in 24 hours. There was extensive damage to homes and critical infrastructure (State Government of Victoria, 2024), with 2 drowning deaths related to floodwater – one in the Gippsland region and the other near Warrnambool. The operations of the Yallourn Power Station were also affected in addition to trees and powerlines toppling around the state. This led to more than 336,000 homes and businesses losing power, with some not reconnected for nearly a month.

There was loss of mains power to 6 drinking water treatment plants, leading to an advisory notice not to drink tap water in several locations.

Seventeen health services operated on back-up generators for a short period, and some testing and vaccination sites were affected (National Emergency Management Agency and Australian Institute for Disaster Resilience, 2021).

Another severe storm and flooding event occurred between 28 October and 8 November 2021, affecting communities across Victoria (National Emergency Management Agency and Australian Institute for Disaster Resilience, 2022). This caused the single most widespread electricity outage experienced in Victoria (DELWP, 2022), with more than 750,000 customers losing power (DEECA, 2022). The 2021 June and October storms and floods collectively affected 3.3 million hectares across Victoria (DELWP, 2022).

Floods and Victoria's changing climate

Flooding is a major hazard affecting Australia. The risk of flooding is influenced by a range of large-scale climate drivers and weather-related factors including the intensity of rainfall events and the extent to which catchments already contain water before rainfall events. Flood risk also has the potential to change over time because of factors such as land cover and land use changes. Due to these elements, the amount of rainfall, location and timing of events is highly variable, year on year and across decades (Bureau of Meteorology and CSIRO, 2022).

While climate projections indicate Victoria is likely to receive less overall total rainfall in the future, individual extreme rainfall events are projected to increase. The 2019 Victorian Climate Projections estimate with high confidence that extreme rainfall events will become more intense by the end of the century, with greater risks of flash flooding. But where and when these events will occur remains highly variable (Bureau of Meteorology and CSIRO, 2022).

Extreme rainfall days are when the rainfall total for that 24-hour period exceeds the 90th percentile and often leads to flooding. Long-term trends show Victoria is receiving less rainfall than previously. However, extreme rainfall events are making up a larger proportion of total rainfall and are becoming more intense, likely due to a combination of warmer sea-surface temperatures and increased atmospheric water-holding capacity.

With these events projected to intensify further, floods such as those that occurred in June and October 2021 are expected to occur at a greater rate and severity (Bureau of Meteorology and CSIRO, 2022). And with this there is a propensity for flood events to further increase existing public health risks and impacts.

During and in the aftermath of severe rainfall events, injuries are also more likely to occur, including from contact with debris, drowning, bites from displaced animals or insects and transport-related accidents. Hospitalisations from storm-related injuries across Australia in 2021–22 were nearly twice the yearly average over the preceding 9 years (AIHW, 2023).

Beyond direct injuries, the risk of infections such as acute gastroenteritis and respiratory tract infections also increases after floodwater exposure (Kontowicz et al., 2022; Mulder et al., 2019). This is most likely due to contamination or the disruption to essential services such as electricity, water and sewerage.

The mental health impacts associated with flood events can also be significant and long-lasting, particularly for those whose home or business is inundated (Cruz et al., 2020; Fitzgerald et al., 2020; Matthews et al., 2019). Mental health impacts can also be exacerbated by the loss of loved ones, displacement and disruptions of communities, goods and services.

Find out more about environmental health

For more information on actions the department is taking to tackle climate change and its impacts on health, visit:

the department's [climate change and health webpage](https://www.health.vic.gov.au/environmental-health/climate-change-and-health) <<https://www.health.vic.gov.au/environmental-health/climate-change-and-health>>

the Better Health Channel's [climate change and health page](https://www.betterhealth.vic.gov.au/health/healthyliving/climate-change-and-health) <<https://www.betterhealth.vic.gov.au/health/healthyliving/climate-change-and-health>>.

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.

Effects of air pollution on health

People sensitive to air pollution include those with heart or lung conditions such as asthma, people over the age of 65, infants and young children, pregnant women and people with diabetes.

Air pollution can cause symptoms immediately upon exposure. Those symptoms include coughing, watering eyes, difficulty breathing and tightness or pain in the chest.



1.3%
of the total disease
burden in Australia
was due to air pollution

Long-term exposure can, over time, affect health or worsen medical conditions (EPA Victoria, 2018). Air pollution has been linked to allergies, asthma, lung disease, heart disease and some cancer. The Australian Institute of Health and Welfare reported that, in 2018, 1.3% of the total disease burden in Australia was due to air pollution and that air pollution was causally linked to 6 diseases – coronary heart disease, chronic obstructive pulmonary disease, stroke, type 2 diabetes mellitus, lung cancer and lower respiratory tract infections (AIHW, 2021a).

Air pollution was responsible for 8.6% of coronary heart disease total burden, 8.3% of stroke burden, 6.7% of both chronic obstructive pulmonary disease and type 2 diabetes burden, 5.7% of lower respiratory infections burden and 3.4% of lung cancer burden (AIHW, 2021a).

Causes of poor air quality

A range of natural and human sources of air pollution can affect air quality.

Primary air pollutants – in the form of particles and gases – 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:

- PM₁₀ (particles of 10 micrometres or smaller) in wind-blown dust from storms, unpaved roads, earth works and mineral mining
- PM_{2.5} (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

The Environment Protection Authority Victoria has been measuring Melbourne's air quality since 1973 and since then, air quality has continued to improve. EPA Victoria has a key role in reducing emissions that mainly come from industry, vehicles and wood burning that lead to air pollution.

EPA Victoria monitors air quality by measuring several common pollutants such as particulates (PM₁₀ and PM_{2.5}), ozone and nitrogen dioxide across Victoria and reports the level of pollutants in the air at several monitoring sites across Victoria. Local air quality can be checked using [EPA AirWatch](https://www.epa.vic.gov.au/) <<https://www.epa.vic.gov.au/>>.

Victoria's air quality was generally good in 2020 and 2021. However, there were periods of worsened air quality, due mostly to smoke and urban pollution. Some periods of poor air quality were due to elevated levels of PM₁₀ and PM_{2.5}. Overall, however, pollutant levels for carbon monoxide, nitrogen dioxide, ozone and sulphur dioxide were below the national ambient air quality standards in 2021 (EPA Victoria, 2023).

Highlights from *Air pollution in Victoria – a summary of the state of knowledge* (EPA Victoria, 2018), as well as the *Air monitoring report 2021* (EPA Victoria, 2023), are provided below for PM₁₀ particles, PM_{2.5} fine particles and ozone.

PM₁₀ particles

The medium-term trends for air quality for PM₁₀ are improving, with 2020 and 2021 seeing reductions in some pollutants due to a strong La Niña pattern. La Niña conditions generally result in above average rainfall over much of Australia, which can reduce the amount of dust and particles. However, there is a long-term danger of worsening air quality because of more frequent and extensive dry conditions and bushfires (EPA Victoria, 2018).

Major bushfires, planned burns and the Millennium drought of 1997–2010 contributed heavily to the higher levels of PM₁₀ (coarse) particles recorded in Melbourne between 2003 and 2009. Since then, the number of PM₁₀ exceedance days has decreased, excluding Brooklyn (which is influenced by localised sources of dust).

In 2021 the number of exceedances at many air monitoring stations reduced. The PM₁₀ particle 24-hour standard was exceeded on 3 days, attributed to wind-blown dust. This was strongly associated with La Niña weather patterns that began in the spring of 2020 (Australian Research Council Centre of Excellence for Climate Extremes, 2022).

PM_{2.5} fine particles

Since 2021 the number of days in Melbourne that exceeded the PM_{2.5} fine particle 24-hour standard has decreased compared with earlier years.

In 2021 the PM_{2.5} fine particle 24-hour standard was exceeded for 4 days in the greater Melbourne region and 2 days in the Latrobe Valley. These days were attributable to fuel reduction burns.

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 1998) show the ozone concentrations at Melbourne's Alphington and Footscray air-monitoring stations have decreased.

The trend for 2020 and 2021 as shown in Figures 20 and 21 also show the annual average ozone concentrations are trending downwards.

The longer term trend between 1979 and 2021, however, is upwards. This may be due to hotter, drier conditions, which increase the likelihood of ozone formation.

Years where there are major bushfires typically have higher peak ozone concentrations, and this includes 2020, 2019, 2014, 2009, 2007 and 2006.

Figure 20: Ozone levels in the metropolitan Melbourne suburb of Alphington

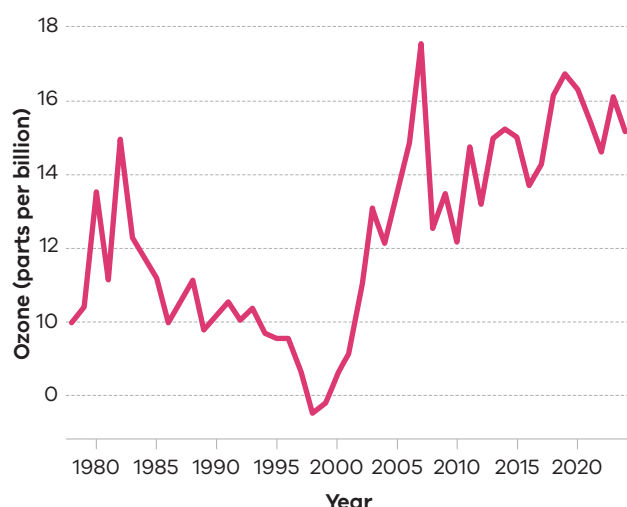
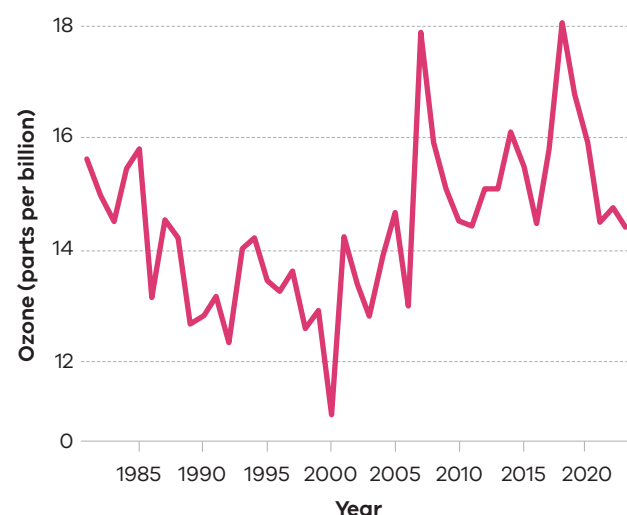


Figure 21: Ozone levels in the metropolitan Melbourne suburb of Footscray



2019–2020 bushfires

Major bushfires burned across south-eastern Australia over the 2019–2020 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.

In 2019–2020, there were a number of days the PM₁₀ and PM_{2.5} standards were exceeded, mostly due to summer bushfires.

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

A preliminary evaluation of the health burden of the extensive bushfires in Victoria during the summer of 2019–2020 estimated that bushfire smoke was associated with 120 excess deaths, 331 hospitalisations for cardiovascular problems, 585 hospitalisations for respiratory problems and 401 emergency department presentations for asthma (Commissioner for Environmental Sustainability, 2023).

2020–2022 air quality changes associated with the pandemic period

The EPA analysed air quality data collected during the COVID-19 restrictions and compared it with road traffic data from the Department of Transport and Planning. The analysis showed a non-seasonal decrease in levels of several pollutants. Concentrations increased as restrictions were relaxed (Choi et al., 2021). These changes in air pollution were consistent with observations and analysis carried out internationally (Sokhi et al., 2021).

The results of these studies show the potential reductions in air pollution that could be achieved with greater adoption of low emission technologies.

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.

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).

Climate change is affecting air quality by altering the meteorological variables that influence the development, chemical transformation, dispersion and deposition of air pollutants.

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 affect the type and scale of exposure to air pollution.

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

Find out more about air quality

For more information on air quality, visit 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

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

The decisions made early on when buying or building a home can affect the liveability of a home for decades to come. These choices can support the home environment to be liveable and adaptable to the changing needs so it remains comfortable, efficient and cost-effective in the long term (Your Home, 2024).

Poor air quality can cause health problems. Victorians spend a lot of time inside their homes, so it is important to ensure good indoor air quality by finding ways to prevent or limit air pollutants and by ventilating our homes.

Housing a growing population

By 2051 Victoria's population is projected to increase to 10.3 million people. This increase in population will result from a population increase of 1.06 million people and net migration of 2.47 million people (Department of Transport and Planning, 2023).

Population growth increases the demand for housing. Improving housing conditions and reducing health risks in our homes is essential for protecting public health and maintaining wellbeing (WHO, 2018).

Housing affordability and accessibility is also connected to wellbeing.

Guidelines on housing and health

The World Health Organization (2018) strongly recommends that countries consider strategies for:

- preventing or reducing household crowding
- increasing accessibility for people with functional impairments
- improving home safety
- avoiding injuries.

These guidelines 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 tends to be energy inefficient for cooking, heating and cooling, creating health risks for residents and increasing climate emissions (WHO, 2019).

With the increased threat of smoke from landscape fires under a hotter, drier climate, residential buildings also have to function as refuges from intermittent air pollution episodes. This warrants housing standards that enable residents to effectively prevent the admission of outside air during bushfires and controlled burns.

Housing and health risks

Poor housing is a risk factor for reduced brain development in children. It is associated with many health conditions including respiratory and cardiovascular diseases, infectious diseases, infections and injuries (WHO, 2018). Healthy homes should be safe and free of environmental threats including:

- noise pollution
- indoor air pollution (for example, cigarette or e-cigarette smoke)
- being structurally unsound or unsafe
- a lack of green spaces
- overcrowding
- a lack of access to water and sanitation

- a lack of access to cycling lanes and walking paths
- faulty home appliances and household products
- ambient air pollution
- extreme indoor temperatures (heat and cold).

Time spent indoors

Research shows that:

- Australians spend 90% of their time indoors (at work, school, in shopping centres and at home) (Department of Climate Change, Energy, the Environment and Water, 2021).
- 42% of women and 22% of men spend more than 80% of their time at home.
- Time spent indoors increases with age (enHealth, 2012).

Indoor air quality

The National Health and Medical Research Council 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.

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).

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
- are managed through occupational health and safety legislation for workers in workplaces
- are generally regulated by manufacturing design, compliance with instructions for use (including maintenance and consumer legislation) from household appliances
- are minimised by following safe use instructions on the product label from use of consumer products
- 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 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 Bureau of Meteorology and CSIRO 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 (Bureau of Meteorology and CSIRO, 2022).

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 PM₁₀ particles, ozone and fungi concentrations were higher outdoors.

In homes using gas appliances for cooking, levels of carbon dioxide, carbon monoxide, nitrogen dioxide, PM_{2.5}, formaldehyde, benzene and total volatile organic compounds were higher than in households that only used electric cooking appliances. Fitting homes with high-efficiency rangehoods to vent gas combustion products outdoors significantly reduces the exposure to these emissions and reduces the effects of asthma (Knibbs et al., 2018).

The Victorian Government's Energy Efficiency in Social Housing Program has invested \$112 million since 2020 for energy efficiency upgrades to public, community and Aboriginal housing homes (Homes Victoria, 2024). This program included replacing gas appliances with energy efficient electric appliances, including air conditioners for heating and cooling, and electric ovens and cooktops, to improve indoor air quality and benefit health.

Homes located close to busy roads were also 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 the department define a heatwave as a period of 3 or more consecutive days of extreme heat, which is a period of unusually hot maximum and minimum temperatures.

Heat health and Australia's changing climate

Australia's climate has warmed by $1.47 \pm 0.24^{\circ}\text{C}$ on average since national records began in 1910 (Bureau of Meteorology and CSIRO, 2022). Australia has also experienced an overall increase in the frequency of extreme heat events.

Australia is projected to experience continued warming in the future, with a greater number of extremely hot days (Bureau of Meteorology and CSIRO, 2022)

COVID-19 considerations

From 2020–21 Victoria experienced concurrent emergencies. These required the impacts and public health directions for COVID-19 to be embedded into the emergency management response arrangements. This included the management of extreme heat and heatwaves. This added another level of complexity for preparing for and responding to extreme heat events.

Key considerations included the following:

- People most at risk of heat-related health problems from exposure to heat are often those who are also most at risk of serious illness from COVID-19.
- Community behaviour changed during the pandemic and, as a result, during extreme heat events.

- During the pandemic, many Victorians needed to, or chose to, spend more time at home. This had a direct impact on the options available for them to choose alternative cooling strategies such as visiting a shopping centre if air conditioning was not available in their home. Potential loss of income may have seen many Victorians experiencing financial hardships and choosing not to turn on their air conditioners.
- For those able to move about, public health directions reduced the accessibility of public cool spaces for those seeking respite from the heat. People able to leave their homes often had to wear masks, making it difficult for their bodies to cool down in heat events. For those needing extra personal protective equipment, staying cool and hydrated was paramount.
- In response, the heat health messaging was adapted to reflect the restrictions in place at the time of the forecast or actual heat event.
- Local, regional and state organisations had to reconsider their preparedness and response to heat events in light of the public health orders for the pandemic. This was especially true for organisations that provided services to those most at risk in heat events or for those managing disruptions to essential services.

People most at risk of exposure to extreme heat

Anyone can be affected by extreme heat. Those most at risk include:

- people aged over 65 years
- babies and young children
- [pregnant women](https://www.betterhealth.vic.gov.au/healthyliving/pregnancy) <<https://www.betterhealth.vic.gov.au/healthyliving/pregnancy>>
- people who have existing medical conditions, such as [cardiovascular disease](https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/heart-disease-risk-factors) <<https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/heart-disease-risk-factors>>, [kidney disease](https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/kidney-disease) <<https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/kidney-disease>>, [diabetes](https://www.betterhealth.vic.gov.au/conditionsandtreatments/diabetes) <<https://www.betterhealth.vic.gov.au/conditionsandtreatments/diabetes>> or [mental illness](https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/mental-illness) <<https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/mental-illness>>
- people on certain medications, including diuretics (fluid tablets), beta-blockers, drugs with anticholinergic properties, and central nervous system stimulants
- people who work or exercise outdoors
- people who are socially isolated or living alone because there may not be someone to support or check in with them during extreme heat
- people with limited ways to keep cool, such as air conditioning, including people living in buildings that heat up easily and people experiencing homelessness.

Health impacts

Extreme heat can have a significant impact on health and may exacerbate pre-existing medical conditions. Heat-related health problems include:

- dehydration
- heat cramps
- heat exhaustion
- heat stroke
- cardiovascular event (heart attack)
- cerebrovascular event (stroke)
- kidney injury or kidney failure
- exacerbation of asthma and other respiratory illnesses (especially in the presence of pollution/smoke).

Heatstroke is a medical emergency that can result in permanent damage to vital organs or even death if not treated immediately (Better Health Channel, 2023).

Other health impacts due to exposure to extreme heat include:

- increased symptoms of mental health issues in those with mental health conditions
- increased risk of drowning (as people flock to waterways to cool down)
- increased incidence of foodborne gastroenteritis associated with higher ambient temperatures.

Extreme heat is also associated with other environmental hazards that can affect health, notably bushfires and the flow-on effects of consequences from heat such as disruptions to power, transport and water.

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 (Department of Health 2009; 2014).

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

Protective measures

Tips to stay healthy in extreme heat include:

- **Keep cool:** Use air conditioning or a fan, wear light and loose-fitting clothing. Keep your skin wet using a spray bottle or damp sponge and by taking cool showers.
- **Stay hydrated:** During days of extreme heat, drink water before you feel thirsty, especially if outdoors or performing physical activity.
- **Plan ahead:** Cancel or reschedule activities for the coolest part of the day. Avoid exercising and being outdoors in the heat. Prepare for power failure.
- **Check in with others:** Let family, friends and neighbours know you are OK. Or check in with those at increased risk or who may need your support during days of extreme heat.
- **Monitor the weather forecast.**

You can also be sun smart and protect yourself outside ('slip, slop, slap' to cover the skin, 'seek' shade and 'slide' on sunglasses).

Extreme heat days in Victoria

From 2020–21 onwards, the Chief Health Officer issued a heat health alert when the heat health temperature threshold was reached or exceeded for a specific weather district. The intent of these alerts is to forewarn Victorians of anticipated extreme heat days, allowing them to better plan for their health needs.

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

Table 20 shows the number of heat health alerts issued in 2020 and 2021. It includes the following heat seasons: January to March 2020, December 2020 to March 2021, and December 2021.

Between January and March 2020 the Chief Health Officer issued 15 heat health alerts across all 9 weather districts for 4 forecast extreme heat days. There were no forecast heatwaves.

Between November 2020 and March 2021 the Chief Health Officer issued 16 heat health alerts across all 9 weather districts for 4 forecast extreme heat days. One heatwave (3 or more days of extreme heat) was forecast for the Mallee district from 23 to 25 January 2021.

In December 2021 the Chief Health Officer issued one heat health alert in Central weather district for one forecast extreme heat day. There were no forecast heatwaves.

Table 20: Number of heat health alerts issued, by weather district, January 2020 to December 2021

District	January–March 2020	November 2020 – March 2021	November–December 2021
Central	2	2	1
East Gippsland	1	1	0
Mallee	2	4	0
North Central	1	2	0
North East	3	2	0
Northern Country	2	2	0
South West	1	1	0
West and South Gippsland	1	1	0
Wimmera	2	1	0
Total	15	16	1

For more information about heat health, visit the [historical heat health alerts webpage](https://www.health.vic.gov.au/environmental-health/planning-for-extreme-heat-and-heatwaves#historic-heat-health-alerts---december-2010-to-march-2022) <<https://www.health.vic.gov.au/environmental-health/planning-for-extreme-heat-and-heatwaves#historic-heat-health-alerts---december-2010-to-march-2022>>.

Heat health plan for Victoria

The *Heat health plan for Victoria* (incorporated in the *State emergency management plan extreme heat sub-plan* in 2022) outlines the actions the department took 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 a statewide public information campaign (formerly called *Survive the heat*) that aimed 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.

The *Addendum to the heat health plan for Victoria* (also retired with the *Heat health plan for Victoria*) was published in 2020 to outline other considerations for organisations when preparing for and responding to extreme heat events during the COVID-19 pandemic.

Find out more about extreme heat

For more information about extreme heat, its impacts on health and what you can do to prepare for it, visit the following webpages:

- [Extreme heat](https://www.betterhealth.vic.gov.au/extreme-heat) <<https://www.betterhealth.vic.gov.au/extreme-heat>>
- [Heat-related health problems](https://www.betterhealth.vic.gov.au/health/healthyliving/heat-stress-and-heat-related-illness) <<https://www.betterhealth.vic.gov.au/health/healthyliving/heat-stress-and-heat-related-illness>>
- [How to cope and stay safe in extreme heat](https://www.betterhealth.vic.gov.au/health/healthyliving/how-to-cope-and-stay-safe-in-extreme-heat) <<https://www.betterhealth.vic.gov.au/health/healthyliving/how-to-cope-and-stay-safe-in-extreme-heat>>.

Epidemic thunderstorm asthma

On 21 November 2016 Victoria experienced the world's largest epidemic thunderstorm asthma event, unprecedented in size, severity and impact.

Calls to triple zero (000), Ambulance Victoria, and our hospitals were pushed to the limit, with huge spikes in callouts and people presenting to hospital emergency departments. In the 30 hours from 6 pm on 21 November, there was a 672% increase in respiratory-related presentations to public hospitals in Melbourne and Geelong (3,365 more presentations than expected based on the 3-year average) and, tragically, the event contributed to 10 deaths.

Following this event, the department developed a multifaceted, comprehensive Epidemic Thunderstorm Asthma Program to address potential future impacts on the community and the Victorian health system.

The program includes:

- annual public health campaigns to raise awareness of those at risk, and the steps they can take to protect themselves from the risk of thunderstorm asthma – including an epidemic thunderstorm asthma campaign toolkit and resources in multiple community languages
- an epidemic thunderstorm asthma risk forecasting system, which operates each year during the grass pollen season (typically 1 October to 31 December)
- resources for health professionals, including expert clinical guidelines to identify and manage those at increased risk
- a syndromic surveillance system, which is used to more quickly recognise and better manage surges in demand on Victorian public health services
- enhanced state health emergency response arrangements to improve the preparedness and response during emergencies, and to better meet community health needs.

Three high risk forecast days were issued by the Department's Epidemic Thunderstorm Asthma forecasting system in 2020 and four high risk forecast days were issued in 2021.

Find out more about epidemic thunderstorm asthma

For more information on epidemic thunderstorm asthma, visit the department's [epidemic thunderstorm asthma webpage](https://www.health.vic.gov.au/environmental-health/epidemic-thunderstorm-asthma) <<https://www.health.vic.gov.au/environmental-health/epidemic-thunderstorm-asthma>>.

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Water

Water – chapter overview

Ensuring safe drinking water, now and in the future, is integral to promoting health and wellbeing in Victoria (Department of Health, 2022). To appreciate this, we only need consider the impact of waterborne disease where safe water and good sanitation have not been achieved.

Drinking water quality management continues to be a foundation for preventing and controlling waterborne disease globally (Department of Health, 2022). Evidence from around the world tells us that waterborne outbreaks are often the result of inadequate treatment or treatment failure, complacency and compromised source waters (Department of Health, 2022). In Victoria, the *Safe Drinking Water Act 2003* and the *Safe Drinking Water Regulations 2015* provide the frameworks to ensure drinking water supplied by water agencies is safe and aesthetically appealing to drink (Victorian Legislation, 2015; 2019a).

Climate change can challenge quality and supply of our drinking water through more frequent bushfires, floods, storms, power outages and algal blooms (Department of Health, 2022). Impacts include:

- reduced capacity for raw water harvesting
- challenges to safely treat the change in water quality
- maintaining acceptable water quality within distribution systems
- power failures disrupting critical water treatment barriers
- damage to critical water infrastructure.

As well as overseeing the *Safe Drinking Water Act* to ensure drinking water safety, the department has responsibilities under the *Health (Fluoridation) Act 1973* whereby fluoride is added to drinking water for dental health benefits (Victorian Legislation, 2012). Public aquatic facilities (swimming pools) are regulated under the *Public Health and Wellbeing Regulations 2019* to ensure these operate safely to maintain and promote active lifestyles, providing health benefits to all community members (Victorian Legislation, 2019b).

Safe drinking water

Water suppliers must have a risk management plan that identifies any risks from catchment to tap. They must then put in place measures to mitigate and prevent the risk and verify that those measures are effective (Department of Health, 2022). As part of this approach, water suppliers have to collect samples of drinking water from water sampling localities that have been specified under the Regulations. A water sampling locality is a discrete geographical area where water samples collected represent the drinking water supplied to that area (Department of Health, 2022).

As of 30 June 2021, there were 476 water sampling localities across the state, with an increase of 2 water sampling localities compared with 2019–20 (Department of Health, 2022).

In 2020–21 drinking water samples were collected from all 476 water sampling localities around Victoria and tested for water quality parameters to determine compliance with water quality standards (Department of Health, 2022).

Under the Safe Drinking Water Act, when a water supplier becomes aware that the drinking water it is supplying does not comply with a water quality standard, it must notify the department (Victorian Legislation, 2019a).

During 2020–21 there were 63 reports made to the department, with 6 resulting in the issuing of 'boil water' advisories and 3 resulting in 'do not drink' advisories issued by 7 water agencies (Department of Health, 2022). Advisories inform customers to take actions to protect public health while the water agencies identify the cause, take action to rectify the issue and verify that the water is safe to drink.

These notifications were managed through the collective efforts of water agencies and the department, fortunately avoiding adverse impacts to consumers.

Water fluoridation

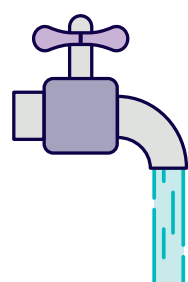
Water fluoridation significantly reduces tooth decay in people of all ages (COAG Health Council, 2015). Community water fluoridation is the most effective population-wide intervention to prevent tooth decay (COAG Health Council, 2015). Most Victorians living in metropolitan Melbourne have access to water fluoridation. However, there are still a number of Victorians living in rural and regional areas without access to water fluoridation (Department of Health, 2022).

In 2021, Coliban Water completed its Cohuna water fluoridation plant, providing 2,500 people with fluoridated drinking water for the first time (Department of Health, 2022).

By the end of 2021, more than 96% of Victorians, including 88% of rural and regional Victorians, had access to fluoridated drinking water (Department of Health, 2022).

Across 2020 and 2021 a number of water authorities began activities that will extend water fluoridation further. These will be covered in future *Your health* reports.

By the end of 2021, more than



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drinking water

Aquatic facilities

Public aquatic facilities include swimming pools, spa pools and interactive water features. Public aquatic facilities are important for maintaining and promoting active lifestyles and providing health benefits (Department of Health, 2023). However, if aquatic facilities are not properly managed, the health of bathers may be put at risk (Department of Health, 2023). Bathers can be affected by disease-causing microorganisms that are passed on through contaminated pool water, contaminated surfaces or person-to-person contact. This is particularly relevant for vulnerable groups such as young children, the elderly and people with low immunity. One particularly important microorganism that can cause serious illness in bathers is *Cryptosporidium parvum* – a hardy parasite that is well suited to survive in pool water (Department of Health, 2023).

Cryptosporidium parvum is a parasite excreted in the faeces of infected humans, cattle and other mammals. The infection is known as cryptosporidiosis. It occurs by:

- accidentally swallowing contaminated pool water
- drinking contaminated tap water
- consuming contaminated food
- directly contacting faeces such as from an infected child's nappies or an infected animal.

In 2020 and 2021 there were no *Cryptosporidium* outbreaks in Victorian aquatic facilities. This was probably due to many aquatic facilities being closed during extended periods of COVID-19 public health directions (Department of Health, 2024). For context, in 2019, 5 aquatic facility outbreaks were reported, with a median of 3 cases among bathers per outbreak (range: 2–11 cases).

Adapting to climate change

In responding to the water impacts of climate change, the department is investing in research to support better understanding of the risks posed by climate change to Victoria's drinking water supplies (Department of Health, 2022). This includes supporting a collective research program managed by Water Research Australia that focuses on understanding drinking water quality risks under low and variable water levels. The outcomes of the research will guide future strategies for managing the water quality impacts of declining water levels in drinking water dams and reservoirs. The department has developed resources to provide advice for managing private drinking water supplies, including after fires and floods.

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Food

Food – chapter overview

The department works with local councils, Commonwealth and state and territory partners, food businesses and the food industry to support food safety in Victoria. The department strives to ensure food sold across the state is safe and suitable to eat, and that Victorians are protected from food-related harm and illness.

Impact of the pandemic on food safety in Victoria

The years 2020 and 2021 saw Victoria's celebrated food industry feel the impact of public health actions in response to the COVID-19 pandemic. The significant changes to life brought by the pandemic affected how Victorians ate, socialised, ran businesses and engaged with our vibrant food culture (Department of Health, 2023).

While some of the department's Food Safety staff were redeployed to the COVID-19 response during 2020 and 2021, the department's key food safety activities continued. Food Safety staff strove to provide local councils, food businesses and the public with tools and information to ensure the department's food safety activities could continue – often using novel approaches to adapt to the changing circumstances posed by the pandemic (Department of Health, 2023).

One such change was providing temporary exemptions to food safety auditors to allow them to undertake inspections of class 1 facilities (those that provide food to vulnerable members of the community) via video where they would otherwise be unable to enter the premises in person. This change allowed businesses to continue operation and helped ensure food security to vulnerable community members (Department of Health, 2023).

Another key activity that continued was the monitoring of anaphylaxis notifications from health services. This required Food Safety staff to:

- provide allergen advice and training opportunities
- investigate outbreaks of foodborne illnesses
- undertake recalls of unsafe food.

This work is discussed below, as is another key activity – the investigation of the notification of a particular strain of *Salmonella*.

At the end of this chapter, amendments to the Australia New Zealand Food Standards Code are discussed, demonstrating the food policy work that continued to help keep our food safe – for all Victorians.

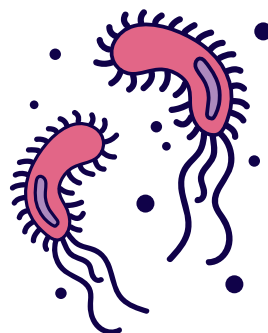
Salmonella

Salmonellosis commonly presents as an acute gastroenteritis with fever, vomiting, nausea, abdominal pain, headache and diarrhoea. Dehydration may occur, especially among infants and older people, where the infection can present with more serious consequences, including heart and lung impacts. Mortality is low but may be greater in older people and people who are immunocompromised (Department of Health, 2020).

Salmonellosis may incur significant social and economic costs because of lost productivity and impacts on industry and agriculture – as demonstrated in the *Salmonella* case study below.

In Victoria salmonellosis is a notifiable condition. Medical practitioners and pathology services must notify the department in writing within 5 days of diagnosis (Department of Health, 2024). Approximately 2,000 cases of salmonellosis are reported in Victoria each year. In 2020 there were 1,841 notifications of salmonella in Victoria and 1,396 notifications in 2021.

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Transmission is usually person-to-person or animal-to-person, through ingestion of organisms via contaminated or improperly cooked foods. Foodborne transmission particularly occurs with:

- raw and undercooked eggs and egg products
- raw milk and raw milk products
- poultry and poultry products
- raw red meats
- unwashed salads, fruits and vegetables, grains, seeds and nuts
- some shellfish and filter feeders, such as oysters (Department of Health, 2020).

Salmonella case study

In 2020 an outbreak of *Salmonella* Enteritidis occurred in Victoria.

Enteritidis is a rare *Salmonella* type in Australia and is usually associated with people who have contracted their infection overseas.

The 2020 outbreak resulted in 10 confirmed cases and 2 probable cases. All cases had *Salmonella* bacteria that were highly related genetically.

All cases had either purchased eggs or had backyard hens or both. Most of the eggs were bought from supermarkets, with 2 cases possibly purchased from a farm-gate sale.

In working with the individual cases who had contracted *Salmonella*, the department used enhanced surveillance questionnaires to ask about the purchase, preparation and consumption of eggs as well as information about backyard hens.

The outbreak resulted in the department working closely with Agriculture Victoria to respond to the human and poultry farm risks posed by the outbreak. While 7 poultry suppliers ultimately tested positive for *Salmonella* Enteritidis, Agriculture Victoria tested a much larger number of poultry suppliers to identify infected poultry stock and all possible sites infected with *Salmonella* Enteritidis. Agriculture Victoria also took a range of remediation measures including quarantine and environmental decontamination and testing requirements.

This work was complex given the movement of significant numbers of chickens between farms and suppliers that occurs as part of regular stock management.

This case also resulted in the department developing further advice for people with backyard chickens. This advice included information about ensuring good hygiene practices are in place, cracked or heavily soiled eggs are discarded, and all eggs are cooked thoroughly.

Source: Department of Health, 2020

Food allergies

Australia has a significant allergy problem, with more than 5 million people living with allergies (Murdoch Children's Research Institute, 2023). Australia also has the highest rates of childhood food allergy globally, affecting around 10% of 12-month-olds and 5% of 10- to 14-year-olds. Food allergy seems to have become more common in the past 30 to 40 years, although we do not have good studies from that time to measure this accurately (Murdoch Children's Research Institute, 2023).

Anaphylaxis is the most severe type of allergic reaction and should always be treated as a medical emergency. It requires immediate treatment. Delayed treatment can result in fatal anaphylaxis (Australian Society of Clinical Immunology and Allergy, 2024).

Anaphylaxis occurs after exposure to an allergen (usually to foods, insects or medicines), to which a person is allergic. Not all people with allergies are at risk of anaphylaxis.

Since 1 November 2018 public and private hospitals in Victoria have had to notify the department of anaphylaxis presentations (Department of Health, 2024). Notifications are classified according to suspected cause, as shown in Table 21.

Table 21: Number of notified anaphylaxis cases by suspected cause and year, 2020 and 2021

Year	Blood-derived product	Medication	Food	Insect venom	Other cause	Unknown	Vaccine	Total*
2020	2	209	1,187	119	48	198	5	1,768
2021	0	230	1,364	174	72	231	74	2,145

*These totals represent anaphylaxis notifications for both adults and children

As seen in Table 21, the overwhelming majority of anaphylaxis notifications are suspected to have been caused by a food product of some sort.

The primary purpose of the anaphylaxis notifications scheme is to allow the department to take swift action where a notification reveals a broader public health risk.

Such action may include overseeing a food company recalling an offending food product from the marketplace to protect public health.

Data also enables the department to better understand the burden of anaphylaxis and to inform public health policy, interventions and research.

Amendment to the Australia New Zealand Food Standards Code

The Australia New Zealand Food Standards Code sets out the safety, composition and labelling requirements for foods produced and sold in Australia and New Zealand. New standards are developed and existing standards amended by the independent statutory authority, Food Standards Australia New Zealand (FSANZ). Changes to the Code may be made to ensure regulations are fit-for-purpose, to support safe and suitable innovation or to respond to emerging public health and safety concerns.

Where the Food Ministers' Meeting approves draft variations, the variation is gazetted and automatically adopted by reference in state and territory food laws. In Victoria, the Code is implemented through the *Food Act 1984*.

Key changes to the Code

Two key changes to the Code were made in 2020 and 2021. The first of these introduced pregnancy warning labels on certain packaged alcoholic beverages. Alcohol consumption during pregnancy can cause a range of physical, cognitive, behavioural and neurodevelopmental impairments to unborn children, collectively known as fetal alcohol spectrum disorders (May et al., 2013). Recognising that warning labels can raise awareness and prompt discussion about the risks of drinking alcohol while pregnant, the Code was amended to require a pregnancy warning label (incorporating pictogram and text) to be displayed on packaged alcoholic beverages with more than 1.15% alcohol by volume for retail sale. The changes came into effect on 31 July 2020, with a 3-year transition period.

The second key change related to allergen labelling. The Code requires an allergen declaration on food packaging when certain allergens are present. The allergens that must be declared include a number of grains, fish, nuts, milk and eggs.

While existing allergen labelling requirements are mostly working well, a FSANZ review identified some instances where consumers may not have access to clear or consistent allergen labelling information due to a lack of standard practice in declaring allergens. FSANZ then recommended prescribed terminology and formatting for allergen labelling on food packaging. The amendments began on 25 February 2021, with a 3-year transition period. These help consumers find allergen information on food labels more quickly and easily and allow them to make safe food choices.

Food – chapter references

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Communicable disease

Aboriginal people

Since 2019 the department has released the *Aboriginal and Torres Strait Islander summary surveillance of notifiable conditions in Victoria interactive report* <<https://www.health.vic.gov.au/infectious-diseases/aboriginal-and-torres-strait-islander-summary-state-wide-victoria>>. The report is updated daily. The department provides data for a number of notifiable infectious conditions for reporting to the Communicable Diseases Network Australia due to the public health importance of these conditions in Aboriginal Victorians.

COVID-19 and reductions in communicable disease notifications

The closure of Australia's borders to international travel from March 2020 to February 2022 (ABS, 2022; Commonwealth of Australia, 2023) had a significant impact on the number of notified cases for several travel-associated notifiable conditions in Victoria, many of which declined by more than 90% from 2019 to 2021 (Table 22) (Department of Health, 2024). Public health and social measures (such as movement restrictions and promotion of hand hygiene) may also have limited the spread of some conditions such as shigellosis and influenza (AIHW, 2021).

Table 22: Number of notified cases and percentage decrease from 2019 to 2021 for selected notifiable conditions in Victoria

Disease	Number of notifications in 2019	Number of notifications in 2020	% change 2019 to 2020	Number of notifications in 2021	% change 2019 to 2021
Foodborne and enteric diseases					
Shigellosis	632	239	−62%	33	−95%
Hepatitis A	111	47	−58%	4	−96%
Typhoid	71	32	−55%	5	−93%
Paratyphoid	38	20	−47%	2	−95%
Salmonellosis	3,196	1,842	−42%	1,398	−56%
Cryptosporidiosis	754	497	−34%	404	−46%
Campylobacteriosis	7,291	7,071	−3%	8,562	+17%

Disease	Number of notifications in 2019	Number of notifications in 2020	% change 2019 to 2020	Number of notifications in 2021	% change 2019 to 2021
Vaccine-preventable diseases					
Influenza	69,598	4,791	−93%	110	−99%
Measles	57	5	−91%	0	−100%
Pertussis	4,742	1,158	−75%	317	−93%
Chickenpox	1,605	546	−66%	542	−66%
Invasive pneumococcal disease	511	192	−62%	245	−52%
Invasive meningococcal disease	89	19	−79%	10	−89%
Rubella	6	0	−100%	0	−100%
Diphtheria	3	0	−100%	0	−100%
Poliomyelitis	0	0	N/A	0	N/A

Disease	Number of notifications in 2019	Number of notifications in 2020	% change 2019 to 2020	Number of notifications in 2021	% change 2019 to 2021
Vector-borne diseases					
Chikungunya	28	11	−61%	0	−100%
Dengue	273	29	−89%	4	−99%
Malaria	69	44	−36%	15	−78%
Ross River	155	163	+5%	819	+428%
Barmah Forest	5	3	+40%	5	0%
Leptospirosis	13	6	−54%	13	0%
Psittacosis	10	24	+140%	24	+140%
Q fever	45	28	−38%	32	−29%

Source: Department of Health 2024

Stable or increasing communicable diseases rates

Buruli ulcer (*Mycobacterium ulcerans*)

Another public health issue that continued during 2020 and 2021 was the ongoing expansion of areas in Victoria where Buruli ulcer transmission occurs. Classified by the World Health Organization as a neglected tropical disease, this condition (also known as Bairnsdale or Daintree ulcer) is an infection of skin and soft tissue caused by the environmental pathogen *Mycobacterium ulcerans* (Boyd et al., 2012). Although generally not fatal, Buruli ulcer can result in long-term cosmetic and functional deformity if effective treatment is unavailable or delayed (Johnson, 2019). Early recognition, diagnosis and treatment can minimise the progression of symptoms (Boyd et al., 2012).

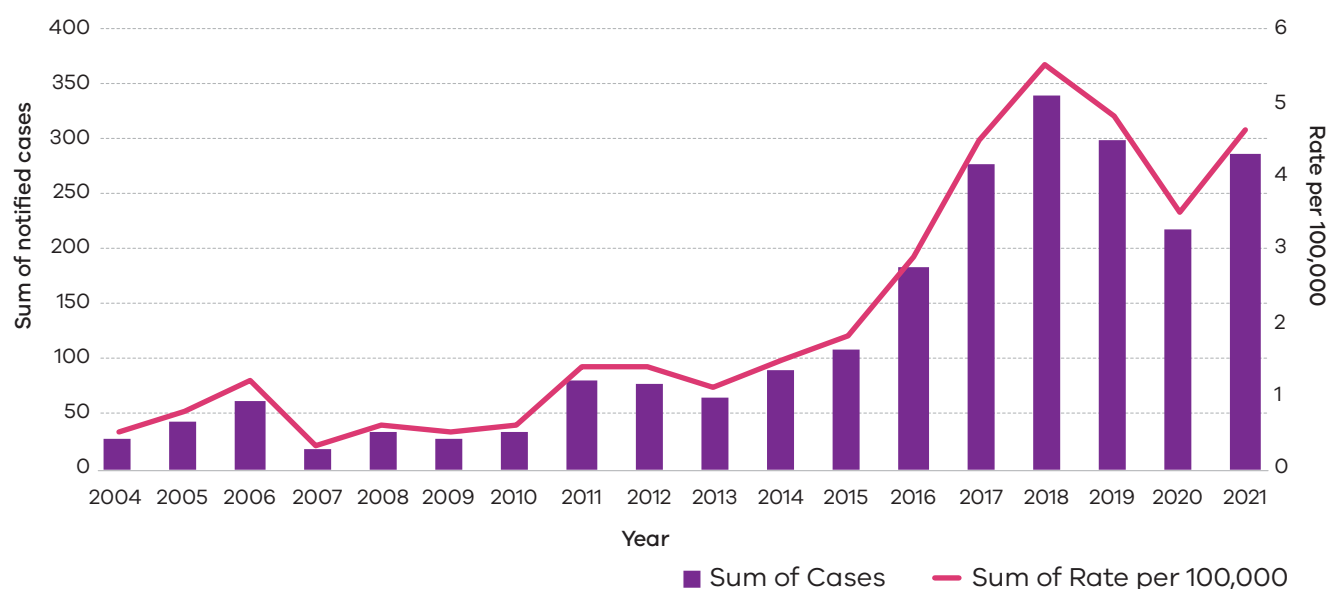
A geographically restricted disease, Buruli ulcer has been reported in 31 countries in Africa, the Americas, Asia and the Western Pacific (Portaels et al., 2009). Most cases occur in tropical and subtropical regions, except Australia, China and Japan.

Most Australian Buruli ulcer cases occur in Victoria, where it was first reported in East Gippsland in the 1930s before appearing in Philip Island, the Westernport region and many coastal areas around Port Philip Bay including Frankston and the Bellarine Peninsula. More recently, the bacteria has been observed along 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 2020 there was a decrease in the number of cases, possibly due to the travel restrictions imposed by COVID-19, resulting in a rate of 3.5 per 100,000 head of population. This was followed by a slight increase in 2021, with a rate of 4.6 per 100,000 (Figure 22).

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. In 2021 *Mycobacterium ulcerans* was identified in inner suburbs of Melbourne (Essendon, Moonee Ponds and Brunswick West).

The transmission of Buruli ulcer is not fully understood although recent research has provided new insights that will be covered in a future *Your health* report. In Victoria, possums may be an important reservoir of Buruli ulcer because the bacteria can be isolated from possum faeces in high-risk areas (Fyfe et al., 2010), while mosquitoes are assumed to play a role in the mechanical transmission of the bacteria to humans (Johnson et al., 2007). Buruli ulcer is rarely ever spread from person to person.

Figure 22: The total number of notified human cases of Buruli ulcer notified to the Department of Health each year from 2004 to 2021, with the average rate of infection (pink line) per 100,000 head of population



Legionella

Legionnaire's disease is a form of pneumonia (lung infection) caused by the bacteria *Legionella*, which is commonly found in the environment, especially in fresh water and soil (Cunha et al., 2016; WHO, 2024a). It is likely that COVID-19 measures had little impact on legionella cases. Total case numbers during the pandemic increased only slightly (by 10%) from pre-COVID levels. The increase was similar to the trend seen in pre-pandemic years. A particular species of *Legionella*, *Legionella longbeachae* (acquired from soil and potting mix), represented a higher proportion of *Legionella* cases in 2020–21 than in the preceding years. This trend is similar to the broader long-term increase in notifications of *Legionella longbeachae*.

Carbapenemase-producing organisms

Carbapenemase-producing organisms (CPOs) are a group of bacteria that have become resistant to many antibiotics, including a type of antibiotic called carbapenems, which are considered 'last resort' antibiotics for treating serious infections (Department of Health, 2023). This means that these antibiotics no longer work against these bacteria, which can make infections difficult to treat. There are 3 types of CPOs that are notifiable in Victoria:

- Carbapenemase-producing Enterobacterales ('CPE')
- Carbapenemase-producing *Acinetobacter* spp. ('CPA')
- Carbapenemase-producing *Pseudomonas* spp. ('CPP').

Case numbers for CPOs were impacted by public health measures introduced in response to COVID-19, and changes in case notification requirements. Prior to 2020, only CPE cases were notifiable. Cases with CPA or CPP were notified from 2020 onwards, but CPA and CPP cases make up a small proportion of the overall CPO numbers.

More CPO cases were notified in 2020 compared with the previous 4 years, but fewer CPO cases were notified in 2021 compared with the previous 4 years. Before the pandemic, close to 50% of CPO cases were suspected to have been acquired overseas. This includes receiving care in hospitals in countries where these resistant organisms are more widespread. In 2020 and 2021 fewer people travelled internationally due to the COVID-19 restrictions, resulting in fewer CPO cases being notified in Victoria. Better infection prevention and control measures in hospitals, or in some instances reduced testing for CPO as resources were directed elsewhere, might also have contributed to the fewer case numbers notified in 2021. Also, between 2020 and 2021 there were 9 episodes of CPE local transmission identified in health services.

Tuberculosis **(*Mycobacterium tuberculosis*)**

Tuberculosis is a bacterial infection that can cause disease in any part of the body but most often in the lungs. It is caused by infection with the bacteria *Mycobacterium tuberculosis* (WHO, 2024b).

Most cases in Victoria are in people who were born overseas (MacIntyre et al, 1993). Public health measures in response to COVID-19 had *some* impact on tuberculosis notifications from 2020 to 2021.

There was a record high number of tuberculosis notifications in 2020 for Victoria. This was largely due to the high levels of migration occurring in the prior years. The number of notifications declined in 2021, relative to 2020, due to fewer migrants arriving to Victoria in 2020 and 2021. A reasonable proportion of Victoria's tuberculosis cases would normally occur in migrant groups within a first year or so after arrival. In addition to notifications, public health measures in response to COVID-19 as well as structural changes and disruption to health service delivery might have had an impact on health-seeking behaviour and access to health services, diagnostics and treatment of tuberculosis, resulting in delays in diagnosis and treatment.

Communicable disease rates dramatically impacted by COVID measures

Vaccine-preventable diseases

Vaccine-preventable diseases are diseases for which there is an approved and effective vaccine available in Australia. Reductions in notifications were seen for most vaccine-preventable diseases within the 2020 to 2021 period.

A steep decline in measles and influenza cases was recorded in April 2020, and this decline continued throughout 2020 and 2021 (Table 22) (Department of Health 2024). This trend is likely due to reduced international travel resulting in less disease entering Australia and measures implemented to reduce respiratory spread of disease during the pandemic, including mask-wearing and isolation.

Also, between 2020 and 2021, notifications for pertussis (whooping cough), chickenpox, invasive pneumococcal disease and invasive meningococcal disease were reduced by more than 50% from the 2015–2019 average (Table 22). Some vaccine-preventable conditions such as invasive meningococcal and pneumococcal disease are particularly severe, with high morbidity and mortality (AIHW, 2019). As most cases are hospitalised, often with admission to intensive care units, reduced case numbers in 2020 and 2021 resulted in decreased hospital bed days.

Between 2020 and 2021, there were no notified cases of rubella, diphtheria or poliomyelitis. The reduction observed in the rates of these vaccine-preventable diseases was likely due to the restrictions placed on the population during the COVID-19 pandemic (Bhatt et al., 2022).

Foodborne and enteric diseases

Foodborne and enteric diseases can be caused by bacteria, viruses or parasites (WHO, 2024c). The symptoms vary depending on the cause and range from slight abdominal pain and nausea to retching, vomiting, abdominal cramps, fever and diarrhoea. Enteric diseases are otherwise known as gastroenteritis, illnesses triggered by infection and inflammation of the digestive system.

Most foodborne and enteric diseases showed significant reductions in the number of notifications from 2019 to 2021, with a more than 90% reduction in shigellosis, hepatitis A, typhoid and paratyphoid notifications. Salmonellosis and cryptosporidiosis showed less significant decline (40–50% reduction), whereas notifications for campylobacteriosis increased 17% from 2019 to 2021 (Table 22) (Department of Health, 2024). These observed reductions in rates could be due to better infection prevention practices in conjunction with less international travel during the COVID-19 pandemic.

Shigellosis

Shigellosis is a bowel infection caused by *Shigella* bacteria (WHO, 2005). Common symptoms include diarrhoea that may contain blood, mucus or pus, abdominal cramps, nausea and vomiting. To cause infection, the bacteria have to be consumed orally, either directly through physical contact with a person with the illness, or indirectly by contaminated food and water. *Shigella* can also be spread during sexual activity.

Shigellosis case numbers were dramatically impacted by COVID measures. Overseas travel is a common risk factor for shigellosis; the disruption of international travel during the COVID-19 pandemic resulted in a reduction of case numbers. Also, restriction measures may have further contributed to a reduction in local transmission of *Shigella*, resulting in large decreases in cases in 2020 and 2021. The increasing trend of multidrug resistance in *Shigella* cases (resistance to at least 3 commonly used antibiotics) observed pre-pandemic continued in 2020 and 2021.

Vector-borne diseases

Vector-borne diseases are human illnesses caused by parasites, viruses and bacteria that are transmitted by vectors such as mosquitoes. Locally, this includes Ross River virus, which is spread by mosquitoes and causes symptoms of fever, rash, joint inflammation and pain, muscle aches and fatigue. Ross River virus cases may have been impacted by COVID-19 measures. They remained low in 2020, similar to previous years, then spiked in 2021, which may be attributed to some extent to the relaxing of domestic COVID-19 pandemic travel restrictions, with more people travelling to endemic areas. As noted below in mosquito-borne diseases, conditions such as Ross River virus are also greatly impacted by weather conditions, especially flood events.

Psittacosis is a type of lung infection caused by the bacterium *Chlamydia psittaci* (Dembek et al., 2023). *Chlamydia psittaci* is commonly carried by birds of the parrot family including budgerigars, lovebirds and parakeets. The number of reported psittacosis cases increased in 2020, with a 140% increase from 2019. This increase could be due to more people staying home, potentially increasing exposure to domestic birds.

Dengue is a viral disease spread by mosquitoes in many tropical and subtropical parts of the world. Symptoms include high temperature, headache, pain behind the eyes, joint and muscle pains, nausea, rash and malaise (WHO, 2024d). Dengue was significantly impacted by COVID-19 border closure measures, resulting in a sharp decline in number of infections recorded in Victoria.

Malaria is an infection caused by a parasite that is passed to humans through the bite of an infected mosquito (WHO, 2024e). The infection is characterised by fever, shivering, chills, generally feeling unwell, headache and sweats, but it can also present as a respiratory or gastrointestinal illness. Australia is free of endemic malaria, but Australians can catch malaria when travelling to tropical regions in Asia, Africa and Central or Southern America. Malaria cases were significantly impacted by COVID-19 measures as international travel was impacted by border closures, resulting in fewer imported cases.

Mosquito-borne disease

There are almost a hundred species of mosquitoes in Victoria (Dobrotwovsky, 1965). Most are just annoying and do not spread disease. However, some mosquitoes can carry diseases that are transmitted through mosquito bites. In most years, during the months of October to March, under favourable environmental conditions, mosquitoes can increase in large numbers causing nuisance, and at times pose a public health disease risk for nearby communities. Mosquitoes can also breed in large numbers after heavy rainfall or flooding events (Tall et al., 2014), increasing the risk of disease transmission.

The Victorian Arbovirus Disease Control Program is a statewide collaborative program the department delivers through participating local councils to reduce the impacts of mosquito-borne diseases. This program integrates mosquito management principles, which include:

- mosquito surveillance
- chemical control
- mosquito bite prevention, behavioural change and public awareness
- physical control (source reduction).

A range of local councils across Victoria trap mosquitoes each week and submit the samples for identification, counting and virus screening. If viruses are detected in the mosquitoes, it provides an early warning that there is a health risk to local communities and that interventions to manage mosquitoes are required.

During 2020 and 2021 mosquito-borne viruses were detected in a total of 30 mosquito traps across Victoria, including Ross River virus (detected in 24 traps) and Barmah Forest virus (detected in 6 traps).

It is recognised worldwide that the successful management of mosquitoes requires multiple interventions (Xu and Zhao, 2023), as no intervention method alone will successfully reduce the risk of mosquito-borne diseases. Integrated mosquito management is based on an understanding of mosquito biology, mosquito life cycles and disease transmission. In response to these detections of viruses in mosquito populations the department works with impacted local councils and provides advice on the best control methods to reduce mosquito numbers and potential transmission of mosquito-borne diseases. In both 2020 and 2021, Chief Health Officer alerts were issued advising residents and tourists in affected areas to take precautions against mosquito bites.

The department also monitors notifiable mosquito-borne disease in Victoria. There are 4 mosquito-borne diseases that occur in Australia: Ross River virus, Barmah Forest virus, Murray Valley encephalitis and West Nile virus (Kunjin). Ross River virus and Barmah Forest virus cause mild illness including fever, headache, muscle ache and arthritic type symptoms that may persist for weeks to months, but rarely longer (Harley et al., 2001). In 2020 there were 163 notified human cases of Ross River virus, while in 2021 this figure increased to 819 human cases (Table 23). Ross River virus cases remained low in 2020, in line with the preceding couple of years. However, the increase in 2021 may be related to the relaxing of domestic COVID-19 pandemic travel restrictions, allowing movement to regional areas of the state where Ross River virus is more common. Ross River virus case numbers vary greatly from year to year and are often associated with heavy rainfall and flooding events. Barmah Forest notifications remained steady in 2020 and 2021. There were no human case notifications of Murray Valley encephalitis or West Nile (Kunjin substrain) recorded for Victoria in 2020 or 2021. These diseases are very rare in the southeast of Australia.

Table 23: Notifiable Australian vector-borne disease notifications, Victoria, between 2015 and 2021

Condition	2015	2016	2017	2018	2019	2020	2021	Total
Ross River	305	263	1966	130	155	163	819	3,801
Barmah Forest	10	4	18	6	5	3	5	51
Murray Valley encephalitis	0	0	0	0	0	0	0	0
West Nile (Kunjin)	0	0	1	0	0	0	0	1
Total	315	267	1985	136	160	166	824	3,853

The department also monitors vector-borne disease notifications for *exotic* diseases that are not known to occur in Australia. Table 24 shows the number of notifiable human cases of exotic mosquito-borne diseases. All cases of exotic mosquito-borne disease are followed up to determine the location of exposure, with all cases in 2020 and 2021 associated with overseas travel. The reduction in the number of exotic mosquito-borne disease notifications in 2020 and 2021 can be associated with the cessation of most international travel during the COVID-19 pandemic.

Table 24: Number of human case notifications received in Victoria for exotic mosquito-borne diseases between 2015 and 2021

Condition	2015	2016	2017	2018	2019	2020	2021	Total
Dengue	387	525	302	234	273	29	4	1,754
Malaria	59	79	83	88	69	44	15	437
Chikungunya	41	41	34	16	28	11	0	171
Zika	1	15	1	2	1	0	0	20
Japanese encephalitis	1	0	1	0	0	0	0	2
Total	489	660	421	340	371	84	19	2,384

Avian influenza

Avian influenza viruses are common in waterfowl globally, where for the most part they cycle harmlessly in these well-adapted hosts.

Avian influenza spreads between wild and domesticated birds, and outbreaks can occur in domestic poultry from time to time (Webster et al., 1992). Based on their ability to cause death and disease in poultry, avian influenza viruses are classified into low-pathogenic avian influenza and highly pathogenic avian influenza.

Very rarely avian influenza can spread from birds to people, particularly those who have had close contact with infected poultry and cause severe disease (Kalthoff et al., 2010).

Avian and human influenza strains can mix, resulting in new viruses that can transmit more easily between people and become a bigger threat to the community.

In 2020 Victoria experienced a large avian influenza outbreak in several regional areas, with egg, poultry and emu farms being affected.



Avian influenza is discussed more in the 'Key public health challenges' chapter.

Congenital syphilis

Congenital syphilis occurs when there is inadequately or untreated syphilis in a pregnant woman, resulting in mother to child transmission during pregnancy or at the time of birth. Congenital syphilis has re-emerged in Victoria: 12 cases were reported between 2017 and 2021, including 4 stillbirths. Prior to 2017, only 2 congenital syphilis cases were notified in the preceding 25 years. Three congenital syphilis cases were notified in Victoria in each of 2000 and 2001.

Reflecting nationwide trends, notifications of infectious syphilis received by the department have risen considerably over the past decade (655 cases in 2013 compared with 1,522 cases in 2021). Although most syphilis cases occur among men who have sex with men, recent shifts in syphilis transmission dynamics have resulted in increased infections among heterosexual men and women of reproductive age (15–49 years). This shift indicates that the Victorian syphilis epidemic has become more widespread (Aung et al., 2021). Between 2013 and 2021, the number of cases of infectious syphilis notified among women increased more than fivefold, from 36 to 194 per year.

Substantial progress has been made in responding to the rise in syphilis notifications in Victoria. Initial activities were focused on addressing the syphilis outbreak among gay and bisexual men. However, the changing nature of syphilis epidemiology in Victoria led to forming the Congenital Syphilis Incident Management Team in 2018 to oversee Victoria's response to the re-emergence of congenital syphilis. Since 2019, the Incident Management Team has also overseen the response to an increase in syphilis notifications in the Mildura local government area.

Victoria has implemented a number of successful interventions to enhance testing, treatment and partner notification among certain groups. For example, during the first 3 years of operation of the Syphilis in Pregnancy Project, a nurse-led outreach service, the department supported 80 women diagnosed with syphilis during pregnancy (who were at high risk of congenital syphilis) with access to timely treatment, partner notification and support. There were no congenital syphilis cases among this cohort.

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Immunisation

Immunisation – chapter overview

Immunisation is one of the most effective ways of preventing illness and death from vaccine-preventable diseases.

Vaccines provide benefits not only for children and adults who are immunised but also for the wider community. When enough people are immunised, disease spread is reduced. This helps to protect vulnerable people in our community who cannot receive a vaccine because they are too young or too sick to be immunised.

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 (Department of Health and Aged Care, 2019).

This section provides information on:

- the National Immunisation Program
- local council immunisation services
- scheduled immunisation coverage in young children
- Victoria's Secondary School Immunisation Program
- refugee and asylum seeker immunisation programs.

National Immunisation Program

Under the National Partnership on Essential Vaccines the Australian Government is responsible for national immunisation policy and for purchasing National Immunisation Program vaccines (Department of Health and Aged Care, 2021a). Jurisdictions are responsible for coordinating immunisation service delivery and distribution of vaccines under the program.

The program schedule is a series of immunisations given at specific times throughout a person's life, from birth through to adulthood. As of November 2021, this included 21 vaccines that are free for eligible cohorts at scheduled ages. Extra vaccines are recommended for people with risk factors, and catch-up doses for missed childhood vaccines are free for certain groups of people (such as refugees).

Victoria also provides other free vaccines to eligible cohorts through its state-funded vaccination program (Department of Health, 2021). This program aims to respond to existing or emerging vaccine-preventable disease priorities in Victoria that are not covered under the National Immunisation Program.

Local council immunisation services

During the COVID-19 pandemic local council immunisation services continued to focus on delivering government-funded vaccines to ensure continued access for eligible Victorians and to maintain high immunisation coverage rates for these essential vaccines.

During this time, the Australian Technical Advisory Group on Immunisation (2020) recommended immunisation services implement a range of infection prevention and control measures. Models of care were adapted to be COVIDSafe, and high-risk groups were prioritised for receiving immunisation services (including infants and children younger than 7 years of age, adolescents, pregnant women and Aboriginal people). These measures enabled continuity of immunisation service delivery, ensuing timely access to vital vaccines and helping to maintain high rates of vaccine uptake under the program throughout the COVID-19 pandemic (Hull et al., 2021).

Scheduled immunisation coverage in young children

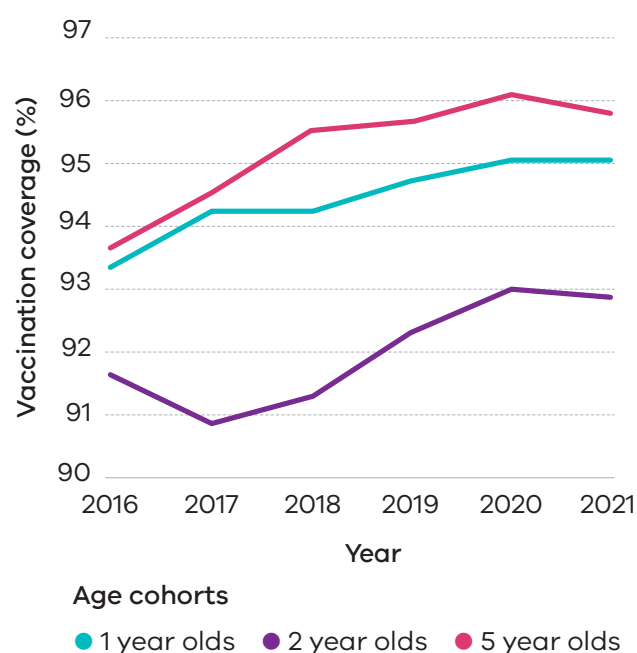
A comparison of immunisation coverage of Victorian children aged 1, 2 and 5 years shows that Victoria has achieved consistently high childhood immunisation rates that have continued to climb over time. This is likely the result of:

- effective messaging that routine immunisation is an essential health service
- continued engagement of parents and carers by trusted immunisation services
- providing COVIDSafe immunisation options during the pandemic (Hull et al., 2021).

In 2020 childhood immunisation rates continued to increase, with 94.8% of Victorian children up to date with immunisation at the age of 5. These rates tapered slightly in 2021, falling by 0.8% to 94% (National Centre for Immunisation Research and Surveillance Australia, 2021) (Figure 23).



Figure 23: Victorian childhood vaccination coverage between 2016 and 2021 for children aged 1 year, 2 years and 5 years



Source: Department of Health and Aged Care, 2021b

In 2020 immunisation rates in Aboriginal children remained consistently high, with 97% of all 5-year-olds being up to date with their immunisations. This figure declined slightly to 96.4% in 2021 (National Centre for Immunisation Research and Surveillance Australia, 2021).

Victoria's Secondary School Immunisation Program

The Secondary School Immunisation Program provides free vaccines for students in Years 7 and 10 as part of the National Immunisation Program. Local councils work with schools to deliver school-based immunisation, ensuring adolescents living or being educated within each municipality have access to immunisation services.

During the COVID-19 pandemic, public health measures meant that many children moved to learning from home in 2020, making school-based immunisation sessions more challenging to coordinate and deliver.

Despite this, human papillomavirus immunisation rates remained relatively consistent for 15-year-old girls and boys across Victoria due to targeted activities to support uptake (Table 25).

Table 25: Human papillomavirus immunisation (dose 1 and course completion) coverage for girls and boys by 15 years of age in Victoria, in 2019, 2020 and 2021

Dose	Girls (%)			Boys (%)		
	2019	2020	2021	2019	2020	2021
Dose 1	87.6	88.2	87.5	85.7	86.2	85.9
Course completion	81.4	82.0	81.2	78.6	78.4	78.4

Note: Course completion is defined as receiving 2 doses if dose 2 is given ≥ 5 months after dose 1 or receiving 3 doses if dose 2 is given ≥ 5 months after dose 1 (National Centre for Immunisation Research and Surveillance Australia, 2021).

The department continues to monitor immunisation coverage rates for adolescents affected by the COVID-19 pandemic and works with local council immunisation services to improve immunisation uptake. This includes a particular focus on human papillomavirus vaccination, in efforts to eliminate cervical cancer in Victoria by 2030 (Department of Health, 2020).

Refugee and asylum seeker immunisation programs

Refugees and asylum seekers arriving in Australia are often under- or un-vaccinated. In 2021 Victoria received approximately 35% of people seeking asylum in Australia (Refugee Health Network, 2022).

The Program for Refugee Immunisation, Monitoring and Education was established as an initiative to support catch-up immunisation in refugee and asylum seeker communities through 4 immunisation sites:

- City of Greater Dandenong
- City of Whittlesea and Hume
- Asylum Seeker Resource Centre
- Cabrini Asylum Seeker and Refugee Health Hub.

These organisations worked with community groups, settlement agencies and primary care, and have expanded immunisation service provision year-on-year.

In 2021 Australia had a smaller number of arrivals through the Australian Humanitarian Program due to COVID-19-related border closures. After 18 months of closed borders, the humanitarian program started again in late 2021, with Victoria accepting approximately three-quarters of Australia's Afghan humanitarian intake.

During the COVID-19 pandemic, models of care adapted to be COVIDSafe by moving from drop-in style sessions to larger, centralised venues with appointment-based systems. Despite the pandemic disruptions, program data indicates that more than 6,000 refugees and asylum seekers were referred to the program, and almost 5,000 people completed their catch-up immunisation program in 2020–21.

In late 2021 the Program for Refugee Immunisation, Monitoring and Education began to support initiatives and activities to foster community engagement and increase COVID-19 vaccination rates in refugee communities.

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Non-communicable disease

Non-communicable disease – chapter overview

Non-communicable disease typically refers to a broad classification of chronic diseases that persist over a long period of time or recur. These conditions can have a significant impact on a person's health, wellbeing, socioeconomic standing and quality of life. They can be the result of a combination of genetic, physiological, environmental and behavioural factors (WHO, 2023a).

Chronic disease is the biggest challenge facing Victoria's health system. This section includes summarised data from the following major disease groups:

- cancer
- heart disease
- chronic respiratory diseases
- stroke
- diabetes
- musculoskeletal conditions.

During 2020 and 2021, the COVID-19 pandemic affected the health and wellbeing of those with non-communicable disease in several ways. People with a pre-existing chronic disease are typically at greater risk of contracting and experiencing complications of COVID-19, including an increased risk of death (Nikoloski et al., 2021). It also led to disruptions in usual care and the diagnosis and management of non-communicable disease (Chang et al., 2020).

These factors mean that the trends in non-communicable disease in Victorians observed during this period are different from previous years and may make it challenging to draw direct comparisons.

Impact of the pandemic on cancer screening

The COVID-19 pandemic impacted various aspects of people's lives, particularly their access to and use of health services, including cancer screening. In Victoria, health care services adapted by modifying service delivery methods. These service changes, coupled with modifications in individual behaviours due to restrictions, highlighted the pandemic's impact on cancer screening participation and access across the state.

For example, breast cancer screening saw a decline in 2020, with 178,754 eligible women aged 50–74 undergoing mammograms, a reduction compared to previous years. Encouragingly, participation improved in subsequent years, with 227,416 women screened in 2022 (BreastScreen Victoria, 2022). Similarly, the National Bowel Cancer Screening Program experienced a decline in participation in Victoria, with rates falling from 46.5% in 2019–2020 to 43.9% in 2020–2021 (AIHW, 2023a).

Multimorbidity

Multimorbidity refers to a person experiencing 2 or more co-existing chronic conditions. An ageing population and the increase in the prevalence of chronic conditions mean that more Victorians are living with multiple health conditions. This number is expected to rise.

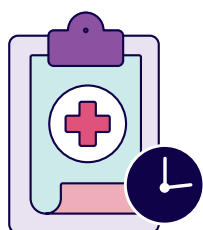
Managing multiple chronic conditions can have a significant impact on a person's health and wellbeing and often requires complex ongoing care.

In 2020 the proportion of Victorian adults who reported being diagnosed with 2 or more of the surveyed chronic conditions was 20.5% overall. This proportion was lower in men (17.7%) than women (23.2%) (VAHI, 2021a).

Cancer

Cancer continues to have a significant impact on the health and wellbeing of Victorians. It is a leading contributor to the burden of disease in Victoria.

In 2021 almost 37,000 Victorians were diagnosed with cancer, of which 20,210 (54.7%) were in men and 16,751 (45.3%) were in women. This equates to an average of 101 new cancer diagnoses every day, or one every 14 minutes (Cancer Council Victoria, 2022).



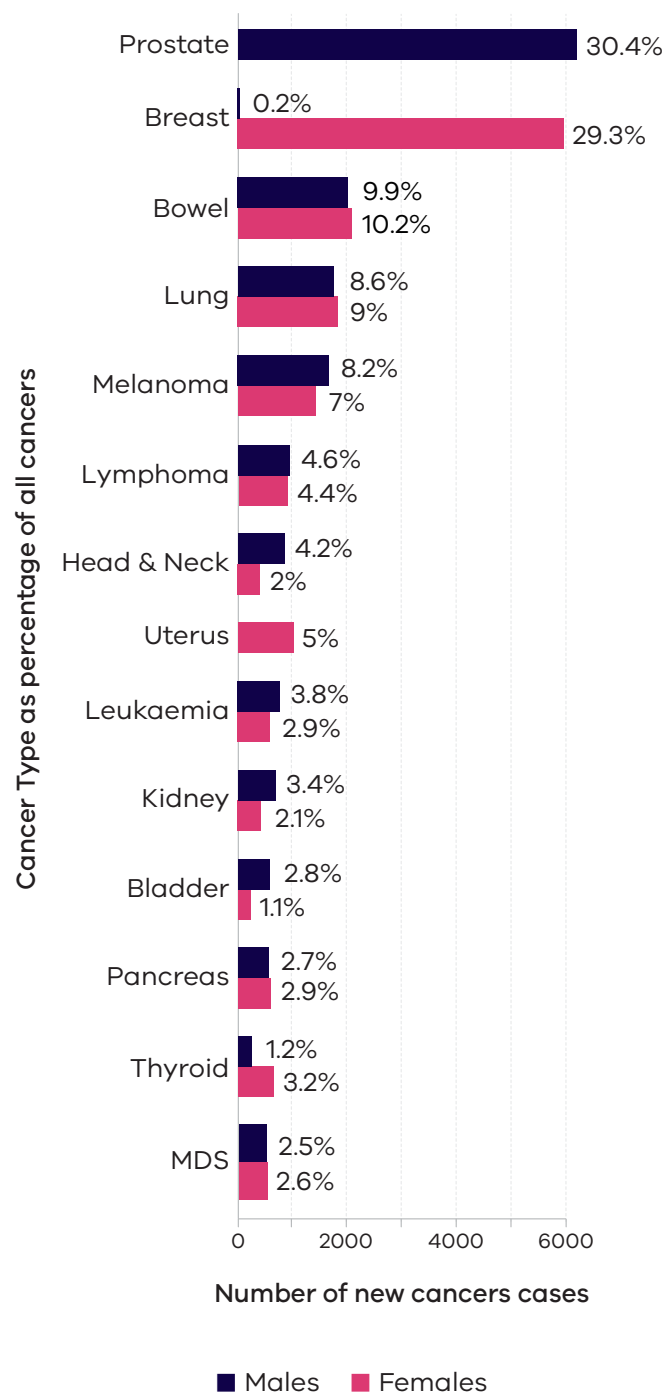
In 2021, an average of
101
new cancer diagnoses
were made each day,
or one every 14 minutes

Following a steady year-to-year increase in age-standardised rates of cancers in Victoria from 1982–2019, there was a decline in expected cancer diagnoses for 2020 and 2021. In 2021 there were 4.3% fewer cancer diagnoses than expected. This is likely due to the impacts of the COVID-19 pandemic, which reduced the number of Victorians coming forward to be screened, tested and diagnosed (Cancer Council Victoria, 2022).

Cancer is strongly related to age, with the number of cancer diagnoses increasing 21-fold in people aged between 25 and 59 years compared with those aged under 25 years. It is predicted that 2 in 5 males and 1 in 3 females in Victoria will develop cancer by the age of 75 (Cancer Council Victoria, 2022).

The 5 most common cancers in Victoria are prostate, breast, bowel, lung and melanoma, which accounted for 56% of all new cancers in 2021. Leading cancer types by sex are shown in Figure 24.

Figure 24: Leading cancer types by sex, Victoria 2021 – number and percentage of new cases (incidence) for the most common cancers



Source: Cancer Council Victoria (2022)

Cancer and Aboriginal Victorians

Aboriginal Victorians are twice as likely to be diagnosed with cancer and 3 times more likely to die from cancer compared with non-Aboriginal Victorians. There was an average of 301 cancer diagnoses in Aboriginal Victorians each year between 2016 and 2020. Overall incidence rates were significantly higher for Aboriginal Victorians (686 and 571 new cases per 100,000 for Aboriginal men and women respectively) than for non-Aboriginal Victorians (349 and 281 new cases per 100,000 non-Aboriginal men and women respectively). Cancer death rates were higher in Aboriginal Victorians (270 and 220 deaths per 100,000 for men and women respectively) than in non-Aboriginal Victorians (89 and 64 deaths per 100,000 respectively) (Cancer Council Victoria, 2022).

Cancer mortality

During 2021 an average of 32 Victorians died from cancer every day. Lung, bowel, prostate, pancreatic and breast cancers account for half of all cancer deaths (Cancer Council Victoria, 2022).

Since 1982, annual decreases in cancer death rates of 1.7% for males and 1.3% for females have been recorded. These trends are attributed to earlier detection of cancers through screening, improved recognition of symptoms prompting diagnosis, declines in lung cancer (secondary to reductions in tobacco use) particularly in males, and improvements in treatment such as targeted drug therapies (Cancer Council Victoria 2022).

The 5-year cancer survival rate was 71% for the first time in 2021; 69% in males and 72% in females. This is compared with 5-year-survival rates 3 decades ago (1986–1990), which were 48%. We expect to see the 5-year-survival rate continue to increase (Cancer Council Victoria, 2022).

The 5-year cancer survival rate was

71%

for the first time in 2021

69% in males

72% in females

This is compared with 5-year-survival rates 3 decades ago (1986–1990), which were 48%



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 or 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 2021 more than 2,800 Victorians were diagnosed with melanoma. Of these, 1,650 (58.4%) were males and 1,174 (41.6%) were females (Cancer Council Victoria, 2023).

Regional Victorians are 44% more likely to be diagnosed with melanoma than Victorians living in major cities (Cancer Council Victoria, 2022).

Figure 25 shows the distribution of melanoma incidence in Victoria in 2021, by sex within age groups. In Victoria, the median age at diagnosis of melanoma is 64 years in males and 59 years in females (Cancer Council Victoria, 2023).

In 2021 there were 183 male and 108 female deaths caused by melanoma (Cancer Council Victoria, 2022). Figure 26 shows the trend in Victorian incidence and mortality of melanoma for the period 1982 to 2021 by sex.

In 2021 melanoma accounted for 7.7% of all cancers diagnosed and 2.5% of all cancer-related deaths. Melanoma was the fifth most diagnosed cancer and the 14th most common cause of cancer-related death in Victoria (Cancer Council Victoria, 2023).

Figure 25: Distribution of melanoma incidence in 2021, Victoria, by sex within age groups

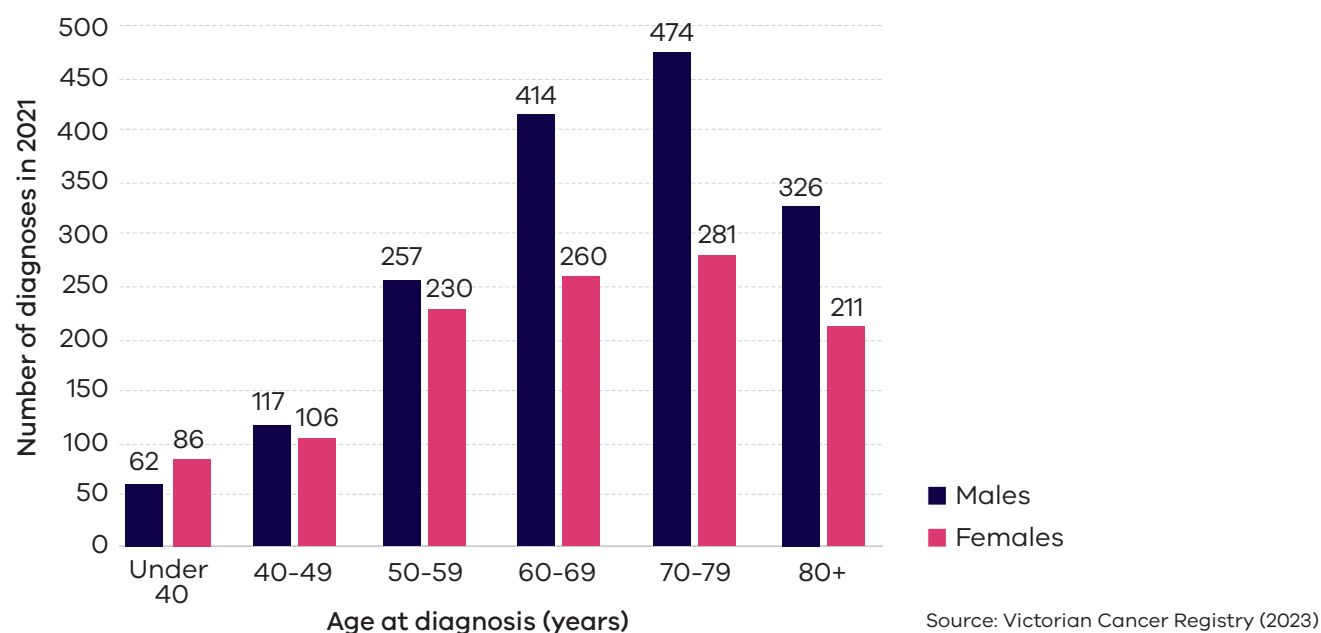


Figure 26: Trend in Victorian incidence and mortality of melanoma for the period 1982 to 2021 by sex

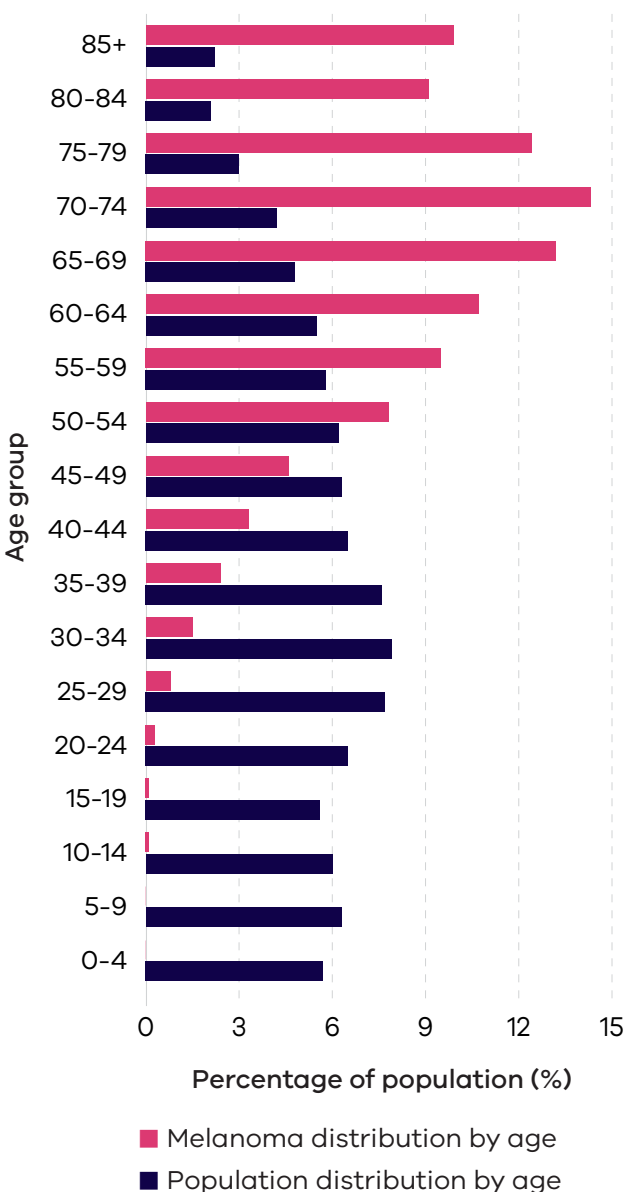


Source: Victorian Cancer Registry (2023)

Since 1982, the incidence of melanoma has increased by an average of 1.5% per year in males and 0.5% in females. Over the past 39 years, mortality from melanoma has decreased by 0.4% per year in males and 1.6% per year in females (Cancer Council Victoria, 2023).

Figure 27 shows the distribution of melanoma incidence in 2021 across age groups, with older age groups impacted more than younger age groups.

Figure 27: Distribution of melanoma incidence in 2021, compared to the distribution of the Victorian population in 2021, by 5-year age brackets



Survival rates

Five-year survival rates for melanoma increased from 85% between 1986 and 1990 to 93% between 2016 and 2020 (Cancer Council Victoria, 2023).

Increasing sun protection and early detection are key to further reducing the disease burden of melanoma. However, as with all cancers, the impact of the COVID-19 pandemic on melanoma diagnoses needs to be considered.

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.

Incidence and mortality

The most common types of non-melanoma skin cancers (such as basal and squamous cell carcinomas) are not reported to the Victorian Cancer Registry. Therefore, only estimates of their incidence can be provided (Cancer Council Victoria, 2020).

Non-melanoma skin cancers are often self-detected and are usually removed in doctors' surgeries, sometimes without histological confirmation due to destructive treatment techniques. Otherwise, treatment is with topical creams where tumour sites are only excised in post-treatment testing (Staples et al., 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 more than 1.1 million Medicare skin cancer treatments Australia-wide (Services Australia, 2022).

Findings from the annual Bettering of Evaluation and Care of Health surveys of general practice, conducted between 2006 and 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. It was consistently among the top 10 conditions managed by GPs (Britt et al., 2016).

Despite the high incidence of non-melanoma skin cancer, mortality rates are relatively low. In 2020 the Australian Bureau of Statistics reported 162 deaths from non-melanoma skin cancers, and in 2021 there were 156 reported deaths (ABS, 2021; 2022).

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 diagnosed and treated, which will increase 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. Non-melanoma skin cancers accounted for a quarter of all cancer-related hospitalisations in Australia between 2019 and 2020 (AIHW, 2021).

Heart disease

Heart disease is a collective term that covers diseases such as coronary heart disease, heart failure, cardiomyopathy, and congenital heart disease (VAHI, 2021b). In 2020, 9.6% of Victorian men and 6.2% of Victorian women reported previous or current heart disease (VAHI, 2021a).

In 2020,

9.6%

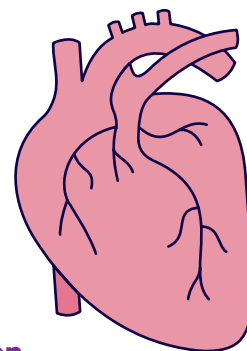
Victorian men

and

6.2%

Victorian women

**reported previous or
current heart disease**



Coronary, or ischaemic, heart disease is the most common type of heart disease and remains the leading cause of death in Australia. In 2020 and 2021, more than 4,000 Victorians lost their lives to coronary heart disease each year, accounting for 10% of all deaths in Victoria (ABS, 2021; 2022). Aboriginal people are more likely to die from heart disease compared with non-Aboriginal Australians (Heart Foundation, 2024).

The 2 major forms of coronary heart disease are heart attack, also known as acute myocardial infarction, and angina. A heart attack occurs when blood supply to the heart is blocked, causing damage to the heart muscle and its function. Angina is a chronic condition where episodes of chest pain occur periodically, caused by a temporary shortage of blood supply to the heart. This can be associated with an increased risk of heart attack (VAHI, 2021a).

There are several risk factors that may be changed to lower the individual risk of heart disease (Heart Foundation, 2024):

- smoking
- inactivity
- being overweight or obese
- heavy alcohol drinking
- high blood pressure
- high cholesterol
- diabetes
- social isolation and work stress.

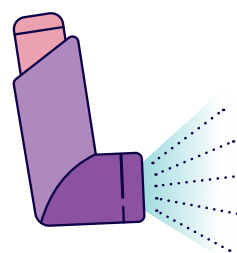
There is a higher risk of heart disease for those living in low socioeconomic areas and of certain ethnic backgrounds, including Aboriginal people and those of South Asian, Middle Eastern, Māori or Pacific Islander descent (Heart Foundation, 2024).

In 2020 and 2021, COVID-19 was a risk to those with heart disease both directly through infection and by affecting the management of heart disease in some cases. In the initial stages of the COVID-19 pandemic, the number of coronary angiographies, which are procedures used to diagnose and treat coronary heart disease, dropped by 27% between March and April 2020. During 2020 and 2021, 20% of those hospitalised from COVID-19 were also managed for cardiovascular disease, which includes heart disease (AIHW, 2023b).

Chronic respiratory diseases

Chronic respiratory diseases affect the lungs and other structures in the airways. The most common of these diseases are asthma and chronic obstructive pulmonary disease (COPD) (AIHW, 2024). Asthma is a chronic inflammatory condition affecting the airways. People with asthma experience episodes of cough, wheezing, breathlessness and chest tightness due to narrowing of the airways (Asthma Australia, 2024). Asthma can be triggered by a range of factors including pollen, cigarette and vape smoke, exercise and respiratory viruses such as the common cold (Better Health Channel, 2023a).

In 2020, 19.7% of Victorian adults reported ever being diagnosed with asthma. This proportion was lower in men (18.2%) than women (20.9%). Asthma attacks can threaten life, and asthma caused 185 deaths across Victoria in 2020 and 2021 (VAHI, 2021b).



**In 2020,
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reported ever being
diagnosed with asthma**

Chronic obstructive pulmonary disease (COPD) is a preventable lung disease that leads to chronic obstruction of airflow that is not fully reversible. It can also be called emphysema or chronic bronchitis. COPD develops gradually over time, and symptoms don't typically appear until mid-life, after significant lung damage has occurred. The symptoms of COPD can be similar to asthma. Cigarette smoking and air pollution are the most common causes of COPD worldwide (AIHW, 2024; WHO, 2023b).

In 2020, 3.5% of Victorian adults reported ever being diagnosed with COPD. In Victoria, COPD was the underlying cause of death in 1,420 deaths in 2020 and 1,604 deaths in 2021 (VAHI, 2021b).

Asthma and COPD cannot be cured. However, with good management, people with asthma can lead normal, active lives, and the progression of COPD can be slowed. A range of programs and services are available to support people with asthma and COPD (Better Health Channel, 2018; 2023a).

Stroke

Stroke occurs when a blood vessel supplying blood to the brain either blocks (ischaemic stroke) or ruptures and bleeds (haemorrhagic stroke) (Stroke Foundation, 2024).

Ischaemic stroke accounts for about 80% of stroke, while haemorrhagic stroke accounts for about 20% (VAHI, 2021b). 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, 2023b).

In 2021 stroke was the third leading cause of death in Victoria. It was responsible for more than 5.5% of all deaths in the state, with women more likely to die from stroke than men (ABS, 2022).

In Victoria, 2.2% of people have self-reported prevalence of stroke, and it was not significantly different between the sexes (VAHI, 2020).

Diabetes

Diabetes mellitus, also called diabetes, is a common chronic condition characterised by high blood glucose (sugar) levels. The 2 main types of diabetes are type 1 (insulin-dependent) and type 2 diabetes (AIHW, 2023c). Gestational diabetes is another form of diabetes that affects women during pregnancy, although they have had no prior diagnosis of diabetes. This condition usually subsides after birth but is a risk factor for type 2 diabetes developing in the woman and baby in the future (Diabetes Australia, 2024a).

Type 1 diabetes

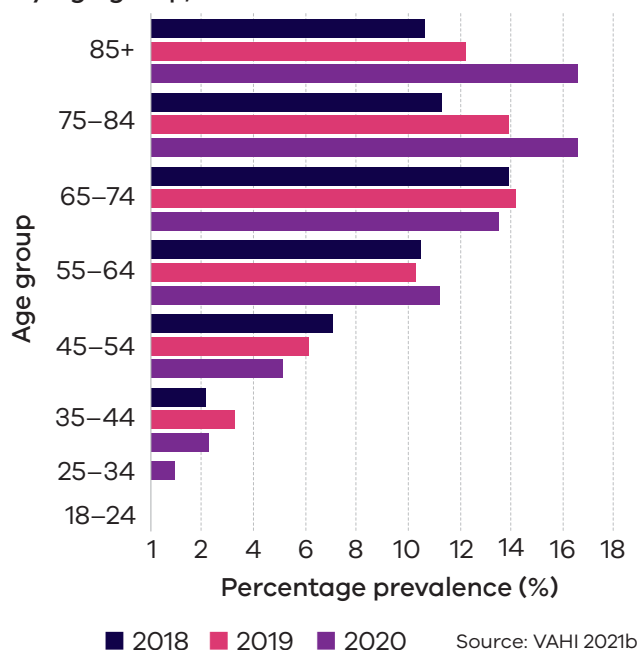
Type 1 diabetes is an autoimmune disease in which the body's immune system destroys the insulin-producing cells of the pancreas. This means the affected person cannot produce enough insulin, which is an essential hormone for controlling glucose levels in the blood. Type 1 diabetes most commonly begins in people under the age of 30 years. People with type 1 diabetes need replacement insulin injections several times a day, or insulin given by an insulin pump. Unlike type 2 diabetes (refer below), it is not caused by lifestyle factors. Type 1 diabetes accounts for approximately 10% of cases in Victoria (Diabetes Australia, 2024b).

Type 2 diabetes

Type 2 diabetes is the most common form of diabetes that occurs mostly in people 45 years of age or older. Risk factors for type 2 diabetes include being overweight or obese and having a family history of the condition (Diabetes Australia, 2024c). Type 2 diabetes accounts for 85–90% of all cases of diabetes. It is caused by insufficient production of insulin and/or the body becoming resistant to insulin levels in the blood. In some cases, healthy eating and regular physical activity can control the condition. Over time, more cases will require treatment with medications, non-insulin injectable medications and insulin to prevent complications (Diabetes Australia, 2024c). In Victoria, 5.8% of people have self-reported doctor-diagnosed diabetes (VAHI, 2021b). Type 2 diabetes is increasingly prevalent in younger age groups, although is mostly seen in people aged over 45 years of age (VAHI, 2021b).

Figure 28 shows type 2 diabetes appearing in the 25–34 year age group for the first time in 2020 and increasing in older age groups across 2018–2020.

Figure 28: Prevalence of type 2 diabetes by age group, 2018–2020



Musculoskeletal conditions

Musculoskeletal conditions affect the bones, muscles, joints and connective tissues. They are usually characterised by pain, reduced mobility and impaired function, which can affect our ability to take part in daily activities. They can occur across the course of our lives, from childhood to older age. They can lead to disability and contribute to the risk of developing other chronic medical conditions including mental health issues. Common types include back pain, osteoporosis and various forms of arthritis.

The most recent national data for 2020 and 2021 estimate that 6.9 million, or almost 1 in 3 (27%), Australians have a chronic musculoskeletal condition (AIHW, 2023d). But due to the COVID-19 pandemic and related disruptions, data collected during this period are thought to be less comprehensive than previous years, making it difficult to compare trends.

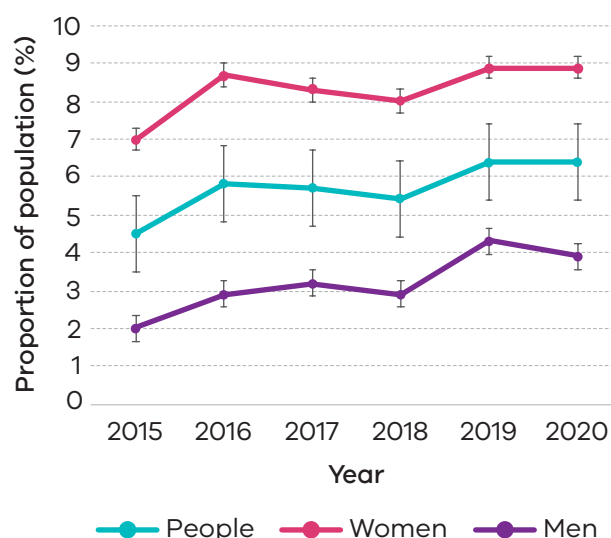
According to the World Health Organization, musculoskeletal conditions are a leading contributor of disability worldwide as well as the highest contributor for the need for rehabilitation services (WHO, 2022). In 2019 an estimated 1.71 billion people, or around 1 in 5 people, experienced a musculoskeletal condition (Cieza et al., 2021).

Osteoporosis

Osteoporosis is a condition that occurs when bones become more fragile due to an overall loss of minerals, such as calcium, from the bones (Healthy Bones Australia, 2024). This results in an increased risk of fractures, even from a simple incident such as falling out of a bed or chair or tripping while walking. People with osteoporosis are often not aware that they have the condition until a fracture occurs because there are usually no other obvious symptoms or signs. Osteoporosis occurs more frequently in older age and in women compared with men.

In 2020, 6.4% of the adult Victorian population reported having a diagnosis of osteoporosis, with the condition affecting more women (8.9%) than men (3.3%) (VAHI, 2021a). Trends in osteoporosis prevalence in Victoria increased slightly between 2015 and 2020 (Figure 29).

Figure 29: Proportion of Victorians diagnosed with osteoporosis by sex, 2015-2020



Source: VAHI 2021b

Osteoporosis is a mostly preventable condition. From a young age, people can implement steps to help prevent against osteoporosis such as (Better Health Channel, 2023b; Healthy Bones Australia, 2024):

- eating a varied and healthy calcium-rich diet (that includes vegetables, fresh fruit and whole grains)
- absorbing enough vitamin D
- avoiding smoking
- limiting caffeine and alcohol consumption
- doing regular weight-bearing and strength-training exercises.

Early diagnosis and treatment can improve bone health and help prevent against fractures. There are a range of treatment options available to suit individual needs. These can include medications as well as other measures to prevent against falls and injuries.

Arthritis

Arthritis is a general term for a wide range of inflammatory conditions that affect the joints, bones and muscles. At times, they can also affect other parts of the body such as the eyes.

People with arthritis often experience pain, stiffness and swelling of the joints, which can reduce movement and function. Other symptoms of arthritis can include feeling tired or generally unwell (Arthritis Australia, 2024a).

Age, genetic factors, being overweight or obese, and previous injury are some of the risk factors that increase the risk of developing arthritis (AIHW, 2023e).

The 2 most common forms of arthritis are osteoarthritis (a degenerative condition that mainly affects the joints in the hands and weight-bearing joints such as the hips, knees and ankles) and rheumatoid arthritis (an autoimmune condition where the immune system attacks the body's own tissues in the joints and other parts of the body) (AIHW, 2023e; Arthritis Australia, 2024b).

National data from 2017–2018 show that almost 1 in 7 (15%) Australians have arthritis (ABS, 2018). According to the most recent Victorian data from 2019, 1 in 5 (20%) adults reported having been diagnosed with arthritis (VAHI, 2021b).

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Mental health

Mental health affects and is affected 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 chapter includes:

- mental illness and mental wellbeing
- mental health impacts of the COVID-19 pandemic
- supporting Victorians through crisis
- mental health system review and reform
- initiatives under the Victorian *Suicide prevention framework*.

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 that can contribute to mental wellbeing.

For example, in 2020, 76.5% of Victorians reported that they had very high or high satisfaction with life (VAHI, 2022). However, 1 in 5 Victorians will experience a mental health condition each year, and 45% of Victorians will experience one during their lifetime (ABS, 2008).



**1 in 5
Victorians**

will experience a mental health condition each year, and 45% of Victorians will experience one during their lifetime

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 and 2018 (AIHW, 2021).

Depression and anxiety

Overall, 31.8% of Victorian adults in 2020 reported that they had been diagnosed with depression or anxiety by a doctor during their lifetime. This figure was significantly higher in females (38.2%) than males (25.1%) (VAHI, 2022).

The proportion of adults reporting a diagnosis of depression or anxiety was similar between the ages 18 and 44. The proportion of adults who were 45 to 54 years of age reported a diagnosis of anxiety or depression that was significantly higher than the proportion in all adults in Victoria. Adults aged 65 years or older were less likely to report having been diagnosed with depression or anxiety during their lifetime compared with other age groups (VAHI, 2022).

The lifetime prevalence of self-reported doctor-diagnosed depression or anxiety increased significantly for both males and females between 2015 and 2020 (VAHI, 2022).

Psychological distress

In 2020, 23.5% of Victorian adults experienced high or very high levels of psychological distress. Rates of psychological distress were significantly higher in females (27.5%) than males (19.4%) (VAHI, 2022).

Very high levels of psychological distress were significantly higher in men and women who (VAHI, 2022):

- had only completed Year 9 at school, or less
- were unemployed or not in the labour force
- were widowed, divorced, separated or never married, or
- had a total annual household income of less than \$40,000.

Thirty-one per cent of Aboriginal respondents in the 2018–19 National Aboriginal and Torres Strait Islander health survey reported high or very high psychological distress. That is nearly 3 times that of the non-Aboriginal rate at 13% over the same period (ABS, 2019a).

While Victorian-specific data for young people is not available for this reporting period, in Australia in 2020, over a quarter (26.6%) of young people reported experiencing psychological distress (Mission Australia, 2021). Rates of psychological distress were significantly higher in females (34.1%) than males (15.3%) (Mission Australia, 2021). Rates of psychological distress were also higher in Aboriginal young people (34%) than they were in non-Aboriginal young people (26.2%) (Mission Australia, 2021).

Social isolation and loneliness

In 2020, 22% of Australians experienced loneliness (AIHW, 2021). 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).

Social isolation and loneliness can occur across the community but can be more prevalent in certain groups including (Commissioner for Senior Victorians, 2016):

- older people
- those from lower socioeconomic groups
- Aboriginal people
- people who speak a language other than English at home
- people living with 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.

The COVID-19 pandemic affected mental health, including social isolation and loneliness, for many community members. This is discussed in more detail below.

Lived experience of suicide

There was a slight decrease in the suicide rate in Victoria in 2020, at 10.0 per 100,000 population, compared with 11.1 per 100,000 population in 2019 (AIHW, 2024). The corresponding figures per 100,000 population in selected jurisdictions were: Northern Territory: 20.2 in 2020 and 20.8 in 2019; New South Wales: 11.0 in 2020 and 11.8 in 2019; Tasmania: 15.2 in 2020 and 18.8 in 2019 (AIHW, 2024).

According to the Australian Bureau of Statistics, in 2020–2022, 1 in 6 Australians aged 16 to 85 years had experienced suicidal thoughts or behaviours at some point in their life (ABS, 2023).

Suicidal behaviour is complex, with many influencing factors. Dealing with stressful or traumatic past or present events, death, separation, loss, bullying, mental ill-health and substance abuse can play a role in causing emotional pain. Other factors may include life-changing events, family history and relationships, work, education and social pressures (ABS, 2022). Suicide can also have a profound emotional effect not only on family and friends but on the whole community.

National rates of suicide among Aboriginal Australians are higher than those of the non-Aboriginal population. For the 5 years from 2014 to 2018, the age-standardised suicide rate for Aboriginal Australians was almost twice that of the non-Aboriginal population (23.7 vs 12.3 per 100,000 population) (ABS, 2019b).

Support services



**Support services are available
24 hours a day, 7 days a week from:**

Lifeline

<<https://www.lifeline.org.au/>>
13 11 14

Suicide Call Back Service

<<https://www.suicidecallbackservice.org.au/>> 1300 659 467

Kids Helpline

<<https://www.kidshelpline.com.au/>>:
1800 551 800 (for people aged 5 to 25 years)

MensLine Australia

<<https://mensline.org.au/>>
1300 789 978

StandBy – Support After Suicide

<<https://standbysupport.com.au/>>
1300 727 247.

Seeking professional help for a mental health problem

In 2020 and 2021, the overall proportion of Australians aged 16 to 85 years who sought professional help for a mental health-related problem in the preceding 12 months was 17.4% (ABS, 2023). This proportion was significantly lower in men (12.9%) than women (21.6%) (ABS, 2023).

About 23% of Australians aged 16 to 34 years saw a health professional for their mental health, compared with 17.4% of people aged 35 to 64 years and 8.1% of people aged 65 to 85 years (ABS, 2023).

Mental health impact of the COVID-19 pandemic

Overview of the pandemic impact

The pandemic took hold in early 2020 and changed the way Victorians of all ages lived their lives. This affected people in many ways, including mental health and how public mental health services were delivered. There was a disproportionate impact on the mental health of children and young people (Department of Health, 2021).

The Australian Bureau of Statistics found in June 2021 that almost 1 in 3 (30%) younger Australians aged 18 to 34 years experienced high or very high levels of psychological distress (ABS, 2021). In comparison, 18% of people aged 35 to 64 years and 10% of people aged 65 or older experienced high or very high levels of psychological distress (ABS, 2021). The bureau found that more people living in Victoria in June 2021 (27%) experienced high or very high levels of psychological distress compared with the rest of Australia (18%) (ABS, 2021). For consent reasons, children are often excluded from population health surveys, so data on children and young people aged under 18 is less available than data for adults. However, the survey found that around half (48%) of all people who reported having a mental health condition experienced high or very high levels of psychological distress compared with 16% who did not have such a condition (Tiller et al., 2020).

Measures taken to control the pandemic, such as restrictions on movement and activity, saved lives by preventing the spread of infectious disease (Department of Health, 2021). However, some of these measures, such as learning from home and reduced opportunities to socialise, caused acute anxiety and stress in young people (Cowie and Myers, 2021).

This may have been exacerbated by excessive use of electronic and social media. Loss of predictable structure and routines, and lack of social connectedness with friends, can be substantial issues for young people (Nearchou et al., 2020). Consequent loneliness cannot necessarily be mitigated by using phones or other forms of communication (Ellis et al., 2020). Loneliness is a risk factor for mental ill-health, as well as being distressing in its own right (AIHW, 2021).

In looking at clinical mental health data for the year, the effects of the pandemic were evident. During public health restrictions, Victorians deferred seeking treatment and care for a broad range of medical conditions, including mental illness (Department of Health, 2021). Overall, the total number of emergency department presentations for all reasons reduced in 2020–21 compared with the previous year (Department of Health, 2021). On 30 June 2020 a return to stage 3 stay-at-home restrictions was announced, so the 2020–2021 financial year began with restrictions in place in Victoria. Restrictions, which became more severe, stayed in place for months. They eased on 28 October 2020 and again on 8 November 2020. Subsequently there were other outbreaks of COVID-19, resulting in further periods of restrictions.

The potential for the pandemic to affect mental health and wellbeing was recognised early (Department of Health, 2021). Apart from concerns about contracting the virus, some of the measures necessary to contain its spread were also likely to have a negative impact on mental health (National Mental Health Commission, 2020). From March 2020, widespread restrictions of movement, physical distancing measures and physical isolation were put in place. Sudden loss of employment and social interaction, and the added stressors of moving to working and learning from home, affected the mental health of many Victorians (Department of Health, 2021).

There was a sharp and statistically significant increase in psychological distress among adults in Victoria, and also among Aboriginal and LGBTIQ+ Victorians. Older people (65+ years of age) continued to report significantly lower levels (14.2%) of high or very high psychological distress compared with the proportion in all adults (23.5%) (Department of Health, 2021). The proportion of adults with high or very high levels of psychological distress was not significantly different in people who spoke a language other than English at home (23.3%) or rural Victorians (22.0%) (Department of Health, 2021). Psychological distress is a risk factor for a number of diseases and conditions, including cardiovascular disease, chronic obstructive pulmonary disease, injury, obesity and depression (Department of Health, 2021).

During the pandemic, the Australian Bureau of Statistics and several universities conducted surveys to examine the impact of the pandemic on the mental health of Australians. These surveys showed changes over time in the levels of distress in the population. This is not surprising; at times case numbers dropped and people's lives and occupations began to return to normal. There was some evidence that rates of mental distress had a similar pattern to financial stress over the course of the pandemic (Melbourne Institute, 2020).

The proportion of children at school entry at high risk of clinically significant problems related to behaviour and emotional wellbeing trended slightly upwards from 2018 data (Department of Health, 2021). It is possible this related to the pandemic and to disruptions to early childhood education and families.

Supporting Victorians through crisis

The effects of bushfires from the summer of 2019–2020 were still being felt when the COVID-19 pandemic started in early 2020. The bushfires and the pandemic presented a number of mental health challenges for Victorians (Department of Health, 2021).

Victoria's mental health system aimed to respond to the needs of Victorians throughout this period, with a focus on building both mental health capacity and resilience (Department of Health, 2021).

Staff in our mental health services and the wider system worked hard to continue to provide services to consumers while ensuring COVID-19 infection control and preventive health measures were in place to protect the wellbeing of consumers, carers and staff. Many services were delivered via telehealth. Service models were developed to meet local needs (including dealing with outbreaks) and to address both the effects of different restrictions across the state (Department of Health, 2021).

Investment in mental health service delivery

Crisis lines are often a first point of contact for Victorians experiencing distress. Others may contact primary care services, such as general practitioners, or need assistance from the state's public mental health services (Department of Health, 2021).

Beyond Blue continued its pandemic-specific telephone counselling service to deal with the expected increase in demand for services. With funding provided in the April 2020 pandemic package, the Beyond Blue phone line handled more than 98,000 calls, and Lifeline Australia received in excess of 330,000 calls across 2020–21 (Department of Health, 2021).

More than \$220 million was allocated to address mental health and wellbeing during the pandemic, both across the whole population and to targeted groups (Department of Health, 2021). As part of this investment, in August 2020, the Victorian Government committed \$59.7 million for clinical mental health services to meet immediate surge demands resulting from introducing stage 4 restrictions in metropolitan Melbourne and the return to stage 3 restrictions in regional areas (Department of Health, 2021).

The investment meant that:

- More than 4,000 asylum seekers were supported through the Asylum Seeker Resource Centre, Cabrini and Foundation House.
- The Victorian Aboriginal Health Service managed the Yarning Safe and Strong telephone helpline. The line focused on the social and emotional wellbeing of Aboriginal Victorians and connected callers with health, family violence, housing and legal services in emergencies.
- Orygen continued developing its Moderated Online Social Therapy platform, with an added feature that allowed the platform to reach all young people in Victoria following a referral from headspace or a tertiary mental health service.
- Ambulance Victoria boosted the Tele-PROMPT program, and the pilot was subsequently recognised through receiving the Leadership Award from the Institute of Public Administration Australia Victoria.
- The Victorian Mental Illness Awareness Council and Tandem, Victoria's peak body for mental health carers, were supported to meet extra demand (Department of Health, 2021).

Mental health system review and reform

Against the backdrop of significant disruption due to the pandemic in 2020–21, reform of Victoria's mental health system continued, most importantly with the conclusion of the Royal Commission into Victoria's Mental Health System (Department of Health, 2021).

Royal Commission's final report

The final report and recommendations of the Royal Commission into Victoria's Mental Health System were tabled on 2 March 2021 in a historic special sitting of the Victorian Parliament at the Royal Exhibition Building (Department of Health, 2021; 2022).

The Royal Commission was established in February 2019 and undertook a landmark review of Victoria's mental health system. It provided a comprehensive set of recommendations on how best to support the mental health and wellbeing of Victorians into the future. The final report addressed the reform needed in specialist mental health care as well as recognising the importance of homes, schools, workplaces and communities in supporting mental health. The involvement of, and engagement with, consumers, carers, families and supporters were a key part of the process (Department of Health, 2021).

The government committed to implementing all 65 recommendations from the final report, together with the 9 recommendations from the interim report. The recommendations set out a 10-year vision for a future mental health system where people can access coordinated, high-quality treatment close to their homes and in their communities (Department of Health, 2022).

Mental Health Reform Victoria

Mental Health Reform Victoria was established in February 2020 to operate for a time-limited period, implementing 7 of the Royal Commission's 9 interim recommendations. During 2020–21 several key recommendations from the interim report were progressed (Department of Health, 2021; 2022) including:

- co-design for the lived experience residential service
- planning for an Aboriginal social and emotional wellbeing centre, with initial staff appointed and 4 lapsing Social and Emotional Wellbeing Teams funded
- Hospital Outreach Post-suicidal Engagement program expansion (detailed later in this chapter)
- lived experience peer (carers and consumers) workforce cadets piloted across 6 community organisations
- lived experience workforce organisational readiness, framework development
- lived experience-led quality and experience data collection pilot
- phase 1 development of a standardised training package for the lived experience workforce
- review of the Certificate IV in mental health peer work and development of a student supervision framework for lived experience workers
- Lived Experience Workforces Leadership Pathways and Development package
- increasing psychiatry rotations for junior medical officers
- increasing graduate mental health nursing positions
- development of a foundational allied health graduate program model to support extra allied health positions

- improving workforce data capabilities, beginning with a workforce census and survey
- planning for a broad, multidisciplinary and collaborative leadership network
- postgraduate scholarships for mental health nurse education, with 124 postgraduate nurse scholarships awarded in 2021.

At the start of 2021 Mental Health Reform Victoria merged with the department's then Mental Health and Drugs branch to become a new Mental Health and Wellbeing Division (Department of Health, 2021; 2022).

Increased investment in mental health reform

The Royal Commission's interim report recommended reviewing, reforming and implementing multidisciplinary care for bed-based services in a range of settings, including a person's home and fit-for-purpose hospital settings. The Commission's interim report recommended providing more youth and adult acute mental health beds to help address critical demand pressures (Department of Health, 2021).

The State Budget 2020–21 included \$868.6 million for reform and development – the biggest mental health investment in the state's history at the time. The funding included \$492 million for 120 mental health beds in Geelong, Epping, Sunshine and Melbourne. The construction of extra mental health beds included (Department of Health, 2022):

- a 16-bed mental health facility at the McKellar Centre in Geelong
- a 30-bed mental health facility at Northern Hospital in Epping
- a 52-bed mental health facility at Sunshine Hospital in St Albans
- 22 more mental health beds at The Royal Melbourne Hospital in Parkville.

The 2020–21 funding also included support for designing and implementing a mental health Hospital in the Home (HiTH) program, a new service for consumers who were experiencing acute mental ill-health (Department of Health, 2021). It provided care in the patient’s home or usual place of residence that would otherwise need to be delivered in a hospital. Mental Health HiTH was a 24-hour service delivering a multidisciplinary approach to care while focusing on the psychosocial needs of consumers, families, carers and supporters (Department of Health, 2021).

Orygen Youth Health, in partnership with Melbourne Health, provided 15 of these beds with a focus on young people. The first 6 of these youth HiTH beds opened in December 2020. The remaining 9 beds for adults are at Barwon Health, with the first of these beds opening in March 2021 (Department of Health, 2021; 2022).

Initiatives under the Victorian suicide prevention framework

The *Victorian suicide prevention framework 2016–2025* provides a government commitment and coordinated strategy to reduce the rate of suicide, with the goal of halving Victoria’s suicide rate by 2025. The framework reflects a broad public health approach to suicide prevention and is based on the principle that, while the reasons for suicide are complex, suicide is preventable (Department of Health, 2021; 2022).

The framework outlines 2 major initiatives: the rollout of the HOPE program and place-based suicide prevention trials.

Hospital Outreach Post-suicide Engagement (HOPE) program

The HOPE program offers assertive, tailored outreach support for a 3-month period to people who are at significant risk of suicide following hospital discharge for a suicide attempt.

The program’s objectives are to:

- improve recovery outcomes
- provide community-based support to help build self-resilience and capacity to self-manage distress and other risk factors for suicidality
- improve workforce capacity and capability.

The program was designed to fill a gap in the mental health system where people sometimes had little or no follow-up care after presenting to an emergency department with suicidal concerns (Department of Health, 2021).

It was initially funded in 6 area mental health services across Victoria as part of the 2016–17 Victorian State Budget. The initiative was expanded to another 6 health services in 2019 as part of the 2018–19 State Budget (Department of Health, 2021).

State Budget investment of \$27.3 million in 2020–21, followed by another \$159.9 million in 2021–22, has supported the statewide expansion of the HOPE program (Department of Health, 2021; 2022). HOPE is now operating in all 21 area mental health services, with outreach from regional HOPE teams to their subregional areas. Broader access was also set up through enhanced referral pathways and extended service hours (Department of Health, 2022).

The 2021–22 State Budget provided \$16 million as part of the total \$159.9 million HOPE expansion investment to design and deliver the 4 Child and Youth HOPE services (Department of Health, 2022). The new funding also helped improve the program's design including broader referral pathways into the service, extended hours of services and a new HOPE service for children and young people, in partnership with 4 health providers. The new child and youth HOPE services are informed by the experiences of children and young people, and their carers and families (Department of Health, 2022). In 2020 and 2021, the new Child and Youth HOPE service ran at Royal Children's Hospital, Monash Children's Hospital, Alfred Health and Orygen.

In May 2021 the Victorian and Commonwealth governments entered into an expanded bilateral agreement for suicide attempt aftercare services, under which the Commonwealth matched Victorian investments in HOPE with another 4 Way Back Support Services (Department of Health, 2021). This built on the 4 Way Back sites the Commonwealth funded when the bilateral agreements began in June 2019, expanding suicide attempt aftercare to 29 sites across Victoria (Department of Health, 2022).

The Way Back Support Service is a non-clinical support service developed by Beyond Blue. It offers practical psychosocial support to people experiencing a suicidal crisis or who have attempted suicide for up to 3 months after discharge from hospital (Department of Health, 2021).

Place-based suicide prevention trials

Place-based suicide prevention trials continued to be delivered through partnerships and co-investment with Primary Health Networks in 12 locations across Victoria in 2020 and 2021 (Department of Health, 2021).

Using a community development model, each trial used a range of evidence-based suicide prevention strategies to recognise and respond to signs of suicidality. Several Primary Health Networks were implementing geographic expansions of trial sites in their catchments based on achievements in their trial sites (Department of Health, 2021).

Preliminary findings from the trials and subsequent evaluation were positive and suggested improvement over time in local suicide prevention systems and capacity. System improvements have occurred in relation to:

- partnerships and collaboration
- care integration and coordination
- prioritising suicide prevention (Department of Health, 2021; 2022).

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Injury prevention

Injury prevention – chapter overview

Injury is a complex public health issue that covers a broad range of causes. These include **unintentional/accidental injury** from falls, transport, sport and recreation, poisoning, drowning, burns and consumer products. Injury may also be **intentional** due to suicide, self-harm and all forms of violence.

This chapter includes summarised data on the major causes of injury hospitalisations and deaths that occurred in the 2-year period of 2020 and 2021 in Victoria. It also provides injury prevention information for Victorians for 2 of the major injury causes: falls and family violence.

Impact of injury

Injury continues to have a significant impact on the health, wellbeing and safety of Victorians and can affect Victorians of all ages. Injuries can be fatal. The impact of injury and associated harms can be long term and profound for individuals, families and communities. It may result in physical and psychological impairment and disability, loss of income and productivity, reduced social participation and increased dependency. Injury can also affect a person's perception of safety, activities of daily living and quality of life.

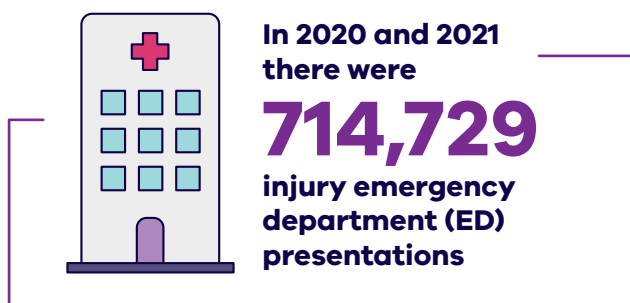
Burden of injury

Injuries are the sixth leading health condition, contributing to 8.1% of the burden of disease in Australia, after cancer, mental illness, musculoskeletal conditions, heart disease and dementia (AIHW, 2023a). Injury is a major cause of hospitalisation and death in Victoria (VISU, 2024a; VISU, 2024b).

Injury hospitalisations and deaths

In the 2 years January 2020 to December 2021, Victoria recorded (VISU, 2024):

- 714,729 injury emergency department (ED) presentations, at an average annual rate of 6,399.85 per 100,000 for males and 4,617.7 per 100,000 for females
- 262,166 injury admissions, at an annual rate of 2,060.5 per 100,000 for males and 1,718.15 per 100,000 for females
- 6,183 injury deaths, at an average annual rate of 49.55 per 100,000 for males and 30.4 per 100,000 for females.



Males made up a higher proportion of injury hospitalisations and deaths than females (Figure 30), accounting for 57.3% of injury ED presentations, 53.5% of hospital admissions and 61.6% of injury deaths (VISU, 2024a; VISU, 2024b).

Injury affected all age groups (Figure 31). The highest proportion of injury hospitalisations (43.1% of ED presentations and 42.1% of admissions) was among adult Victorians aged 25 to 64 years, while the highest proportion of injury deaths (55.3%) was among older Victorians aged 65 years or older. All injury rates increased with age, especially injury admissions for females.

The most common type of hospitalised injuries were fractures (20.3% ED presentations and 37.6% hospital admissions) and open wounds (16.6% ED presentations and 16.9% admissions) to upper limbs in the youngest age group and to lower limbs in the oldest age group. Injury deaths were most commonly associated with head injuries and fractures.

The home was the most common location of hospitalised injury (45.6% ED presentations and 31.4% hospital admissions), followed by roads/streets/highways (6% ED presentations and 9.9% admissions).

Figure 30: Injury incidence of hospitalisation and deaths by sex, 2020–2021

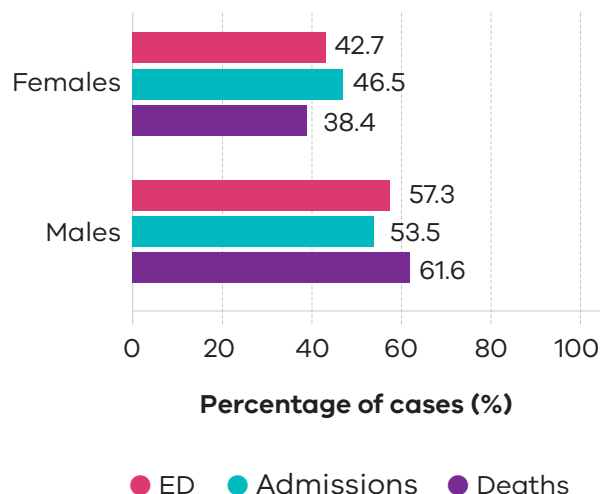
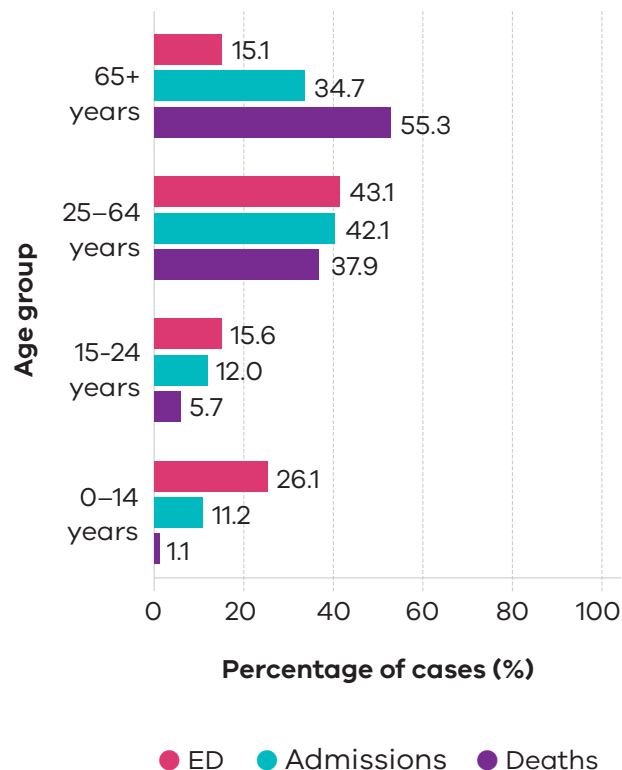


Figure 31: Injury incidence of hospitalisation and deaths by age, 2020–2021



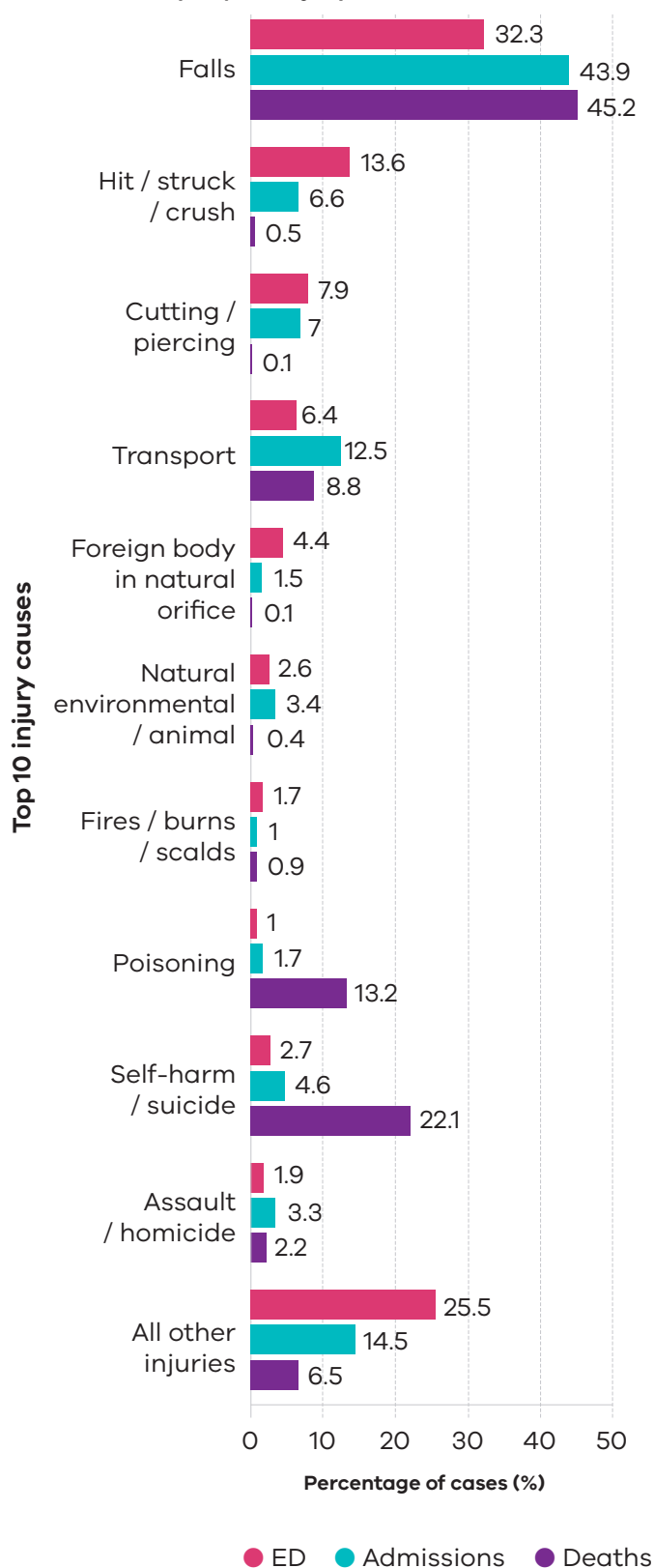
Main causes of injury

Data from the Victorian Injury Surveillance Unit showed that the vast majority of injuries in Victoria across 2020 and 2021 were classified as unintentional/accidental, and these contributed to 87.2% of ED presentations, 90.8% of hospital admissions and 74.8% of injury deaths (VISU, 2024a; VISU 2024b). Intentional injuries (such as self-harm/suicide and assault/homicide) contributed to 4.5% of ED presentations, 8.0% of hospital admissions and 24.5% of injury deaths.

The leading causes of injury ED presentations were falls (32.3%), hit/struck/crush (13.6%) and cutting/piercing (7.9%) (Figure 32) (VISU, 2024a). The leading causes of injury hospital admissions were falls (43.9%) and transport accidents (12.5%). The top 3 causes of injury deaths were falls (45.2%), self-harm/suicide (22.1%) and unintentional poisonings (13.2%) (VISU, 2024b).

Overall, falls were the leading cause of unintentional injury burden in Victoria in 2020 and 2021, accounting for 32.3% of ED presentations, 43.9% of hospital admissions and 45.2% of deaths (Figure 32) (VISU, 2024a; VISU, 2024b). Self-harm/suicide was the leading cause of intentional injury burden, accounting for 2.7% of ED presentations, 4.6% of hospital admissions and 22.1% of injury deaths.

Figure 32: Injury incidence of hospitalisation and deaths by top 10 injury causes, 2020–2021



Cost of injury in Victoria

In 2020–21, health costs attributable to injury in Australia were reported to be fourth highest of all disease groups, accounting for 7.3% (\$11 billion) of the total direct costs of all diseases annually (AIHW, 2023b). Injury ranked second highest for spending on public hospital admissions of \$4.9 billion, with the bulk occurring for falls among older females in the 70 to 74 years age group.

Data for Victoria in 2020–21 estimated the total cost of hospital spending on injuries was \$1.22 billion, with an average hospital stay costing \$9,060 (VISU, 2024c). Injury-related hospital costs were highest in older age groups, with older Victorians aged 75 years or older accounting for 37% of costs. Males under 65 years of age incurred higher hospital costs, while this pattern reversed after 65 years of age, with older women aged 65 years or older incurring 31% of all injury hospital costs.

Hospital spending was greatest for falls injury (\$676.8 million, 59%), transport (\$161.1 million, 14%) and cutting/piercing (\$49.7 million, 4.4%), while intentional self-harm cost \$40.8 million (3.3%) and assault injury cost \$27.6 million (2.3%) (VISU, 2024c). An estimated 80% of injury admission costs were in Victorian public hospitals and 20% in Victorian private hospitals. Over the 5-year period from 2016–17 to 2020–21 injury admission costs increased from \$875.1 million to \$1.22 billion. This increase was due to increased costs per injury hospital stay, rather than increased rates of injury admissions.

Injury trends over time

Injury hospitalisation and death rates are increasing

Trend analysis of injury since 2011–12 in Victoria indicates age-standardised rates of injury ED presentations were stable to 2020–21. However, since then, the age-standardised rates of injury hospital admissions showed a significant annual increase of 3.1%, as shown in Figures 33 and 34 (VISU, 2022).

Age-standardised rates of injury death increased between 2018 and 2021 (Figure 35) for males (from 42.6 per 100,000 to 49.5 per 100,000) as well as for females (from 26.2 per 100,000 to 31.3 per 100,000). However, this upward pattern needs to be interpreted with caution due to technical limitations of the source data from the Australian Bureau of Statistics, which are subject to revisions (VISU, 2024b). For example, injury deaths for 2018 and 2019 are final, are revised for 2020 and are preliminary for 2021.

Figure 33: Trend in injury emergency department presentation rates per 100,000 population, Victoria, 2011–12 to 2020–21

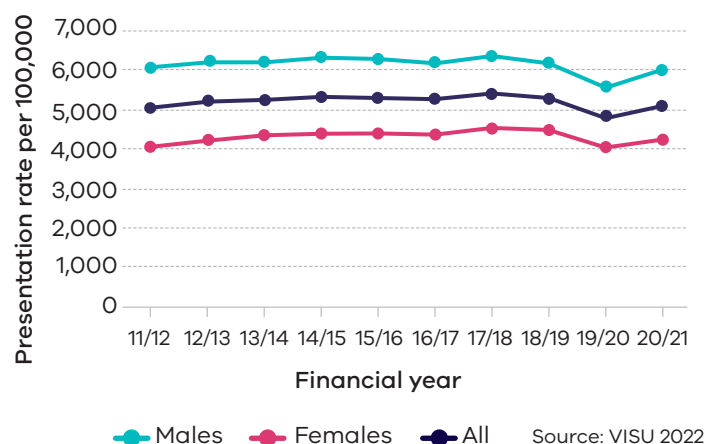


Figure 34: Trend in injury hospital admission rates per 100,000 population, Victoria, 2011–12 to 2020–21

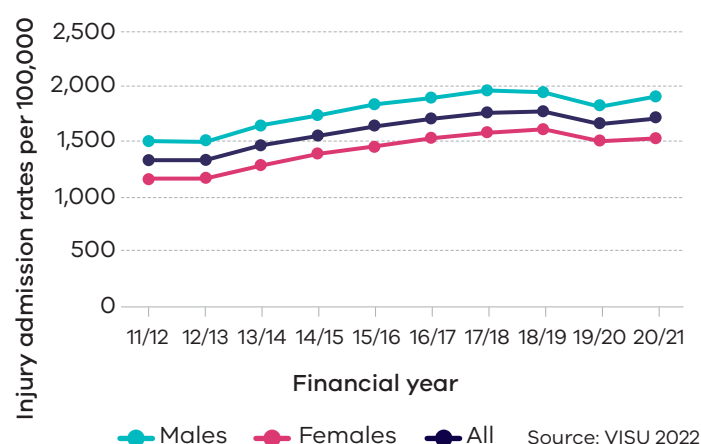
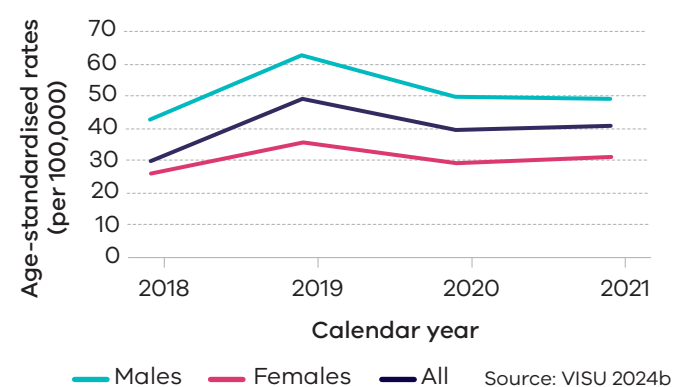


Figure 35: Trend in injury death age-standardised rates per 100,000, Victoria, 2018–2021



Injury survival rates are improving

The survival of hospital-admitted injuries has improved significantly over time in Victoria, despite ageing of the injured population (Berecki-Gisolf et al., 2023). Specifically, rates of in-hospital deaths as an outcome of injury hospitalisation in Victoria have reduced by 28% over the past 20 years (2001–2021) across all injury types and all age groups, which amount to 1,222 more lives saved in 2020–21 alone.

Likely contributors to increased injury survival in Victoria include (Gabbe et al., 2015):

- improvements in patient care
- advances in medical technology
- improvements in the Victorian State Trauma System to enhance regionalised trauma care
- improvements in the underlying health of the population in terms of management of chronic conditions.

COVID-19 impacts on injury

The COVID-19 pandemic and associated periods of public health restrictions, stay-at-home orders and limitations on movement in Victoria during 2020 and 2021 had a marked impact on Victorians' exposure to injury risk and incidence patterns across settings. This was especially the case in home and local parks/nature environments, roads/streets and workplaces. These patterns are described further below.

Data from the Victorian Injury Surveillance Unit showed periods of major restrictions in Victoria were associated with some reductions in monthly incidence of hospitalisations and deaths due to injury (Figures 36 and 37) (VISU, 2023), but these trends are approximate because they do not account for regional and metropolitan differences in periods of restrictions.

In particular, the number of ED presentations due to injury reduced in Victoria from 416,627 in pre-COVID years (2017–18 to 2018–19) to 391,969 during COVID-19 (2019–20 to 2020–21) (VISU, 2023). This corresponded with age-standardised annual rates of 6,541 and 6,016 per 100,000 population respectively. The home was the most common location of injuries leading to ED presentations, which may reflect the stay-at-home-orders during much of the pandemic. Table 26 describes the COVID-19 impact on ED presentation rates for specific injury causes.

Table 26: Changes in rates of emergency department presentations for injury

	Significantly increased unintentional injury in the home, mainly due to increased falls among children and adults, while falls among older adults decreased
	Significantly reduced work-related injury, particularly in trade, service, industrial and construction locations, while work-related injury at home increased
	Stable rates of farm injury overall, but some increases in farm-related transport, falls and farm-machinery related injuries
	Significantly reduced sport injury, particularly among children and young people
	Increased intentional self-harm injury at home, most commonly due to intentional poisoning among young females
	Significantly increased intentional assaults in the home among adults
	Variable rates of transport injury overall, with significantly reduced motor-vehicle-related injury and pedestrian injury, but significantly increased pedal cycling injury

The Melbourne Academic Centre for Health reported similar COVID-19 impacts on falls, transport and self-harm injury ED presentations, and reported an increase in ED presentations for eye injuries among adults (MACH, 2021). This may have been associated with Victorians spending more time at home doing gardening and DIY tasks involving chemicals and building materials.

COVID-19 impacts on transport-related injuries were considerable, but the Monash University Accident Research Centre reported that reductions in road transport exposure during COVID-19 years 2020 and 2021 did not directly translate into reductions in road trauma in Victoria (D'Elia et al., 2022).

Key observations of COVID-19 impacts on transport injuries reported by the Victorian Road Safety Partners to the Legislative Assembly Economy and Infrastructure Committee Inquiry into the impact of road safety behaviours on vulnerable road users included (VRSP, 2023):

- increased road trauma fatalities and collisions per 10,000 vehicles on the road
- changes in transport mode on driving, walking and cycling during COVID-19, with reduced travel exposure and traffic volumes and reduced public transport usage
- increased risk-taking behaviours among drivers such as speeding, driving without a seatbelt, alcohol consumption and drug driving
- decreased number of Victorians who walked and reduced pedestrian fatal and severe injuries and ED presentations in 2020
- increased cycling-related injury hospital admissions during COVID-19 but fewer cycling crashes, reflecting fewer vehicles on the road and fewer bicycle crashes involving a motor vehicle
- increased e-scooter usage and associated ED presentations, most likely due to increased community exposure to the Melbourne e-scooter trial and private ownership.

The Royal Children's Hospital reported impacts on child injury during periods of restrictions included an overall 15% reduction in paediatric trauma but a 40% increase in child injuries sustained at home. They also observed a reduction of sporting injuries among children but substantially more injuries related to bicycles and motorbikes and from severe burns (Palmer and Teague, 2021).

Poisoning injury hospitalisation and death rates were reported to increase by 17% in Australia from 2019–20 to 2020–21 (AIHW, 2023c) with unintentional poisonings making up 1.6% of injury hospitalisations and 9.8% of injury deaths. Poisoning hospitalisations were most commonly associated with pharmaceutical drugs and alcohol (85% and 10% respectively). In Victoria, the Poisons Information Centre also reported that topical antiseptics, hand sanitisers and other disinfectants and cleaning products were associated with a doubling of unintentional oral and ocular exposure among children under 5 years of age (oral ingestion cases from 435 in 2019 to 882 in 2020, and ocular exposure from 20 in 2019 to 53 in 2020) (Norvill et al., 2022).

Life Saving Victoria data indicated periods of restrictions correlated with 61 drowning deaths in 2020–21, which was 21 more (40%) than the 10-year average, with 39% of these occurring at rivers/creeks/lakes/dams and 33% at beach/bay/ocean (LSV, 2021). The pattern for non-fatal drownings differed, with hospital admissions for near-drowning reduced from 335 in pre-COVID years (2017–18 to 2018–19) to 267 during COVID (2019–20 to 2020–21) (Berecki-Gisolf et al., 2024). Near-drowning rates were associated with younger age, male sex and regional/remote residence. Pool and bathtub near-drowning rates decreased with the onset of COVID-19 despite more time spent at home. This may be due to increased parental presence and supervision of children swimming and bathing at home during restriction periods.

Figure 36 reports on the monthly frequencies of injury-related hospitalisations across 2020 and 2021, while Figure 37 depicts the monthly frequencies of injury-related deaths.

Figure 36: Monthly frequencies of injury-related hospitalisations, 2020–2021

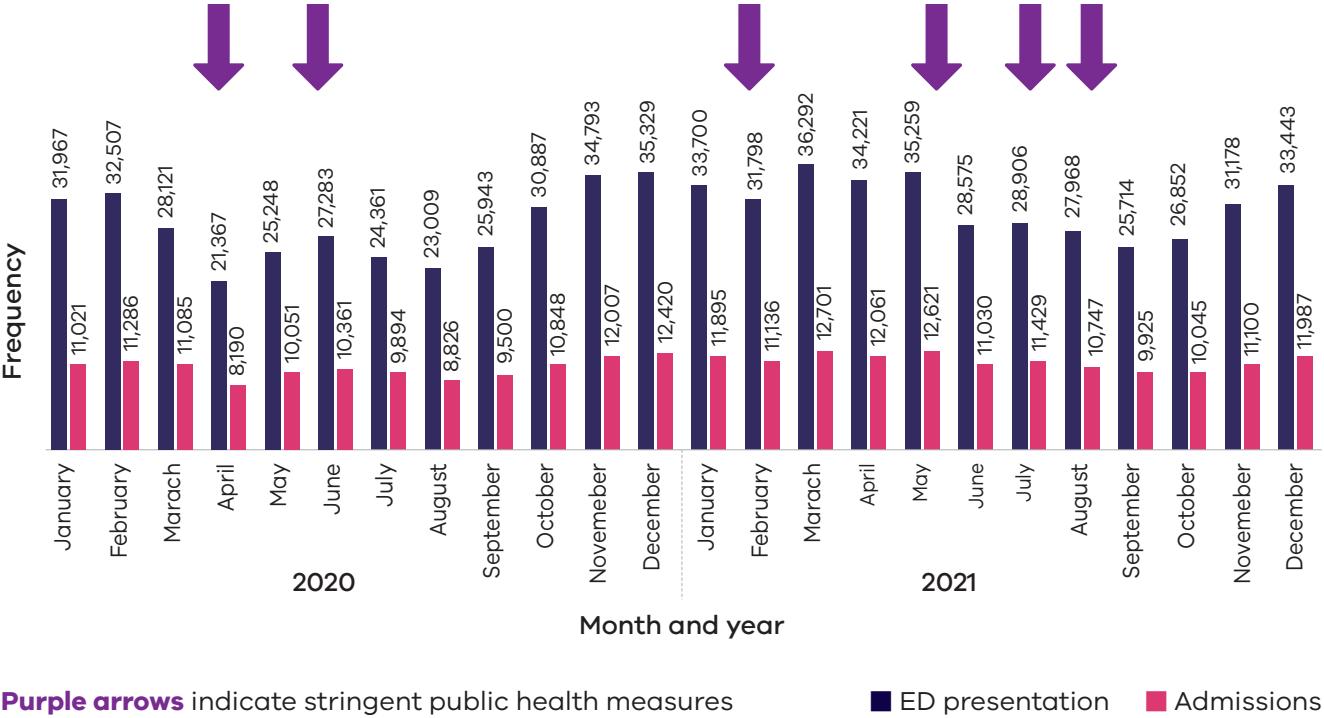
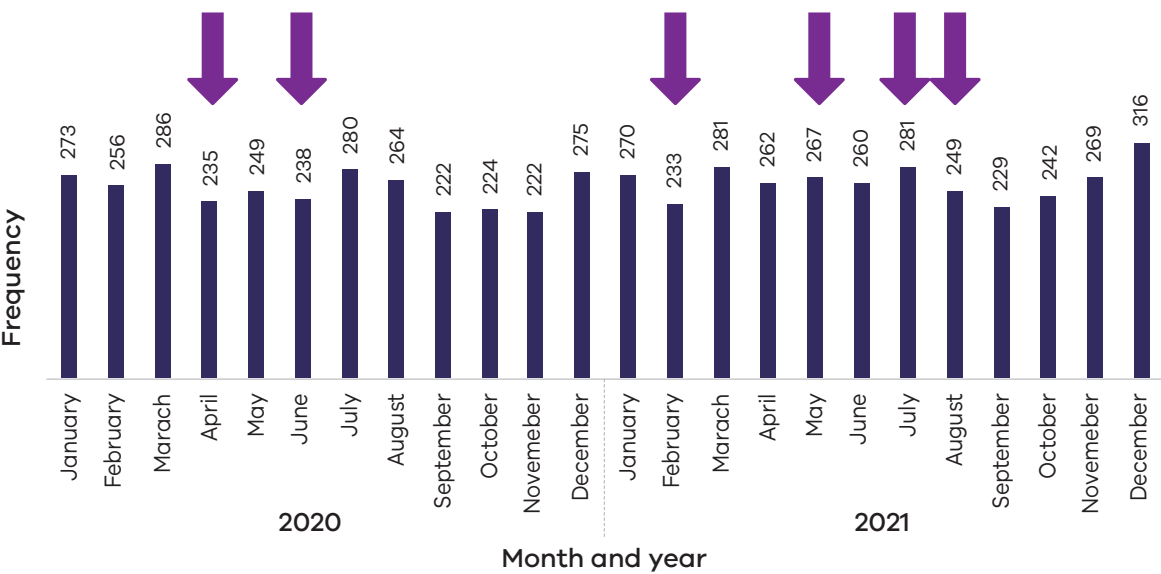


Figure 37: Monthly frequencies of injury-related deaths, 2020–2021



Implications for injury prevention

Injury is preventable and not inevitable. Effective evidence-based injury prevention measures identify injury risks and causes and remove or reduce people's exposure to those causes (WHO, 2007).

The *Victorian public health and wellbeing plan 2023–2027* includes reducing injury and preventing all forms of violence as 2 of its 10 priorities (Department of Health, 2023). This plan advocates for a strategic primary prevention and systems approach to injury in the community and informs municipal public health and wellbeing plans and Local Public Health Units' catchment plans.

The government's ongoing investment in the Victorian Injury Surveillance Unit provides world-leading injury data analytics and monitoring that inform injury prevention policy, programs and research. The Victorian Injury Surveillance Unit plays a key role in facilitating multisectoral and multidisciplinary action in injury prevention.

There are many examples of effective injury prevention initiatives across Victoria involving significant collaboration across multiple government sectors and community organisations. Targeted investment in child injury prevention, road safety and water safety over the past decade provide a model for delivering effective systems approaches at scale to impact on the whole Victorian population. However, fall-related injuries in older age, family violence, violence among young people, injuries among farming communities and injuries among Aboriginal people continue to pose significant challenges for effective responses to injuries in Victoria.

The following section highlights 2 of the most dominant causes of injury in Victoria – falls among older Victorians and family violence. It describes evidence-based opportunities for preventing them.

Focus 1: Falls prevention

Falls are a leading cause of unintentional injury hospitalisations, disability and death among older adults above 65 years in Australia and Victoria (AIHW, 2023d; VISU 2023; VISU, 2024a; VISU, 2024b).

One in 3 older adults fall each year, with 10% having multiple falls and more than 30% experiencing injuries requiring medical attention (Hill et al., 2004).

Falls hospitalisations and deaths

Falls are the leading cause of injury hospitalisations and deaths in Victoria. In 2020 and 2021, falls accounted for 32.3% of all injury ED presentations, 43.9% of all injury hospitalisation admissions and 45.2% of all injury-related deaths (Figure 32).

Falls disproportionately affect older women. Rates of falls hospitalisations were greatest among women aged 75 years or older, while rates of falls deaths were greatest among men aged 60 years or older (VISU, 2024a; VISU, 2024b). Falls can happen to anyone at any location, but falls most commonly occur among older adults living independently in the community, and most falls occur at home.

Trend indications show that rates of falls hospitalisation and death among older people continue to increase at 2–3% per year (VISU, 2022; VISU, 2024b), despite efforts to prevent falls in high-risk settings, including in the community, hospitals and residential aged care. Rates of falls injury hospitalisation are greater than rates of population ageing, suggesting low levels of physical activity and sedentary behaviour during adulthood may have long-term negative impacts in older age. While older males account for 70% of all falls deaths in Victoria, older females experience more frequent and more severe falls hospitalisations than males.

Impact of falls

The impact of falls injury and associated harms on the person, their family and society, as well as on the health system, can be considerable. Falls can lead to a dramatic loss of independence and may lead the older person to prematurely enter into residential aged care (ANZFPS, 2023; WHO, 2021).

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).

During COVID-19 in 2020 and 2021 in Victoria, there was a marked decrease of falls ED presentations, as well as a marked reduction of hip fracture-related admissions among older Victorians (Berecki-Gisolf, 2023). Emerging international research indicates this may have been in part due to older adults' reduced physical activity and increased social isolation during COVID-19 public health restrictions, delaying seeking medical care for falls due to fears of COVID-19 infection. This in turn may have other indirect and long-term negative impacts on mobility, mental health problems and reduced chronic disease management (Hill, 2023).

Key risk and protective factors for falls

A person's risk of falls and falls-related injury and harm are complex and multifactorial (ANZFPS, 2023; Close and Lord, 2022). The risk of falls increases with age, but falls are preventable and are not an inevitable part of ageing (WHO, 2021).

Other factors that increase the risk of falls include a history of falls, frailty, comorbidity (especially cardiac conditions, renal conditions, and diabetes), cognitive impairment and dementia, and inadequate physical activity.

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 (Andersen et al., 2020):

- reducing home slip and trip hazards through a home-safety assessment by an occupational therapist
- reducing psychotropic medications
- cataract surgery to improve vision
- maintaining bone health
- having regular optometry, podiatry and hearing checks.

Primary prevention of falls

The Victorian Government adopts a strategic primary prevention and systems approach to falls-related injury prevention among older Victorians (Department of Health, 2023). Falls injuries and associated harm from falls can be prevented by encouraging safe behaviours, facilitating safe environments and reducing hazards, as well as providing targeted community information alongside accessible health services for falls prevention and management.

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* (WHO, 2023), and by fostering social connectedness. 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 adults, referrals to local healthcare providers and aged care services.

Safe-built environments are important to enable older people to live and move around independently and remain physically active, and to ensure neighbourhoods and public spaces are safe, accessible, health-promoting and socially inclusive environments for older people (Department of Sustainability and Environment, 2005). Prioritising older people as vulnerable road users in designing local roads will reduce falls and transport-related injuries, as will supporting older people to adopt active modes of transport, like walking and cycling.

Local government and community organisation partnerships to enable older people to take part in physical activity are encouraged, such as providing seniors exercise parks, age-friendly walking paths and group exercise programs such as tai-chi. The Council on the Ageing's [Living Longer Living Stronger initiative](https://cotavic.org.au/our-programs/strength-training/living-longer-living-stronger/) <<https://cotavic.org.au/our-programs/strength-training/living-longer-living-stronger/>> offers links to local instructors of strength and balance programs.

What healthcare providers can do

Healthcare providers have an important role to play in openly discussing falls risk with older adults, identifying risk factors, and tailoring appropriate prevention strategies and referrals, as per recent global guidelines for falls prevention and management (Montero-Odasso et al., 2022) and [Australia and New Zealand Falls Prevention Society online resources](https://www.anzfallsprevention.org/resources/) <<https://www.anzfallsprevention.org/resources/>>. The Integrated Solutions for Sustainable Falls Prevention program provides [evidence-based online learning modules, tools and workshops for allied health practitioners and general practitioners](https://fallspreventiononlineworkshops.com.au/) <<https://fallspreventiononlineworkshops.com.au/>>.

Healthcare providers are encouraged to conduct falls-risk assessments with their older clients (such as the [FROP-COM](https://www.nari.net.au/frop-com) <<https://www.nari.net.au/frop-com>>) to enhance early intervention and referral to appropriate prevention strategies in the community. General practitioners are encouraged to conduct falls-risk assessments 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. The department's online resource [Older people in hospital](https://www.health.vic.gov.au/patient-care/older-people-in-hospital) <<https://www.health.vic.gov.au/patient-care/older-people-in-hospital>> and the [Falls Review Tool](https://www.safercare.vic.gov.au/best-practice-improvement/improvement-projects/older-people-and-palliative-care/falls-review-tool-pilot-project) <<https://www.safercare.vic.gov.au/best-practice-improvement/improvement-projects/older-people-and-palliative-care/falls-review-tool-pilot-project>> provide evidence-based information and simple strategies to manage falls in hospitals, and can assist health and aged care services to comply with the [National Aged Care Quality Standards](https://www.agedcarequality.gov.au/providers/quality-standards) <<https://www.agedcarequality.gov.au/providers/quality-standards>> and the [National Safety and Quality Health Services \(NSQHS\) Standards](https://www.safetyandquality.gov.au/standards/nsqhs-standards) <<https://www.safetyandquality.gov.au/standards/nsqhs-standards>>.

What older people can do

Older adults are encouraged to talk about all falls (including ones that didn't cause injury) with their partners, family, carers, GPs and other healthcare providers to help identify and address risk factors and to reduce the chance of repeat falls.

To prevent falls, older adults should maintain their physical activity and take part in regular strength and balance exercises in their own home or in group exercise and recreational settings. Go online for [videos on safe exercise at home for older adults](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 online booklet '[Don't Fall for It. Falls can be prevented!](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 adults can do themselves to self-manage their falls risk and prevention actions. The Better Health Channel provides advice to older people on [preventing falls at home](https://betterhealth.vic.gov.au/health/healthyliving/falls-prevention-at-home) <<https://betterhealth.vic.gov.au/health/healthyliving/falls-prevention-at-home>>, including what to do if you fall at home.

Older adults 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>> to access home maintenance assistance provided by local councils and local aged care service providers.

Focus 2: Family violence prevention

The Royal Commission into Family Violence revealed the devastating prevalence and impact of family violence across Victoria. It cuts lives short, inflicts unspeakable trauma, creates cycles of intergenerational trauma and violence and is extremely costly – to individuals, communities and governments (KPMG, 2017).

Ending family violence in Victoria requires a holistic, joined-up approach, sustained over a generation. This work is informed by victim survivors, and it takes place in our schools and hospitals, our courts and our community centres, across specialist family violence workforces.

Family violence incidents in Victoria

There has been a general trend of increased reporting of family violence incidents to police since 2016. This is in line with what we expected to see at this stage of our reforms. The COVID-19 pandemic has also likely affected the significantly higher numbers of incidents in 2020.

There were 91,144 family violence incidents in 2021, a 1.5% reduction on 2020, which recorded 92,513 incidents. Despite this modest decrease, the number of incidents in 2021 was still 7.8% higher than in 2019 (Crime Statistics Agency, 2019; 2020; 2021).

These year-on-year increases are likely to continue in these early stages of reform because community awareness is growing, women are beginning to feel safer and more confident in support systems, and, importantly, we are improving justice responses for victim survivors and holding perpetrators to account.

Significant progress has been made

In 2020 and 2021 we made significant progress in delivering the reforms outlined in *Ending family violence: Victoria's 10-year plan for change*, including:

- continuing to establish The Orange Door Network, a free service for adults, children and young people experiencing family violence, where they can access the support they need from a range of specialist services (2 new Orange Door sites opened in 2020 and another 6 in 2021)
- setting up another 3 Specialist Family Violence Courts, with 5 now in operation and plans for another 9 across Victoria
- constructing 349 new homes in line with the Big Housing Build and 9 new core and cluster refuges completed and operational by October 2021

- building a consistent approach to assessing and managing the risk of family violence, with more than 370,000 workers from across the health, education, justice and social service system now prescribed under the Multi-Agency Risk Assessment and Management framework (as at April 2021)
- programs to prevent family violence in places where Victorians live, work, learn and socialise
- more than 1,950 government, Catholic and independent schools signing on to a whole-school approach to Respectful Relationships
- high-impact public campaigns conducted by Respect Victoria to raise awareness of family violence and how to prevent it. Evaluation of these campaigns demonstrated a high level of community recognition and understanding of the key messages.

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Oral health

Oral health – chapter overview

Oral health is important for 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.

The burden of oral disease comes from 4 main conditions: tooth decay, gum disease, oral cancer and oral trauma (Department of Health, 2020). Oral diseases are among the most common and costly health problems Victorians experience. A total of \$3.2 billion was spent in Victoria on dental treatment in 2020–21. Individuals were responsible for 71% of the total cost of dental care (AIHW, 2023).

There have been significant improvements in oral health in Australia over the past 30 years. These improvements are largely due to better access to fluoridated drinking water, using fluoride toothpastes, providing preventive oral health services and adopting good oral hygiene practices (Do and Spencer, 2016).

However, certain population groups (people on low incomes, Aboriginal people, people living in regional and remote areas and people with extra or specialised healthcare needs) still experience significant oral disease, and the affordability of dental care is still an issue for some Victorians (AIHW, 2020; Australian Research Centre for Population Oral Health, 2019).

Note: Some content in this chapter is reflected in the 2019 *Your health* report. For the period of calendar years 2020 and 2021 the National Survey of Child Oral Health, Australia's oral health: National Study of Adult Oral Health 2017–18 and the Victorian Population Health Survey 2018 remain the latest analyses available.

Child oral health

Child dental caries (tooth decay) experience

Tooth decay is one of the most prevalent diseases in Victoria.

Almost half of all children (43%) aged between 5 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 aged 0 to 9 years, predominantly because of tooth decay (Department of Health, 2021).

There are 2 key pieces of data that illustrate the dental caries (tooth decay) experience of Victorian children. These data come from the National Survey of Child Oral Health, conducted in 2012–14 and published in 2016. It is anticipated that similar child oral health data will be collected in 2024–25.



Tooth decay is one of the most prevalent diseases in Victoria.

One piece of data relates to the average number of decayed, missing or filled (deciduous/baby) teeth (also known as a dmft score) in 5- and 6-year-old children. In 2012–14 Victorian 5- and 6-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 in 12-year-old children (also known as a DMFT score). 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 5- and 6-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 preschool children is needed 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 4 or more sugary foods/snacks every day (Do and Spencer, 2016).

The Smile Squad 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.

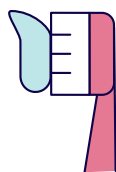
Adult oral health

Adult dental caries (tooth decay) experience

Adults also benefit from water fluoridation and fluoridated toothpastes.

Despite these advances, more than 90% of Victorian adults have had or currently have dental caries, with 1 in 3 (32%) experiencing untreated dental caries (Australian Research Centre for Population Oral Health, 2019). This 2019 study is the most recent study of adult oral health in Australia.

Adult dental caries experience increases with age (Australian Research Centre for Population Oral Health, 2019).



Adults also benefit from water fluoridation and fluoridated toothpastes.

Gum disease

Adults can also experience gum disease, which tends to affect adults more than children.

In 2017–18, 27.7% of Victorians were found to have moderate to severe periodontitis (gum disease), with more than 70% of those aged over 75 years of age experiencing moderate to severe periodontitis compared with 10.2% of Victorians aged between 15 and 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% of people rated their dental health as excellent or very good, while 34% rated their dental health as good. A further 24.4% rated their dental health as being fair or poor (Department of Health, 2018).

Oral and oropharyngeal (head and neck) cancer

Oral and oropharyngeal (also known as head and neck) cancer is one of the leading causes of disease burden in Victoria, with an average of 24 new diagnoses each week. In 2021 there were 1,266 new cases and 259 head and neck cancer deaths in Victoria (Cancer Council Victoria, 2022).

Head and neck cancer, which may affect the lips, tongue, salivary glands, gums, mouth or throat (oropharynx), was the seventh most common cancer in Victoria in 2021. It was the fifth most common cancer in men, the 11th most common cancer in women and was more common among older age groups (Cancer Council Victoria, 2022).

There was a 41% drop in pathology notifications relating to head and neck cancers (including oral and oropharyngeal cancers) during the COVID-19 pandemic in 2020. This was attributed to reduced access to dental and other primary healthcare services and patients deferring appointments during COVID-19 restrictions (Cancer Council Victoria, 2021).

The 3 most common oral and oropharyngeal cancers in 2022 were tongue, oropharynx and lip cancers (Cancer Council Victoria, 2021).

The risk of oral cancer is associated with lifestyle exposures such as tobacco, alcohol and human papillomavirus 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% of Victorians reported they had avoided or delayed visiting a dental professional due to cost (Department of Health, 2018).

The 2017–18 National Study of Adult Oral Health found that just over 57% of Victorian adults reported making a visit to a dentist in the 12 months preceding the study. The study also found that 23% of adults reported considerable difficulty paying a \$200 dental bill, and 1 in 5 adults reported foregoing recommended dental treatment due to cost (Australian Research Centre for Population Oral Health, 2019).

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).

Prevention and oral health promotion

In 2020–21 Smiles 4 Miles transitioned much of its program delivery and training online in response to the COVID-19 pandemic, enabling continued support to local community organisations and participating early childhood services. Smiles 4 Miles is a Dental Health Services Victoria initiative that works in partnership with community organisations to improve the oral health of preschool-aged children (0–5 years), their families and staff in early childhood services. For example, a key part of the program involves working with preschool services to introduce water and healthy food policies to promote oral health of young children. During this time, Smiles 4 Miles reached more than 51,000 children and their families across 750 early childhood services (Dental Health Services Victoria, 2021).



**Smiles 4 Miles
reached more than**

51,000

**children and their families across
750 early childhood services**

Smile Squad – School Dental Program

Smile Squad continued to roll out to public schools across Victoria, despite pauses to services due to COVID-19 restrictions. Smile Squad is the government's free school dental program, which offers all Victorian public primary and secondary schools free, high-quality dental care at school, saving families time and money. Services were only provided where and when it was safe to do so and in keeping with COVID-19 restrictions. During this time services were provided to more than 1,000 students. There were 161 new public primary and secondary schools invited to take part in Smile Squad from Term 2 of 2021 (Dental Health Services Victoria, 2021).

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