This is the fifth publication in a series of biennial reports that provide a comprehensive picture of the health and wellbeing of Victorians. It has been developed to meet the requirements of s. 21(c) of the Public Health and Wellbeing Act 2008 and covers the period to June 2014.

The health of Victorians is generally good, reflected in high levels of self-reported health and psychological wellbeing. Life expectancy is increasing, and good health is promoted by a reduction in risk factors such as smoking and access to key preventive interventions such as immunisation and screening programs.

However, this report highlights room for improvement. Health and wellbeing gaps continue to exist in specific areas and population groups. In particular, the health of Aboriginal and Torres Strait Islander Victorians continues to be poorer than that of non-Aboriginal Victorians. In addition, there have been increases in some health conditions including cancer, diabetes and some infectious diseases such as syphilis and salmonella.

**Nutrition**

Food and nutrition are fundamental to the health of all Victorians. For the first time, in this publication series, we have information on the extent of consumption of discretionary foods and drinks. Some of the information is of concern, particularly that about one-third of Victorians’ energy (kilojoule) intake comes from ‘discretionary’ food and drinks – energy-dense items of little nutritional value. The greatest dietary challenge facing many Victorians is the excessive availability, promotion and intake of discretionary foods that have little or no nutritional value. Two-thirds of Victorian adults consume too many kilojoules, and Victorian children are getting about 40% of their energy intake from discretionary foods.

These consumption patterns are fuelling our epidemic of obesity and chronic disease. The current societal environment is one that offers disproportionate access, affordability and promotion of discretionary foods that are the major contributors to poor diets. In everyday settings where the population works, commutes, learns and lives, less healthy choices dominate.

**Syphilis**

Syphilis, which was common in Europe in the 18th and 19th century, has been on the increase in the last few years in Victoria. New cases reported are predominantly in men who have sex with men (MSM). Not only is the rise in syphilis cases an issue of itself, but syphilis infection also increases both susceptibility to acquiring HIV infection and transmissibility of HIV infection.

Screening of groups at risk is essential for syphilis control, along with partner notification and prevention education. In Victoria, a reviewed and refocussed prevention campaign has been targeted at affected groups.
It is hoped that the information contained within this report will help inform policy and planning about emerging issues and areas of need in Victoria. This can also contribute to existing initiatives, and support the partnerships in government that are needed to deal with these challenges.

It is a privilege for me to finalize and present this document, the content of which was completed under the expert guidance of Professor Michael Ackland prior to his retirement from the role of Acting Chief Health Officer.

I would like to take this opportunity to thank the Health Intelligence Unit, System Intelligence and Analytics, the Health Protection Branch and the Prevention, Population, Primary and Community Health Branch of the Department of Health and Human Services, together with other government and non-government agencies that have contributed time, expertise and data for this report.

Dr Roscoe Taylor
Acting Chief Health Officer
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Executive summary

This report has been prepared to meet the requirements of s. 21(c) of the Public Health and Wellbeing Act 2008. It is the fifth report in the Victoria’s health (formerly Your health) series and covers the two-year period to June 2014. It has been structured using the National health performance framework 2009 and provides an overview of the health of Victorians, in particular their health status and the factors that determine their health.

This section presents selected findings from the report. For more information on a particular topic, please refer to the relevant chapter of the report.

A focus on the health and wellbeing of Victorians: nutrition

- Poor diet is the largest cause of early death and ill health – more than smoking – and is estimated to cause 9,000 deaths a year.
- Two-thirds of Victorian adults consume too many kilojoules.
- Discretionary food and drinks make up about one-third of adult’s and 40 per cent of children’s daily energy intake.
- Nutrition indicators such as fruit consumption and food insecurity are poorer for Aboriginal compared with non-Aboriginal Victorians.

Health status

- The majority of adult Victorians rate their health favourably (81.8 per cent rate their health as good/very good/excellent) and feel valued by society, with almost two-thirds (64.4 per cent) reporting low levels of psychological distress.
- Aboriginal Victorians are less likely to rate their health as excellent or good and are significantly more likely to have experienced high or very high psychological distress levels compared with their non-Aboriginal counterparts.
- There has been a general increase in the incidence of cancer over the past two decades, as a result of population ageing. At least one in three Victorians will develop cancer by the age of 75, with the risk higher in males compared with females. The most common cancers are prostate, breast, bowel, lung and melanoma.
- Despite the increase in cancer incidence, mortality rates from cancer have declined since 1982, reflecting earlier detection of cancers through screening, falling tobacco use and improved treatments.
- More than one in five (22.3 per cent) Victorians aged 65 years or older have been told by a doctor that they have heart disease. The prevalence of heart disease is about twice as high in men with the lowest annual household income compared with those with the highest household income.
- Five per cent of the adult Victorian population have been diagnosed with type 2 diabetes mellitus. The prevalence of type 2 diabetes has increased by about 50 per cent in Victoria between 2003 and 2011–12.
- The majority of Victorian adults rate their oral health as excellent, very good or good, however approximately a quarter rate their oral health as fair or poor, or report having no natural teeth. Factors associated with poor oral health include gender, age, socioeconomic status and geographic location.
- In 2012–13, 95,377 Victorians were admitted to hospital as a result of injury and poisoning, with falls accounting for 47 per cent of all overnight admissions.
• In 2009 there were 3,078 babies born with birth defects, including those identified as terminations of pregnancy before 20 weeks’ gestation for a birth defect. The overall birth defect prevalence rate was 4.2 per cent.

• Babies born to Aboriginal mothers in 2011 were nearly twice as likely as babies born to non-Aboriginal mothers to have low birthweight (< 2,500 grams) (11.1 per cent and 6.6 per cent respectively) or very low birthweight (< 1,500 grams) (2.0 per cent and 1.3 per cent respectively), although there has been some improvement in this indicator since 2008.

• In 2011–12, 2.4 per cent of adult Victorians reported ever having a stroke. Among older adults aged 65 or older, the prevalence was higher among men compared with women. Prevalence was also lower among those with higher household incomes.

• The number of fall-related hip fractures has increased over the past 15 years, with 3,487 admissions in Victoria in 2012–13. However, the rate of fractures has decreased over this same period to 851.3 per 100,000 population in 2012–13 compared with 1,117.6 per 100,000 population in 1998–99.

• Male and female life expectancy at birth continues to progressively increase for Victorians over time, from 78.1 years in 1979 to 84.7 years in 2011–13 for women and from 71.0 years in 1979 to 80.7 years in 2011–13 for men.

• The difference in life expectancy at birth between men and women in Victoria has progressively decreased from 7.2 years in 1979 to 4.0 years in 2011–13.

• The Victorian perinatal mortality rate has remained relatively steady in recent years, at about 10 deaths per 1,000 live births.

• In 2012, 502 people died in Victoria due to intentional self-harm injury (suicide), a death rate of 8.9 per 100,000 people.

• Overall, five-year survival for Victorians with cancer has increased from 47 per cent in the period 1986–1990 to 67 per cent in the period 2008–2012. The cancers with the highest five-year survival rates are testis, thyroid, prostate, melanoma, breast and Hodgkin lymphoma.

Determinants of health

• Lifestyle behaviours such as smoking, poor diet, alcohol misuse and low levels of physical activity contribute significantly to the burden of disease in Victoria, yet they are largely modifiable, providing considerable scope for health gain over the long term. Survey data show favourable trends for many of these behaviours.

• More than half of all adult Victorians (65.9 per cent of men and 61.7 per cent of women) performed a minimum of 30 minutes of moderate-intensity physical activity on at least five days each week in 2011–12.

• Survey data show that 5.5 per cent of adult Victorians were sedentary (did no physical activity) in 2011–12.

• Tobacco use is associated with substantial disease burden in Victoria, and smoking rates have decreased significantly for both men and women over time. In 2011–12 less than one in five (18.6 per cent) of men and 12.9 per cent of women aged over 18 years were current smokers. However, smoking is more common amongst people on lower household incomes, and in 2008 a significantly higher proportion of Aboriginal Victorians smoked compared with non-Aboriginal Victorians.
Survey data show that approximately 4.2 per cent of men and women aged 18 years or older reported consuming alcohol at levels that were ‘risky’ or ‘high risk’. The majority of Victorian men (81.0 per cent) and women (73.8 per cent) were at low risk of long-term harm from alcohol consumption in 2011–12. About one in seven men (12.7 per cent) and 5.6 per cent of women reported consuming alcohol at least weekly at levels that put them at short-term risk of alcohol-related harm.

Survey data from 2011–12 also show that in people aged 45 years or older, a higher proportion of men than women reported that they had had a blood cholesterol test in the previous two years (84.3 per cent and 80.6 per cent respectively). However, women (85.1 per cent) were more likely than men (79.5 per cent) to have their blood pressure checked.

The number of notified cases of syphilis has been increasing in Victoria over the past decade, with 629 notifications in 2014. The majority of cases are in men who have sex with men (MSM), and the increase can be attributed to changes in sexual practices, an increase in the rates of testing and targeted testing.

During the two-year period 2011–2012, 54.5 per cent of eligible Victorian women participated in the BreastScreen Victoria Program.

Overall, 36.1 per cent of eligible Victorians participated in Phase 2 (July 2008–June 2011) of the National Bowel Cancer Screening Program. Participation rates were highest in people aged over 65 years (40.9 per cent) and were higher in women (36.4 per cent) compared with men (31.5 per cent).

The estimated two-year (2012–2013) cervical cancer screening participation rate for women in the target population of 20–69 years was 60.4 per cent. Participation varied by age group, with women aged 50–59 years having the highest two-year screening rate and women aged 20–29 years having the lowest rate. In 2012, 78 per cent of cervical cancers were diagnosed in women who had either never had never been screened for cervical cancer or were lapsed screeners.

The proportion of children aged 60–63 months who received all scheduled vaccinations in Victoria was 92.6 per cent at 30 June 2014.

Survey results show that 32.7 per cent of Victorians aged 18 years or older were overweight and 17.5 per cent were obese in 2011–12. Data from the 2008 Victorian Population Health Survey showed no statistically significant differences between Aboriginal and non-Aboriginal Victorians in body weight status.

The uptake of newborn screening in Victoria is extremely high. In 2013–14, 77,732 newborns were tested and 96 were identified as having one of the conditions screened for as part of the Newborn Screening Program.

In 2014 there were an estimated 5.84 million people usually resident in Victoria. Just under half (49.5 per cent) were men and 50.5 per cent were women.

Survey results show that, in 2011-12, over a quarter of homes in Victoria were rented, about one in 10 (10.5 per cent) households had a gross annual income less than or equal to $20,000 and 5.3 per cent of the labour force was unemployed.

In 2011–12, more than eight in 10 people reported that they could definitely get help from family or friends if needed and more than one-fifth reported that they had volunteered their time in a local community group.
• Melbourne typically meets the national goal for air quality, measured in terms of airborne particles as PM$_{10}$, but may be affected by drought-related impacts such as particles from dust storms and smoke from bushfires. For 2010, 2011 and 2012, the goal of no more than five days a year above the national 24-hour objective value (average PM$_{10}$ below 50 µg/m$^3$) was met.

• All Victorian weather monitoring stations operating in 2012 and 2013 met the goals for the one-hour ozone objective; however, in 2013 the four-hour ozone objective was met on all but one day.

• The quality of reticulated drinking water supplies in Victoria is generally very good. In 2013–14, almost all (99.9 per cent) of the reticulated drinking water samples complied with the E. coli water quality standard. This means that almost all of the drinking water localities were supplied with compliant drinking water.

• In the period 2003–2013 the number of detections of Legionella in cooling tower water samples was consistently low. There was a steady decrease in the number of cooling towers operating in Victoria over this time.

• The number of notified cases and the notification rate of salmonellosis have increased in Victoria over the past 13 years. Outbreaks of salmonellosis have also increased in the past five years. Eggs, predominantly ready-to-eat foods containing raw eggs, have been identified as the source for many of the outbreaks.
Keeping Victorians as well as they can be is important for individuals, families and the community. It is also crucial for a healthy, productive workforce and a strong economy.

This report, *Victoria’s health*, is the fifth report in what was formerly the *Your health* series, covering the two-year period to June 2014. It has been prepared to meet the requirements of s. 21(c) of the *Public Health and Wellbeing Act 2008*. The report provides an overview of the health and wellbeing of Victorians, as well as the determinants of health in Victoria. It is structured to reflect the *National health performance framework*, which incorporates indicators across a wide range of health dimensions (*AIHW 2012a*). The data contained within this report are collated from a variety of sources, and therefore reporting periods differ for the various indicators.

The information in this report is a valuable overview of the health issues that Victoria faces. It can provide an important starting point in considering policy and government investments for improving the health of the Victorian population. Indicators have been selected based on those that have readily available data that have been measured over time. The report provides a strong basis for a concerted public health effort to reduce health inequalities and further improve the health status of Victorians by tackling the enormous burden of, and the steady increase in, preventable diseases.

For the first time, this report includes a chapter focusing on a specific aspect of the health and wellbeing of Victorians, including policy initiatives to improve this. The chapter, which this year concentrates on nutrition and health, has been developed in conjunction with the nutrition team in the department’s Population Health and Prevention Strategy Branch.

**National health performance framework**

The *National health performance framework* was originally developed by the National Health Performance Committee (NHPC) as a structure to guide the understanding and evaluation of the health system (*NHPC 2001*). The framework was reviewed by the NHPC in 2007–08, and the revised framework was agreed by the National Health Information Standards and Statistics Committee (NHISSC) and noted by health ministers in September 2009.

The 2009 framework encompasses the domains of ‘health status’ and ‘determinants of health’, as well as a third domain of ‘health system interventions’ that influence health status and determinants of health, both for individuals and at the population level (*AIHW 2012b*). This report focuses on the domains of health status and determinants of health only and uses this abbreviated framework as the basis for its structure. It was selected as an appropriate structure because it provides a comprehensive overview of health for reporting purposes.¹

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¹ Recent health reform has resulted in a strengthening of activity to assess the performance of Australian health systems. The National Health Performance Authority was established in 2011 as part of the Council of Australian Governments (COAG) *National Health Reform Agreement*, together with the Performance and accountability framework (PAF), to measure health system performance. The PAF facilitates reporting across three domains relating to the equity, effectiveness and efficiency of service delivery in healthcare. The PAF focuses on measuring health system performance at the local and organisational levels, and across hospitals and primary healthcare services. This differs from the 2009 *National health performance framework*, which has been ultimately designed to measure the health status of the population (*NHPA 2012*).
Health status

This domain consists of four dimensions that cover a range of indicators summarising the impact of disease and injury on the wellbeing of Victorians (see Figure 1). The indicators provide an overall measure of population health, which may be either wholly or partially attributable to health service intervention:

- **health conditions** – measured through the prevalence of disease, disorder, injury or trauma or other health-related state
- **human function** – measures alterations to body structure or function (impairment), activity limitations and restrictions in participation
- **wellbeing** – includes measures of physical, mental and social wellbeing
- **deaths** – includes mortality rates and life expectancy measures.

Determinants of health

The determinants of health make an impact at the individual and/or population level. They are key to the prevention of disease and injury and help explain and predict trends and inequalities in health status. They can be behavioural, biomedical, socioeconomic or environmental. Determinants of health can have an effect late in the causal pathway (such as tobacco smoking) or further upstream via a number of intermediaries (such as socioeconomic status and environmental factors). This domain organises indicators under four dimensions (Figure 1):

- **environmental factors** – includes physical, chemical and biological factors such as air, water, food and soil quality
- **community and socioeconomic** – measures community factors such as social capital, support services and socioeconomic factors such as housing, education, employment and income
- **health behaviours** – includes attitudes, beliefs, knowledge and behaviours such as patterns of eating, physical activity, smoking and alcohol consumption
- **biomedical factors** – incorporates genetic-related susceptibility to disease and other factors such as blood pressure, cholesterol levels and body weight.
Data considerations

The data presented have been obtained from a variety of sources including published sources and administrative databases. Each data source has been cited in the report, and the technical notes in the appendices describe the statistical methods used in analysis and interpretation. The technical notes also indicate where indicators have been improved from previous reports.

Some indicators include data on the health and wellbeing of Aboriginal Victorians. These are largely sourced from the department’s report The health and wellbeing of Aboriginal Victorians: Victorian Population Health Survey 2008 supplementary report. In accordance with this report, the term ‘Aboriginal’ is taken to include both Aboriginal and Torres Strait Islander people.
In all cases, the data cited is the most recent available at the time of data extraction for indicator development (up to June 2014). Where the required data for the reporting period are not yet available, not considered reliable or were not collected, the most recent and reliable information available has been presented. In some instances, the information provided is for a calendar year (for example, 2012) or for a financial year (for example, 2012–13) or for a specific period (for example, 2010–11 to 2011–12, which covers two financial years, or 2010–2011, which covers a two-year period). In many cases, the information provided falls outside the reporting period and this is clearly noted in each instance.

Most of the information provided is specific to the Victorian resident population; however, there are some sections that include information relevant to other jurisdictions. Once again, this is noted in each instance.

**Improving health and wellbeing in Victoria**

Preventing illness and improving health and wellbeing is a major challenge requiring specific action and a collective effort. Achieving sustained reductions in the growth of preventable chronic diseases and creating lasting improvements in the health and wellbeing of people and communities, requires coordinated, responsive and sustainable action at individual, community and societal levels led by many players. The Victorian *Public Health and Wellbeing Act (2008)* recognises that the state has a significant role in promoting and protecting the public health and wellbeing of Victorians.

The department’s corporate plan aims to support Victorians to live healthier lives.

An integrated approach to lifetime health and wellbeing is critical to producing and promoting the best mental and physical health outcomes for the Victorian population. The department will drive this by providing leadership and advocacy for health across government, as well as through core health service delivery. This encompasses a collaborative approach to the department’s role in the health system and considers the influence of social, economic and physical environments over health and wellbeing in the community. This will be achieved through:

- ensuring the department’s framework for investment and accountability takes account of the social determinants of health
- building a common approach to health promotion, prevention and protection for all Victorians, in particular at-risk groups, through a transparent set of priorities and agreed support strategies
- engaging individuals, communities and the health system to protect and improve health and wellbeing, particularly for those experiencing disadvantage
- encouraging and supporting health services to provide care in ways that maximise long-term health outcomes, for instance focusing on early intervention and preventing readmissions
- delivering programs and regulations to protect the health of all Victorians from communicable disease, unsafe food and hazards in the environment
- supporting the delivery of programs that improve health and wellbeing across the life course
- leading collaborative initiatives with other departments that have impacts on health outcomes.
The Victorian Public Health and Wellbeing Act (2008)

The Victorian Public Health and Wellbeing Act (2008) (the Act) also has significant implications for the development of public health policy through requiring a state public health and wellbeing plan to be developed every four years, and, importantly, localised municipal public health and wellbeing plans. The Act requires both the state and municipal public health and wellbeing plans to demonstrate how each level of government will work with each other and with other organisations to accomplish the goals of the state plan.

Victorian public health and wellbeing plan

Although this report covers the period 2012-2014, it should be noted that the second Victorian public health and wellbeing plan 2015–2019 was delivered on 1 September 2015 (Department of Health 2015). The Plan establishes a new and ambitious vision for the state:

a Victoria free of the avoidable burden of disease and injury, so that all Victorians can enjoy the highest attainable standards of health, wellbeing and participation at every age.

Consistent with this vision, and with the objective of the Act, the overarching aim of the plan is to reduce inequalities in health and wellbeing.

The Plan identifies a number of key strategic directions and priorities and recognises the need for improvements in health and wellbeing at all stages of life. The priorities identified are:

- Healthier eating and active living
- Tobacco-free living
- Reducing harmful alcohol and drug use
- Improving mental health
- Preventing violence and injury
- Improving sexual and reproductive health.

The Plan acknowledges the importance of sustainable environments for health and wellbeing, and identifies place-based and people-centred approaches as important platforms for change.

The plan takes a systems perspective which recognises that many public health problems have complex and multiple causes, requiring coordinated and ‘joined-up’ action, beyond disciplinary, programmatic or sectoral silos. This is particularly important in cases of entrenched social disadvantage.

Victoria’s implementation of a systems approach to prevention and health promotion provides a foundation for the ongoing improvement of the health and wellbeing of Victorians most in need. Initially this has involved investment in a place-based, whole-of-community approach across 14 local government areas. These local efforts have been matched with statewide policy and leadership for change initiatives to ensure both top-down and bottom-up approaches are delivered to yield strongest population health outcomes. This internationally recognised approach has empowered local governments, health services, non-government agencies and business, industry and communities to collectively deliver action for better health and lead change in the places where Victorians live, learn, work and play.

Protecting health

Protecting the health of Victorians is achieved through reducing the incidence of disease resulting from, or associated with, communicable disease, food, water or the environment. These activities include:

- daily surveillance of notifications of communicable disease
- monitoring, detecting and investigating particular notifiable diseases
- managing associated outbreaks
- assessing and managing the health effects of environmental hazards.

Immunisation, food safety and emergency response are also important activities in this area.

Koolin Balit action plan

*Koolin Balit* outlines the Victorian Government’s strategic directions for Aboriginal health over a 10-year period from 2012 to 2022 (Department of Health 2012). It was launched by the Minister for Health at the Aboriginal health conference in May 2012 and sets out what the department, together with Aboriginal communities, other parts of government and service providers will do to achieve the government’s commitment to improve Aboriginal health.

The objectives of the government are to:

- close the gap in life expectancy for Aboriginal people living in Victoria
- reduce the differences in infant mortality rates, morbidity and low birth weights between the general population and Aboriginal people
- improve access to services and outcomes for Aboriginal people.

*Koolin Balit* focuses on six key priorities. These are:

1. a healthy start to life
2. a healthy childhood
3. a healthy transition to adulthood
4. caring for older people
5. addressing risk factors
6. managing illness better with effective health services.

In order to achieve the above priorities, the Victorian government has committed to achieving best practice that is evidence based, supports strong and vibrant Aboriginal communities, and ensures Aboriginal health is everyone’s business.
References


Australian Institute of Health and Welfare (AIHW) 2012b, Australia’s health 2012, Australia’s Health Series no. 13, cat. no. AUS 156, AIHW, Canberra.


A focus on the health and wellbeing of Victorians: Food and nutrition
A focus on the health and wellbeing of Victorians: Food and nutrition

Food is a fundamental part of our everyday lives. A nutritious diet and adequate food supply are central for promoting health and wellbeing. A shortage of food and lack of variety can cause malnutrition and deficiency diseases. Excess intake contributes to the risk of obesity, cardiovascular diseases, diabetes, some cancers and dental caries. Increased consumption of fruit and vegetables helps reduce the risk of overweight and obesity, heart disease and certain cancers. In 2010 dietary factors were the leading cause of disease burden in Australia, followed by high body mass and smoking (IHME 2013).

Healthy eating is essential for normal growth and physical and cognitive development in infants, children and young people. It is integral to supporting a robust workforce and thriving economy. Because healthy eating at each life stage affects subsequent stages in a cumulative way, healthy eating is fundamental for healthy ageing.

This chapter provides, for the first time, information for Victoria on consumption of discretionary foods and drinks, and on the proportion of adults meeting nutrient guidelines. Discretionary foods are principally sugary drinks, takeaway foods, biscuits, cakes, snack foods, chocolates (and other confectionary) and alcohol. According to national guidelines, such foods can be included in diets in small amounts by those who are physically active, but are not a necessary part of the diet (NHMRC 2013).

What is the prevalence?

Energy and nutrients

For Victorian adults aged 18–75 years in 2009–10 (Department of Health 2012) (Figure 2):

Energy: Mean daily energy intake was 9,860 kJ, with 8,700 kJ the generally accepted amount for an Australian adult intake used in development of national food standards (ANZFA 2014). About two-thirds (62 per cent) of adults exceeded the accepted kilojoule intake.

Sodium: Mean daily intake of sodium was 3,182 mg, or about 1.5 teaspoons of salt, with 99 per cent exceeding the maximum adequate intake level and 74 per cent exceeding the recommended upper level of intake. More than one-third of sodium (37 per cent) was derived from discretionary foods. For children aged 2–18 years, the mean daily sodium intake in 2011–12 was 2,450 mg (ABS 2015a).

Sugar: Mean daily total sugar intake was 117 g. This includes sugar from added and natural sources. Nearly half the sugar (42 per cent) was derived from discretionary foods. For children aged 2–18 years, the mean daily total sugar intake in 2011–12 was 111 g (ABS 2015a).

Calcium: Mean daily calcium intake was 905 mg, with 51 per cent not meeting the estimated average requirement. For children aged 2–18 years, the mean daily calcium intake in 2011–12 was 789 mg (ABS 2015a), indicating that many older children do not consume enough calcium.

Fat: Mean daily total fat intake was 84 g, with 33 per cent exceeding acceptable levels.

Fibre: Mean daily fibre intake was 26 g, with 57 per cent not meeting adequate intake guidelines.

Two-thirds of adults consume too many kilojoules (calories) – too much food and drink.

Poor diet is the largest cause of early death and ill-health – more than smoking.
maximum proportion of total energy intake. For saturated and trans fat, the combined mean daily intake was 33 g, with 75 per cent exceeding acceptable daily maximum intake.

Foods

For Victorians in 2011–12 (ABS 2015b) (Figure 2):

**Discretionary food and drink:** At least 35 per cent of energy came from discretionary foods and drinks – that is, those high in energy with little nutritional value. For adults, 35 per cent of energy came from discretionary food and drinks, and 39 percent for children. Guidelines recommend zero or, at most, 10 per cent of energy from these sources (NHMRC 2013).

**Fruit:** 53 per cent of adults did not consume the recommended fruit serves daily (mean 1.5 serves), nor did 25 per cent of children (mean 2.0 serves).

**Vegetables:** 93 per cent of adults did not consume the recommended vegetable serves daily (mean 2.4 serves), nor did 88 per cent of children (mean 2.0 serves).

**Soft drink:** 23 per cent of adults drank soft drink daily, 16 per cent for sugar-sweetened soft drinks (non-diet drinks) (Department of Health 2014), and 39 per cent of children aged 2–18 years drank soft drink, with most (35 per cent) being sugar-sweetened (non-diet), in the 24 hours preceding the survey (ABS 2015b).

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**Figure 2: A snapshot of selected nutrition indicators, Victoria**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Adults</th>
<th>Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy from discretionary foods</td>
<td>35*</td>
<td>39*</td>
</tr>
<tr>
<td>Too little calcium</td>
<td>51**</td>
<td>39*</td>
</tr>
<tr>
<td>Too little fibre</td>
<td>57**</td>
<td>74**</td>
</tr>
<tr>
<td>Too little vegetable</td>
<td>93*</td>
<td>88*</td>
</tr>
<tr>
<td>Too little fruit</td>
<td>53*</td>
<td>25*</td>
</tr>
<tr>
<td>Too much saturated fat</td>
<td>75**</td>
<td></td>
</tr>
<tr>
<td>Too much sodium</td>
<td>74**</td>
<td></td>
</tr>
<tr>
<td>Too much energy</td>
<td>62**</td>
<td></td>
</tr>
</tbody>
</table>

Sources: *Australian Health Survey 2011–12, **Victorian Health Monitor 2009–10
Breastfeeding: In 2010, 72 per cent of infants were not exclusively breastfed to four months of age and 98 per cent were not to six months (AIHW 2011). National guidelines recommend exclusive breastfeeding to around six months (NHMRC 2012).

Is it the same for everyone?

In general, women have healthier food consumption patterns than men, with similar patterns for all children. Older adults generally have healthier consumption than younger adults, and younger children healthier consumption than older children. Adults of higher income consume more energy and more sodium than those of lower income. Conversely, those of lower income consume less calcium and fruit and more soft drink than those of higher income. There is little difference in intake of these nutrition components between rural and metropolitan adults.

Little is known about the nutritional status of many subpopulations within Victoria, including people of culturally and linguistically diverse backgrounds. Information for Victorian Aboriginal and Torres Strait Islander people (‘Aboriginal Victorians’) is reported when available; otherwise, information for Australian Aboriginal and Torres Strait Islander people (‘Aboriginal Australians’) is reported.

Energy and nutrients

Energy: Men were twice as likely as women to exceed the generally acceptable daily energy (kJ) intake (Table 1) (Department of Health 2012). Younger people and those with higher incomes were more likely to exceed the intake. Adults aged 18–44 years were about 40 per cent more likely to exceed the energy intake than those aged 65–75 years. Adults with annual household income greater than $100,000 were 24 per cent more likely to exceed the acceptable intake than adults with income less than $40,000.

<table>
<thead>
<tr>
<th>Adults</th>
<th>Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 in 10 ate enough vegetables</td>
<td>1 in 10 ate enough vegetables</td>
</tr>
<tr>
<td>5 in 10 ate enough fruit</td>
<td>8 in 10 ate enough fruit</td>
</tr>
</tbody>
</table>

Sodium: Men were 40 per cent more likely than women to exceed the upper level of intake. Adults aged 18–24 years were 31 per cent more likely to exceed the recommended upper level than adults aged 65–75 years. Proportions of sodium derived from discretionary foods were similar for sex and age groups.

Sugar: Men consumed more total sugars than women, with an average 128 g consumed by men and 107 g by women. Adults aged 18–44 years consumed 10 per cent more sugar daily than those aged 65–75 years. Rural adults consumed about 10 per cent more sugar daily than metropolitan adults. Proportions of total sugar derived from discretionary foods were higher for adults aged 18–44 years. Detailed analysis on the food sources of sugar will be reported in 2016.

Calcium: Women were about 50 per cent more likely than men to not meet the recommended calcium intake. Older people and those with lower income were more likely to not meet the recommendation. Adults aged 65–75 years were about 75 per cent more likely to not meet the recommended intake than adults 18–44 years. Adults with annual household income less than $40,000 were 43 per cent less likely to meet the recommendation than adults with income greater than $100,000.

Half of adults don’t get enough fibre and calcium.
Fat and fibre: Prevalence of excess saturated and trans fat, and of inadequate intake of fibre were similar across population groups.

Foods

Discretionary food and drink: For all Victorians, discretionary foods and drinks contributed about three times the recommended 10 per cent maximum contribution to daily energy intake for active people of healthy weight (NHMRC 2013). The proportion of energy intake from discretionary food was about one-third for men and women, and across all age groups (Table 2, Figure 3) (ABS 2015b). The highest proportion (41 per cent) was for teenagers aged 14–18 years.

Table 1: Prevalence of selected nutrition indicators (95% CI), Victoria, 2009–10

<table>
<thead>
<tr>
<th></th>
<th>Excess energy intake %</th>
<th>Inadequate calcium intake %</th>
<th>Inadequate fibre intake %</th>
<th>Excess saturated fat intake %**</th>
<th>Excess sodium intake*** %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Persons</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–75 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Males</td>
<td>80.0 (76.4–83.1)</td>
<td>40.7 (37.2–44.3)</td>
<td>56.9 (53.5–60.2)</td>
<td>77.4 (74.8–79.8)</td>
<td>86.2 (83.9–88.2)</td>
</tr>
<tr>
<td>Females</td>
<td>43.1 (39.3–46.9)</td>
<td>61.0 (56.6–65.2)</td>
<td>57.3 (53.2–61.4)</td>
<td>73.0 (70.1–75.8)</td>
<td>61.5 (59.0–63.9)</td>
</tr>
<tr>
<td><strong>Persons</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–34 years</td>
<td>68.3 (61.9–74.1)</td>
<td>41.8 (35.3–48.6)</td>
<td>59.1 (53.4–64.6)</td>
<td>76.5 (72.3–80.2)</td>
<td>80.5 (75.5–84.7)</td>
</tr>
<tr>
<td>35–44 years</td>
<td>66.0 (60.8–70.9)</td>
<td>41.0 (36.4–45.8)</td>
<td>56.9 (51.3–62.4)</td>
<td>76.6 (72.6–80.2)</td>
<td>77.1 (72.8–80.8)</td>
</tr>
<tr>
<td>45–54 years</td>
<td>59.4 (54.3–64.3)</td>
<td>53.0 (48.3–57.7)</td>
<td>58.6 (52.7–64.3)</td>
<td>78.3 (74.8–81.5)</td>
<td>69.5 (76.5–73.3)</td>
</tr>
<tr>
<td>55–64 years</td>
<td>52.6 (48.5–56.7)</td>
<td>65.8 (62.2–69.3)</td>
<td>51.6 (47.4–55.9)</td>
<td>69.0 (65.2–72.5)</td>
<td>68.6 (64.3–72.6)</td>
</tr>
<tr>
<td>65–75 years</td>
<td>48.0 (41.5–54.6)</td>
<td>72.4 (68.0–76.3)</td>
<td>56.4 (49.5–63.0)</td>
<td>70.4 (65.9–74.5)</td>
<td>61.3 (55.4–66.9)</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metropolitan</td>
<td>62.7 (59.2–66.1)</td>
<td>49.8 (45.7–54.0)</td>
<td>55.5 (51.3–59.6)</td>
<td>72.2 (69.6–74.7)</td>
<td>73.9 (71.5–76.2)</td>
</tr>
<tr>
<td>Rural</td>
<td>59.4 (55.7–63.0)</td>
<td>52.8 (49.8–55.7)</td>
<td>59.5 (55.8–63.1)</td>
<td>79.6 (77.7–81.3)</td>
<td>73.2 (70.9–75.4)</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; $40,000</td>
<td>54.6 (46.9–59.2)</td>
<td>62.0 (56.3–67.4)</td>
<td>56.0 (51.1–60.8)</td>
<td>73.8 (68.8–78.2)</td>
<td>68.6 (64.2–72.7)</td>
</tr>
<tr>
<td>$40–100,000</td>
<td>61.9 (57.1–66.5)</td>
<td>49.4 (44.1–54.7)</td>
<td>57.6 (53.7–61.4)</td>
<td>75.5 (72.6–78.2)</td>
<td>75.0 (71.5–78.2)</td>
</tr>
<tr>
<td>&gt; $100,000</td>
<td>67.9 (62.9–72.6)</td>
<td>43.3 (37.9–48.9)</td>
<td>57.4 (51.9–62.7)</td>
<td>76.0 (72.4–79.2)</td>
<td>77.0 (73.0–80.6)</td>
</tr>
</tbody>
</table>

* Annual household income  ** includes trans fat  *** Upper level of intake
Source: Victorian Health Monitor 2009–10

35 per cent of our energy comes from discretionary food and drinks.
Table 2: Prevalence of selected nutrition indicators (95 per cent confidence interval), Victoria, 2011–12

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Persons</th>
<th>Insufficient fruit intake %</th>
<th>Insufficient vegetable intake %</th>
<th>Vegetables – mean daily serves</th>
<th>Energy from discretionary foods %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2+ years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>51.3 (49.4–53.2)</td>
<td>1.5 (1.4–1.6)</td>
<td>93.9 (92.9–94.9)</td>
<td>2.2 (2.1–2.3)</td>
<td>36.7 (36.0–37.4)</td>
</tr>
<tr>
<td>Females</td>
<td>42.7 (40.5–44.9)</td>
<td>1.8 (1.7–1.9)</td>
<td>90.3 (88.9–91.7)</td>
<td>2.4 (2.3–2.5)</td>
<td>33.8 (33.1–34.5)</td>
</tr>
<tr>
<td>2–18 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>28.0 (23.7–32.3)</td>
<td>1.9 (1.8–2.0)</td>
<td>87.1 (84.5–89.7)</td>
<td>1.9 (1.8–2.0)</td>
<td>38.6 (37.2–40.0)</td>
</tr>
<tr>
<td>Females</td>
<td>22.4 (18.3–26.5)</td>
<td>2.1 (2.0–2.2)</td>
<td>89.0 (86.4–91.6)</td>
<td>2.0 (1.9–2.1)</td>
<td>38.4 (36.9–39.9)</td>
</tr>
<tr>
<td>19+ years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>53.0 (51.3–54.7)</td>
<td>1.5 (1.5–1.5)</td>
<td>93.0 (92.0–94.0)</td>
<td>2.4 (2.3–2.5)</td>
<td>34.6 (34.0–35.2)</td>
</tr>
<tr>
<td>Females</td>
<td>58.3 (56.1–60.5)</td>
<td>1.4 (1.3–1.5)</td>
<td>96.0 (95.1–96.9)</td>
<td>2.3 (2.2–2.4)</td>
<td>36.2 (35.4–37.6)</td>
</tr>
</tbody>
</table>

* Estimate has a relative standard error of 25% to 50% and should be used with caution  n/a Estimate not available for publication

Source: Australian Health Survey 2011–12
Cereal-based products (including biscuits, cakes, muffins, takeaway foods – pizza and hamburgers, and commercial pasta dishes) made the greatest contribution to discretionary food intake for the total population, at 10 per cent of total energy. This was about one-third of all energy from discretionary foods. The proportion was similar across all age groups, from children aged 2–3 years to adults aged 71 years and older. Confectionary, cereal/nut/fruit/seeds bars (snack bars), non-alcoholic beverages (for example, soft drinks and fruit juices) and savoury snack foods contribute about 12 per cent of total energy intake of children. For adults, these foods contributed about 7 per cent of total energy – similar to that of alcohol at 6 per cent (Figure 4).
All Victorian adults consumed discretionary foods on a daily basis in 2009–10 (Department of Health 2012). The types of discretionary foods and frequency of consumption varied markedly between Victorian adults and children in 20011–12 (ABS 2015b). Confectionary and snack bars were consumed by four in 10 children and three in 10 adults in the 24 hours preceding the survey (Figure 4). Children and teenagers most commonly ate snack foods such as potato chips, corn
chips and flavoured popcorn, with about three in 10 children 2–13 years doing so in the previous 24 hours. One in three adults consumed alcohol in the previous 24 hours.

For Aboriginal Australians aged two years and older in 2012–13, 41 per cent of total energy came from discretionary foods and drinks (Figure 3) (ABS 2015c). This was similar to that of non-Aboriginal Australians. The proportion was lowest at one-third (32 per cent) of total energy for children aged two to three years, and 41–43 per cent for those aged four to 50 years. Consumption rates of confectionary and snack bars, and of snack foods such as potato crisps, corn chips and flavoured popcorn in the 24 hours preceding the survey were similar for Aboriginal Australian and non-Aboriginal Australian children. About one-third of children consumed these discretionary foods in the 24 hours preceding the survey.

**Fruit and vegetables:** Most (94 per cent) Victorians aged two years and older in 2011–12 did not consume the recommended serves of fruit and vegetables daily (ABS 2015b). Men consumed less fruit and vegetables than women, while girls and boys had similar consumption patterns. Adult men consumed 21 per cent lower mean daily serves of fruit and 9 per cent of vegetables, than women.

Consumption of fruit varied between age groups. Victorians aged 19–30 years had the lowest daily fruit consumption, with 61 per cent not meeting the guideline intake. Adults in this age group consumed 1.3 serves daily – 65 per cent less than the mean serves of those 71 years and older (Figure 5). Teenagers aged 14–18 years consumed 20 per cent fewer fruit serves than younger children. For vegetables, excluding very young children, the proportion not meeting the guidelines was similar across age groups. Adults aged 19–30 years consumed 20 per cent fewer vegetable serves than adults 51 years and older.

There was variation in fruit and vegetable consumption across the state and between income categories in 2011–12, based on the 2003 dietary guidelines (NHMRC 2003). Adults in the department’s North and West Metropolitan Region were more likely to consume insufficient vegetables than the state average, while those in Gippsland Region were more likely to consume sufficient vegetables (Department of Health 2014). For fruit, proportions meeting the guidelines were similar across regions of the state. The proportion of adults not meeting the fruit consumption guidelines was 26 per cent higher for people of annual household income less than $40,000, compared with those with more than $100,000 income. There was variation in fruit and vegetable consumption between local government areas.

Aboriginal Victorians consume less fruit than all Victorians. Of Aboriginal Victorians aged 15 years and older in 2012–13, 62 per cent did not consume the recommended fruit serves daily (ABS 2014a), 17 per cent higher than for all Victorian adults in 2011–12 (ABS 2015b). For vegetables, 95 per cent did not consume the recommended serves daily (ABS 2014a), similar to that of all adult Victorians in 2011–12 (ABS 2015b).
Soft drink: For adults, 23 per cent drank soft drink daily in 2011–12. In addition, 16 per cent drank soft drink several times a week and 16 per cent about once a week – a total of 54 per cent of adult Victorians drank soft drink weekly (Department of Health 2014). Considering sugar-sweetened or non-diet soft drinks, 16 per cent of adults drank them daily, 12 per cent several times a week and 12 per cent about once a week – a total of 40 per cent of adult Victorians drank sugar-sweetened soft drink at least weekly.

Consumption rates varied markedly across the state. Men were twice as likely as women to drink sugar-sweetened soft drinks daily, as were adults with an annual household income less than $40,000 compared to those with income greater than $100,000. Rates also varied by departmental region and local government area. Of the adults who drank sugar-sweetened soft drinks daily, on average men drank 642 mL and women 492 mL. Young men and women aged 18–24 years drank an average of 700 mL – about two cans per day (assuming 375 mL cans).

For Victorian children, 39 per cent consumed soft drink in the previous 24 hours (ABS 2015b). Diet drinks were about one-tenth of these soft drinks, with 4 per cent of children consuming diet drinks. Rates for all soft drinks were similar for boys and girls. Children aged 14–18 years were about 60 per cent more likely to drink sugary drinks as children aged 4–13 years (Figure 6).

Electrolyte, energy and fortified drinks were consumed in the previous 24 hours by 2 per cent of Victorians aged two years and older in 2011–12 (ABS 2015b). Young people were the principal consumers of these drinks, with about 3 per cent of 14–30 year olds consuming these drinks daily.
Two cans of soft drink a day is the average for young adults.

Figure 6: Daily soft drink for children and sugar-sweetened soft drink for adults (95% CI), Victoria, 2011–12

What are the impacts?

In 2010 dietary factors were the largest attributable risk factor for burden of disease in Australia, accounting for 10.5 per cent of the total, followed by excess weight or high body mass (8.4 per cent) and smoking (8.3 per cent) (IHME 2013).

Dietary risks are a global issue and were the largest cause of the total burden of disease in the developed world and second largest in the developing world in 2010 (IHME 2013). Dietary factors included in this analysis were diets low in fruit, nuts and seeds, vegetables, whole grains, fibre, seafood omega-3 fatty acids and poly-unsaturated fats as well as diets high in sodium and processed meat. General over-consumption of food in the form of excess energy is not included in diet-related burden of disease analysis. Rather, over-consumption leads to an increase in body mass, which is reported as a separate risk factor for burden of disease.

Poor diet causes hospitalisations and deaths. Of the total burden due to dietary factors in Australia in 2010, 85 per cent was associated with premature mortality (IHME 2013). It was estimated that there were about 36,000 deaths in Australia that were directly or indirectly due to dietary factors. With about 25 per cent of Australia’s population living in Victoria, we can assume that dietary factors were associated with about 9,000 deaths in 2010, which is about one in four of all deaths (ABS 2012a). For disability, dietary factors were the fourth largest cause of disability burden in Australia in 2010, after high body mass, drug use and smoking.
The cost of poor nutrition to the health sector, individuals, business and the community is not known. In Australia in 2008 it was assessed that inadequate fruit and vegetable consumption cost about $206 million in national healthcare costs (VicHealth 2009). An increase of two extra serves of fruit or vegetables per person per day would reduce this cost by an estimated $71 million each year for cardiovascular disease alone.

Assessing the impact of poor nutrition and food choices requires inclusion of the assessment of overweight and obesity, or high body mass. Weight gain is generally caused by an imbalance between energy intake and energy expenditure. While the factors driving this imbalance at a population level are complex, it is clear that poor nutrition is a key cause of overweight and obesity. Nearly two-thirds of Victorian adults (61 per cent) and one in four children (24 per cent) were measured as overweight or obese in 2011–12, a total of 1.4 million overweight Victorians and 900,000 obese (ABS 2013). Being overweight has become a normal condition, and Victoria is now becoming an obese society.

Obesity reduces life expectancy. International studies have shown that median survival of obese people was reduced by two to four years and eight to 10 years for the severely obese (Prospective Studies Collaboration 2009). High body mass was estimated to directly or indirectly cause 18,500 deaths in Australia in 2010 (IHME 2013), indicating that about 4,600 deaths in Victoria in 2010 were associated with high body mass. As discussed above, dietary factors were estimated to cause about 9,000 deaths in Victoria in 2010. For comparison, cancer was the cause of about 11,000 deaths in Victoria in 2010, and 326 deaths were due to transport accidents (ABS 2012a).

The burden associated with ill-health or disability due to high body mass doubled in Australia between 1990 and 2010 (IHME 2013). In 2011, 6.7 per cent of inpatient hospital admissions in Western Australian were attributed wholly or in part to excess body mass (Scalley et al. 2013). Similar findings were found for South Australia (Larg & Miller 2011), with no study to date for Victoria.

The cost of obesity is high. It has been estimated that the financial cost in Victoria in 2008 was $2.052 billion, a total of $8.283 billion nationally (Access Economics 2008). Of this, 44 per cent was due to productivity losses, 24 per cent to health system costs, 23 per cent to carer costs and the remaining were principally due to indirect costs. That is, the financial cost of overweight and obesity was four times higher outside the health system than within. Furthermore, obesity has more than just financial effects – the cost of lost wellbeing based on burden of disease was about six times that of the financial cost in 2008. In Victoria the total cost of obesity in 2008 was $14.410 billion, with $12.358 billion due to lost wellbeing.

What are the trends?

The proportion of adults who consumed sufficient fruit, vegetables or both did not change between 2003 and 2011–12 in Victoria, based on the 2003 dietary guidelines (Department of Health 2014; NHMRC 2003). Trends over time for other nutrition indicators cannot be reported due to insufficient data.

For Australians, the contribution of total energy intake from macronutrient groups such as protein, fats and carbohydrates changed little between 1995 and 2011–12 (ABS 1995; ABS 2013). It is widely acknowledged that these studies include substantial under-reporting, particularly by obese adults (ABS 2015a). However, food types and eating patterns have altered, with a wider range of energy-dense, nutrient-poor foods now heavily marketed and consumed.
How do we compare?

Inadequate fruit and vegetable consumption among Victorian adults in 2011–12 was similar to national prevalence, based on 2003 guidelines (ABS 2014b). For fruit, Victoria had higher prevalence of insufficient consumption than New South Wales and the Australian Capital Territory, which were the lowest of all states and territories. For vegetables, Victorian prevalence was similar to all other states and territories. The proportions of Aboriginal Victorians meeting the fruit and vegetable guidelines were similar to Aboriginal Australians (ABS 2014a).

In 2011–12 the average energy intake for adults aged 19 years and older in Victoria was similar to the national average for both men and women (ABS 2015c). The proportion of energy from discretionary foods for Victorians aged two years and older was similar to the national proportion. Victorian children aged 2–18 years were 10 per cent less likely to consume confectionary compared with all Australian children.

National comparisons are not available for other indicators in this chapter. International comparisons are not available for any indicators due to markedly different data collection methods.

What is the cause?

Food choices are influenced by individual values and circumstances such as education, skills and income, as well as broader economic, social and environmental factors including marketing/promotion, access, availability, quality and price.

Access to healthy food not just ‘any food’

Food security, or availability and access to sufficient quantity, quality and variety of nutritious food, is fundamental to good health. Compromised access to healthy food is associated with lower nutrient intakes, lower physical wellbeing, higher rates of obesity and chronic disease and poorer mental health status (Casey et al. 2006). It is also a key factor contributing to health inequalities. There is a broad range of factors that influence food access, including household income, transport options, food distribution, and the increasing costs of food. There are many reasons people may not always have the quality, variety or quantity of food they want. One in five Victorian adults in 2011–12 considered that some foods were too expensive for them, and one in four said they couldn’t get food of the right quality (Department of Health 2014). One in 10 adults couldn’t get a variety of food they wanted and one in 20 reported that culturally appropriate foods weren’t available and also that inadequate public transport made it difficult for them to get to the shops. These barriers to food purchasing were more commonly reported by younger adults, particularly women.

A healthy diet may be unaffordable for some Victorians. The average cost of a ‘healthy food basket’ for a family of four in 26 local government areas (2012–2015) represented about 31 per cent of household income for families on low incomes (Palermo et al. 2015).

Increase in convenience foods and food eaten outside of the home

National household expenditure on meals away from home has increased by 55 per cent in real terms since the 1980s, with households now spending about one-third of their weekly food budget on eating out (ABS 2006). Australians now spend 42 cents in every food dollar eating out of home (NSW Health 2010). One-fifth of Australians eats dinner out or has takeaway for dinner more than five times a week (Ipsos Australia 2013).
Unhealthy foods and drinks are everywhere, in large portion sizes, inexpensive and heavily marketed and promoted

The current societal environment is one that offers disproportionate access, affordability and promotion of ‘discretionary foods’ that are the major contributors to poor diets. In everyday settings where the population works, commutes, learns and lives, less healthy choices dominate. For example:

- The density of fast food outlets is four times that of green grocers/supermarkets in eight mapped Victorian local government areas and up to six times in some suburbs (Healthy Together Victoria 2015).
- Vending machines typically offer discretionary foods. For example, 91 per cent of the offerings available in vending machines located in hospitals, sport centres and workplaces, were discretionary foods and drinks.

Foods and drinks eaten outside the home are typically more energy-dense and of larger portions than meals prepared at home. Fast foods such as deep-fried chips, pizzas and soft drinks typically provide a third to half of daily energy, total fat, saturated fat and sugar intakes but less than a quarter of most micronutrients (Rangan et al. 2009). Over the past three decades portion sizes have increased two- to fivefold (Young & Nestle 2003). The ‘super-sizing’ of convenience foods means, for just 12 per cent more in price, one can consume 23 per cent more energy, 25 per cent more fat and 38 per cent more sugar (Cameron-Smith, Bilisborough & Crowe 2002). This has led to a societal change in consumption norms where these large portion sizes are now eaten often (Wansink & Van Ittersum 2007).

Australian children are exposed to high levels of advertising and promotion of unhealthy food and drinks. There is evidence that children’s exposure to unhealthy food marketing negatively influences their food choices and contributes to childhood overweight and obesity (WHO 2010).

Knowledge, skills, attitudes and social norms

Knowledge of recommended fruit and vegetable intake and of the poor nutritional quality of discretionary foods is not sufficient to predict intake. Consumption of nutritious food is also influenced by perceived barriers to purchasing and cooking, by perceived benefits of consumption and by social norms.

In 2012 a survey in 23 selected local government areas of Victoria showed that eating two or more serves of fruit per day was thought by 87 per cent to be the recommended amount (Department of Health and Human Services 2015). Yet, only 47 per cent of adults in Victoria eat sufficient fruit (ABS 2015b). For vegetables, 61 per cent of those surveyed thought that five serves of vegetables per day was about right and 37 per cent thought it too much. However, in Victoria only seven per cent of adults eat sufficient vegetables (ABS 2015b). The largest perceived barrier to eating vegetables was cost, with 32 per cent considering it somewhat or very much a barrier. Other common barriers were that vegetables perish too quickly (30 per cent), being too tired to cook (27 per cent) and poor quality of vegetables where they live (16 per cent).

Regular consumption of discretionary foods such as sugary drinks and fast food was the perceived social norm reported in the 2012 survey. Consumption of up to seven glasses of sugary drinks in
a fortnight or consumption of fast food twice a week was not typically disapproved of by others. Of the adults who consumed fast foods and sugary drinks, over half were very or extremely confident that they could eat or drink less most of the time. Despite this high reported self-efficacy, intake of these foods and drinks are high, with discretionary foods contributing about one-third of the daily intake of Victorians in 2011–12 (ABS 2015a).

Food security

Food security is fundamental to good health, and having the financial capacity to purchase sufficient and nutritious food is a critical factor. In 2008, in the preceding 12 months about one in five Aboriginal Victorian adults ran out of food and couldn’t afford to buy more (Figure 7) (Department of Health 2011). Rates were similar in metropolitan and rural areas of the state. Food insecurity for Aboriginal Victorians was about four times more common than for non-Aboriginal Victorians.

In 2011–12 one in 20 Victorian adults (4.6 per cent) ran out of food in the preceding 12 months and couldn’t afford to buy more, with similar rates for men and women (Department of Health 2014). Adults in rural areas were 45 per cent more likely to report running out of food than those in metropolitan areas. The rate in Victoria was similar to the national rate (ABS 2015a).

Figure 7: Proportion who ran out of food in the last 12 months and couldn’t afford to buy more, by age (2011–12) and indigenous status (2008), Victoria

Source: Victorian Population Health Surveys 2008 and 2011–12
Challenges and opportunities

Victoria is renowned for its diverse, healthy, sustainable and high-quality food, providing a major draw card for livability, recreation and tourism. Victorians enjoy an abundant and diverse food supply, with much of it grown or produced locally. We therefore have many opportunities to eat well and choose a healthy diet. With 92 per cent of fresh produce consumed in Australia produced in Australia (AFGC 2014) and an estimated $430 million per year boost to the horticulture industry by consumption of just one more serve of fruit and vegetables per person per day (Australian Chronic Disease Prevention Alliance 2004), increasing fruit and vegetable consumption is an opportunity for all.

The greatest dietary challenge facing many Victorians is the excessive availability, promotion and intake of discretionary foods that are energy-dense and high in sodium, saturated fat and added sugars and have little or no nutritional value. These foods and drinks (such as sugary drinks, fast foods, biscuits, cakes, snack foods, confectionary and alcohol) are readily available, heavily marketed and inexpensive. ‘Discretionary’ foods are no longer ‘treat’ or occasional foods as they have been in the past but have found their way into the everyday diet, several times a day.

More than one-third of daily energy (across all age groups from infants to the elderly) is derived from such foods – more than three times the maximum recommended for good health. In addition, portion sizes of all food, healthy and unhealthy, have increased, making it very easy for people to consume more energy than they require.

With so many Victorians eating outside of the home and enjoying the high-quality range of food outlets Victoria has to offer, there is an opportunity to further work with the our skilled food service sector on initiatives that provide and promote healthier meal and snack options when eating out.

Food is a great medium for building individual, communal, regional and societal connectedness. Celebrating our food – where it comes from, how we prepare it and with whom we share it – builds a vibrant healthy food culture. Food growers, producers, retailers and consumers are essential parts of our food system. Each sector can contribute to positive social, economic and health outcomes for all Victorians.

Healthy eating goes beyond individual knowledge and attitudes. For effective improvements in the dietary health of the population, a systems approach is required. The approach must include individual education and behavioural strategies but also initiatives that address the broader economic, social and physical environment factors that impact on the food system. Placing health at the centre of everyday lives by creating health-promoting environments within workplaces, early childhood services, parks, sport and recreation centres and communities makes health the default option.

References


Australia and New Zealand Food Authority (ANZFA) October 2014, Food Standards Code, (Standard 1.2.8 incorporating amendments up to and including (Proposal P1033 – Code Maintenance XII) Variation (October 2014).


National Health and Medical Research Council (NHMRC) 2012, Infant feeding guidelines, NHMRC Canberra.


Concepts

Prevalence: The number of people with a disease or condition at a specific point in time.

Soft drinks: For adults, the term ‘soft drink’ includes soft drinks, flavoured mineral water, cordial, energy drinks and sports drinks, (both non-diet and diet, intense sweetened and artificially sweetened versions) as used in the Victorian Population Health Survey (VPHS). Ready-to-drink alcoholic beverages are included in the sugar-sweetened beverages component of this VPHS ‘soft drink’ definition.

For children, the term ‘soft drinks’ includes soft drinks, flavoured mineral water, cordial, energy drinks and sports drinks, (both non-diet and diet, intense sweetened and artificially sweetened versions) as used in the Australian Health Survey. It does not include fruit drinks.

Non-alcoholic beverages: This group includes tea, coffee, juices, cordials, soft drinks, energy drinks and water, as used in the Australian Health Survey.

Discretionary foods and drinks: The 2013 Australian dietary guidelines lists examples of discretionary choices as including: ‘most sweet biscuits, cakes, desserts and pastries; processed meats and sausages; ice-cream and other ice confections; confectionary and chocolate; savoury pastries and pies; commercial burgers; commercially fried foods; potato chips, crisps and other fatty and/or salty snack foods; cream, butter and spreads which are high in saturated fats; sugar sweetened soft drinks and cordials, sports and energy drinks and alcoholic drinks’. These foods and drinks can provide excess energy (kilojoules), are high in added sodium, added sugars and/or saturated fat, and have little nutritional value.

Included within the guidelines is the recommendation to limit the serves of discretionary foods. Those who are sedentary or short for their age or sex, or trying to lose weight, should not eat any discretionary foods. Those who are a healthy weight, more active or taller than others, should not consume discretionary foods but if they do could consume up to three serves of discretionary foods a day – contributing about 10 per cent of total energy intake.

Only sometimes and in small amounts

A serve of vegetables can be:

- ½ cup cooked vegetables or cooked legumes
- 1 small potato
- 1 cup salad vegetables

A serve of fruit can be:

- 1 medium piece (e.g. apple)
- 2 small pieces (e.g. apricots)
- 1 cup chopped or canned fruit


## Recommended fruit and vegetable consumption (NHMRC 2013)

<table>
<thead>
<tr>
<th>Guidelines</th>
<th>Fruit serves (150 g)</th>
<th>Vegetable serves (75 g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children 2–3 years</td>
<td>1</td>
<td>2½</td>
</tr>
<tr>
<td>Children 4–8 years</td>
<td>1½</td>
<td>4½</td>
</tr>
<tr>
<td>Children 9–11 years</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Boys 12–18 years</td>
<td>2</td>
<td>5½</td>
</tr>
<tr>
<td>Girls 12–18 years</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Adult males</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Adult females</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Pregnant women</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Lactating women</td>
<td>2</td>
<td>7½</td>
</tr>
</tbody>
</table>

## Recommended breastfeeding and introduction of solid foods for infants (NHMRC 2012)

<table>
<thead>
<tr>
<th>Guidelines</th>
<th>Six months</th>
<th>12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth</td>
<td>Breastfeeding</td>
<td>Solid foods</td>
</tr>
<tr>
<td>Breastfeeding</td>
<td>Introduction of solids (around 6 months)</td>
<td>Introduction of cow’s milk</td>
</tr>
</tbody>
</table>

## Relevant polices and guidelines


Limitations
The data presented is based on self-report, whether by assessment of usual intake or 24-hour recall. The results may be subject to recall bias and should be interpreted with caution.

Provenance
Fruit and vegetable consumption, discretionary foods, sugar-sweetened beverages and nutrient intake is reported by the Australian Bureau of Statistics in the Australian Health Survey and the Australian Aboriginal and Torres Strait Islander Health Survey.

For more information


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Health status

The health status of Victoria’s population is determined by a range of social and community factors, as well as individual behaviours, and may be wholly or partially influenced by health services. This domain acknowledges the influence of these factors with measures of the prevalence of disease and the impact of disability, as well as measures of mortality and mental and social wellbeing. They provide insights into the level of health in the population, whether there are disparities in health and where opportunities for future improvement may exist.

Most of the measures, or indicators, under this domain are well established and derived from ongoing data sources that will allow for tracking progress over time, with acceptable levels of data quality. Collectively, they summarise the impact of mortality and morbidity on the overall health of the population. The indicators are organised under four dimensions, each measuring a different aspect of health status:

- **Wellbeing**: Measures of physical, mental and social wellbeing
  - Self-reported health
  - Mental health
  - Child abuse and neglect
  - Feeling valued by society

- **Health conditions**: The prevalence of disease, disorder, injury or trauma or other health-related states
  - Cancer incidence
  - Breast cancer incidence
  - Lung cancer incidence
  - Bowel cancer incidence
  - Prevalence of heart disease
  - Prevalence of diabetes
  - Oral health status
  - Injury and poisoning hospital admissions

- **Human function**: Alterations to body structure or function (impairment), activity limitations and restrictions in participation
  - Birth defects
  - Low birth weight
  - Prevalence of stroke
  - Unintentional hip fracture hospital admissions (people aged 75 years or older)

- **Deaths**: Mortality rates and life expectancy
  - Life expectancy at birth
  - Health-adjusted life expectancy (HALE)
  - Perinatal mortality
  - Avoidable mortality
  - Annual change in avoidable mortality rates
  - Intentional self-harm mortality (suicides)
  - Cancer survival
Wellbeing

Wellbeing includes measures of physical, mental and social wellbeing. The broad scope of this dimension captures elements of the quality of life of individuals in the population, as well as the impact of disability and disease. The indicators of wellbeing presented in this section of the report include:

**Self-reported health:** The proportion of adults aged 18 years or older with excellent, very good, good, fair or poor health, by age group.

**Mental health:** There are two measures included in this indicator:
- Psychological distress: The proportion of adults aged 18 years or older experiencing low, moderate, high and very high levels of distress, as measured using the Kessler 10 Psychological Distress Scale, by sex and age group.
- Depression: The proportion of adults who have ever been diagnosed with depression by a doctor in their lifetime, by sex and age group.

**Child abuse and neglect:** The number of children aged 0–17 years who were the subject of child abuse and neglect substantiations, per 1,000 population.

**Feeling valued by society:** The proportion of adults aged 18 years or older who felt/did not feel valued by society.
Self-reported health

Description

The proportion of adults aged 18 years or older with excellent, very good, good, fair or poor health, by age group

Self-reported health status is a commonly used measure of overall health that reflects a person’s perception of his or her own health at a given point in time. It has been shown to be a reliable predictor of future healthcare use and mortality, independent of other medical, behavioural or psychosocial risk factors (Burstrom & Fredlund 2001; DeSalvo et al. 2005; Idler & Benyami 1997; Miiunpalo, Vuori & Oja 1997).

In 2011–12, 46.6 per cent of adult Victorians reported their health as excellent or very good, 37.2 per cent reported their health as good, while 16.0 per cent of people reported their health as fair or poor. There were no differences in self-reported health status between men and women.

The proportion of people reporting excellent, very good, good, fair or poor health did not vary significantly over time between 2001 and 2011–12 (Figure 8).

The 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey found that 72.0 per cent of Aboriginal Victorians reported their health as excellent, very good or good, while 28.0 per cent reported their health as fair or poor. Overall, Aboriginal Australians were more than twice as likely as non-Aboriginal Australians to rate their health as fair or poor, and this had not changed between 2001 and 2012–13 (ABS 2014).

Figure 8: Self-reported health status, by year, Victoria, 2005 to 2011–12

Data are age-standardised to the 2011 Victorian population.

95% CI = 95 per cent confidence interval

Ordinary least squares regression was used to test for trends over time.

Source: Victorian Population Health Surveys 2001 to 2011–2012
Half of adults report their health as excellent or very good – a good predictor of actual health.

Figure 9 shows Victoria’s self-reported health status by age group.

**Figure 9: Self-reported health status, by age group, Victoria, 2011–12**

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Excellent/very good</th>
<th>Good</th>
<th>Fair/poor</th>
</tr>
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<tbody>
<tr>
<td>18–24</td>
<td>30</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td>25–34</td>
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<td>35–44</td>
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<td>55–64</td>
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<td>30</td>
</tr>
<tr>
<td>65+</td>
<td>60</td>
<td>20</td>
<td>30</td>
</tr>
</tbody>
</table>

Note that figures may not add up to 100 per cent due to a proportion of ‘don’t know’ or ‘refused’ responses.

Data are age-standardised to the 2011 Victorian population.

Source: Victorian Population Health Survey 2011–12

**References**


**Concepts**

Self-reported health: Respondents were asked to summarise their perceptions of their health status by indicating whether, in general, they would say their health was excellent, very good, good, fair or poor.

Aboriginal status: In accordance with *The health and wellbeing of Aboriginal Victorians: Victorian Population Health Survey 2008 supplementary report* the term ‘Aboriginal’ is taken to include both Aboriginal and Torres Strait Islander people (Department of Health 2011).

**Provenance**

Self-reported health is included as an indicator in the Australian Bureau of Statistics Australian Health Survey.

**For more information**

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Mental health

Description

There are two measures included in this indicator:

1. Psychological distress: The proportion of adults aged 18 years or older experiencing low, moderate, high and very high levels of distress, as measured using the Kessler 10 Psychological Distress Scale, by sex and age group
2. Depression and anxiety: The proportion of adults who have ever in their lifetime been diagnosed with depression and/or anxiety by a doctor, by sex and age group

Good mental health is fundamental to the wellbeing of individuals, their families and the wider community. Findings from the National Survey of Mental Health and Wellbeing 2007 (ABS 2008) showed that anxiety-related problems and mood (affective) problems were the most commonly reported mental health and behavioural problems. Australia-wide, these problems were self-reported by one in five Australians aged 16–85 years (ABS 2008). More recently, the Australian Health Survey reported that in 2011–12 around one in 10 adults (10.8 per cent) experienced high or very high levels of psychological distress (ABS 2012).

Psychological distress impacts negatively on health through a number of pathways both directly and indirectly. In addition to being a risk factor for depression and anxiety, psychological distress has been shown to exacerbate poor health, be a risk factor for the development of diseases such as coronary heart disease and stroke, and to increase engagement in lifestyle risk factors, such as smoking, drug use and excessive alcohol consumption (Hamer et al. 2012; Holden et al. 2010; Stansfeld et al. 2002). Moreover, psychological distress is associated with a higher risk of mortality, even after adjusting for potential confounders such as socioeconomic status (Pratt 2009).

There is strong and consistent evidence of an association between depression and anxiety and physical illness in each of the national health priority area disease groups (Clark & Currie 2009). Depression is also associated with poorer health outcomes in those with physical diseases.

The Kessler 10 Psychological Distress Scale (K10) is a tool designed to assess psychological distress. The K10 cannot be used to determine the presence of major illnesses, but it has been validated as a simple indicator of anxiety, depression and worry at a population level (Kessler et al. 2002). The K10 is a set of 10 questions about psychological distress, including the level of nervousness, hopelessness, restlessness, sadness and worthlessness, experienced in the four-week period prior to the interview. In general, the higher the K10 score, the greater the likelihood that a person is experiencing psychological distress. A maximum score of 50 indicates severe psychological distress and lower scores indicate lower levels of distress.

In 2011–12 the majority of Victorians aged 18 years or older (64.6 per cent) reported low levels of psychological distress in the four weeks preceding the survey. A significantly higher proportion of women reported high (9.5 per cent) or very high (3.5 per cent) levels of psychological distress.
distress compared with their male counterparts (7.3 per cent and 1.7 per cent, respectively). Psychological distress declined with age in both sexes, with those aged 65 years or older less likely to be distressed (see Table 3).

Table 3: Kessler 10 scores by category, sex and age group, Victoria, 2011–12

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Low (10–15) 95% CI</th>
<th>Moderate (16–21) 95% CI</th>
<th>High (22–29) 95% CI</th>
<th>Very high (30–50) 95% CI</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>% LL</td>
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<td>% LL</td>
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<tr>
<td>Males</td>
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</tr>
<tr>
<td>18–24</td>
<td>61.5</td>
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<td>All males</td>
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<tr>
<td>Females</td>
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<td>64.0</td>
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<td>66.0</td>
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<td>All females</td>
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<td>All persons</td>
<td>64.6</td>
<td>63.6</td>
<td>65.6</td>
<td>21.5</td>
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</tbody>
</table>

LL/UL 95% CI = lower/upper limit of 95 per cent confidence interval
Note that figures may not add up to 100 per cent due to a proportion of ‘don’t know’ or ‘refused’ responses.
Data are age-standardised to the 2011 Victorian population.
* Estimate has a relative standard error of between 25 and 50 per cent and should be interpreted with caution.
Source: Victorian Population Health Survey 2011–12
The Victorian Population Health Survey asked respondents if they had ever been diagnosed with depression and/or anxiety by a doctor. In 2011–12 almost twice as many women (25.1 per cent) than men (14.7 per cent) reported having ever been diagnosed with depression and/or anxiety. Men aged 35–65 years and women aged 25–64 years were more likely to report depression and anxiety than those who were younger or older (Table 4).

### Table 4: Lifetime prevalence of doctor-diagnosed depression and/or anxiety, by age and sex, Victoria, 2011–12

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Males 95% CI</th>
<th></th>
<th>Females 95% CI</th>
<th></th>
<th>Persons 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
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<td>UL</td>
<td>%</td>
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<tr>
<td>18–24</td>
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<td>25–34</td>
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<td>16.0</td>
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<td>35–44</td>
<td>16.4</td>
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<td>16.0</td>
<td>14.2</td>
<td>18.1</td>
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<td>55–64</td>
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<td>16.3</td>
<td>20.2</td>
<td>26.4</td>
<td>24.5</td>
</tr>
<tr>
<td>65+</td>
<td>12.8</td>
<td>11.4</td>
<td>14.2</td>
<td>20.2</td>
<td>18.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>14.7</td>
<td>13.7</td>
<td>15.7</td>
<td>25.1</td>
<td>24.0</td>
</tr>
</tbody>
</table>

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

Data are crude estimates, except for the totals, which represent the estimates for Victoria that were age-standardised to the 2011 Victorian population.

Source: Victorian Population Health Survey 2011–12

The 2008 Victorian Population Health Survey (VPHS) reported that Aboriginal Victorians were significantly more likely to have experienced high or very high psychological distress levels (22.0 per cent, 95% CI: 16.2–29.1) compared with their non-Aboriginal counterparts (11.3 per cent, 95% CI: 10.7–11.8), and there were no differences between the sexes. Furthermore, Aboriginal Victorians (34.8 per cent, 95% CI: 27.4–43.0) were significantly more likely than non-Aboriginal Victorians (19.6 per cent, 95% CI: 19.0–20.3) to have ever been diagnosed with depression or anxiety by a doctor. Of particular note is that the proportion of Aboriginal men (34.9 per cent, 95% CI: 24.5–47.0) ever diagnosed with depression or anxiety was more than twice that of their non-Aboriginal male counterparts (14.8 per cent, 95% CI: 13.9–15.7) (Department of Health 2011).

The 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey reported that 30 per cent of Aboriginal people aged 18 years or older had high or very high levels psychological distress. In contrast with the 2008 VPHS, women had a higher prevalence of psychological distress than their male counterparts at every age, except those aged 45–54 years. Similar to the 2008 VPHS, there was a significantly higher prevalence (nearly threefold) of psychological distress among Aboriginal compared with non-Aboriginal Australians. It should be noted, however, that while the trends can be compared, the absolute estimates cannot because of significant methodological differences between the two surveys, including the use of the shortened Kessler Psychological Distress Scale – the K5.
References


Concepts

Mental disorder: According to the ICD-10 (International Classification of Diseases – 10th revision) classification of mental and behavioural disorders, a disorder implies ‘the existence of a clinically recognisable set of symptoms or behaviour associated, in most cases, with distress and with interference with personal function’ (WHO 1992, p. 5). Most diagnoses require criteria relating to severity and duration to be met.

Mental health problem: Problems with mental health, such as worry or sadness, regardless of whether or not they meet criteria for mental disorders.

Psychological distress: The Kessler 10 Psychological Distress Scale was designed to monitor population prevalence and trends in non-specific psychological distress (Kessler et al. 2002). The K10 consists of 10 questions that have the same response categories based on the amount of time an individual reported experiencing the particular problem: all of the time, most of the time, some of the time, a little of the time and none of the time (that are scored 5 through to 1). The 10 items are summed to yield scores ranging from 10 to 50. Individuals are categorised to four levels of psychological distress based on their score: low (< 16), moderate (16–21), high (22–29) and very high (30–50).

The K10 does not include questions to identify psychosis, as this is difficult using a brief questionnaire. The K10 instrument may be appropriate to estimate the needs of the population for community mental health services, however, as people with psychosis generally get depressed (Andrews & Slade 2001).

Aboriginal status: In accordance with The health and wellbeing of Aboriginal Victorians: Victorian Population Health Survey 2008 supplementary report the term ‘Aboriginal’ is taken to include both Aboriginal and Torres Strait Islander people.

Prevalence: The number of people with a disease or condition at a specific point in time.

Lifetime prevalence: The number of people who have had a disease or condition at some point in their life (up to the time of assessment).

Provenance

The K10 Psychological Distress Scale is used in population health surveys internationally and throughout Australia, including by the Australian Bureau of Statistics (Slade, Grove & Burgess 2011).
For more information
Australian Bureau of Statistics (ABS), *Use of the Kessler Psychological Distress Scale in ABS health surveys*
http://www.abs.gov.au/ausstats/abs@.nsf/mf/4817.0.55.001

Australian Mental Health Outcomes and Classification Network (AMHOCN) 2005, *Kessler-10 training manual*, AMHOCN, Parramatta

Department of Health, *Victorian Population Health Survey*

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Child abuse and neglect

Description
The number of children aged 0–17 years who were the subject of child abuse and neglect substantiations, as a rate per 1,000 population

In Australia, child protection is the responsibility of state and territory departments in the community services sector. In Victoria, a child protection notification is assessed by the Victorian Department of Health and Human Services to determine: whether it requires an investigation; whether it should be dealt with by other means, such as referral to other organisations or to family support services; or whether no further protective action is necessary or possible. Victoria’s legislative foundation is provided by the Child Wellbeing and Safety Act 2005 (which is the framework legislation for services for all children) and the Children, Youth and Families Act 2005.

After an investigation is finalised, a notification is classified as ‘substantiated’ or ‘not substantiated’. A notification is substantiated where it is concluded after investigation that the child has been, is being or is likely to be, abused, neglected or otherwise harmed. All jurisdictions substantiate situations where children have experienced significant harm from abuse and neglect through the actions of parents. Some jurisdictions also substantiate on the basis of the occurrence of an incident of abuse or neglect, independent of whether the child was harmed, and others substantiate on the basis of the child being at risk of harm occurring.

Across states and territories, rates of children who were the subject of substantiations have fluctuated over the past five years. Since 2008–09, rates have increased for New South Wales, Victoria, Queensland, Western Australia and the Northern Territory and decreased for South Australia, Tasmania and the Australian Capital Territory. The largest increase over this period was for the Northern Territory. Over the past 12 months, rates have increased in New South Wales and Victoria, decreased in the Australian Capital Territory and the Northern Territory and remained stable in Queensland, South Australia, Western Australia and Tasmania (AIHW 2014) (Table 5).
Table 5: Rates for children aged 0–17 years who were the subject of a substantiation of a notification received during the relevant year, by state and territory, 2008–09 to 2012–13 (per 1,000 children)

<table>
<thead>
<tr>
<th>Year</th>
<th>NSWa</th>
<th>Vic.</th>
<th>Qldb</th>
<th>WA^cd</th>
<th>SAe</th>
<th>Tas.</th>
<th>ACT</th>
<th>NT</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008–09</td>
<td>8.7</td>
<td>5.0</td>
<td>6.3</td>
<td>2.8</td>
<td>5.4</td>
<td>9.1</td>
<td>7.8</td>
<td>12.3</td>
<td>6.5</td>
</tr>
<tr>
<td>2009–10</td>
<td>8.0</td>
<td>5.2</td>
<td>5.7</td>
<td>2.9</td>
<td>4.2</td>
<td>7.4</td>
<td>7.0</td>
<td>16.6</td>
<td>6.1</td>
</tr>
<tr>
<td>2010–11</td>
<td>7.0</td>
<td>5.9</td>
<td>5.4</td>
<td>3.4</td>
<td>5.1</td>
<td>9.5</td>
<td>5.8</td>
<td>22.8</td>
<td>6.1</td>
</tr>
<tr>
<td>2011–12gf</td>
<td>9.0</td>
<td>7.1</td>
<td>6.5</td>
<td>4.7</td>
<td>5.1</td>
<td>8.1</td>
<td>6.9</td>
<td>24.4</td>
<td>7.4</td>
</tr>
<tr>
<td>2012–13</td>
<td>9.8</td>
<td>8.1</td>
<td>6.5</td>
<td>4.7</td>
<td>5.2</td>
<td>8.0</td>
<td>5.9</td>
<td>19.2</td>
<td>7.8</td>
</tr>
</tbody>
</table>

a. New South Wales figures are not comparable with those of other jurisdictions. New South Wales has a differential investigation response whereby an investigation can be undertaken over two stages (stage 1 – information gathering; stage 2 – assessment). Only the more serious cases that receive the higher level response may lead to a recorded substantiation outcome. Following the New South Wales ‘Keep Them Safe’ reforms, the 2010–11 data reflect the first full year of reporting under legislative changes to the New South Wales Children and Young Persons (Care and Protection) Act 1998, proclaimed on 24 January 2010. This includes raising the reporting threshold from ‘risk of harm’ to the new ‘risk of significant harm’.

b. During 2011–12, additional staff focused on investigations and assessments were deployed across Queensland. This resulted in a decrease in the number of investigations not yet finalised and an increase in the number of investigations with a finalised outcome of ‘substantiated’, ‘unsubstantiated’ or ‘no investigation and assessment’ outcome.

c. Data for 2009–10 for Western Australia are not comparable with other years due to the introduction of a new client information system in March 2010. Proxy data were provided for that year.

d. For 2010–11, Western Australia was unable to report a child’s characteristics based on their first substantiation. As a result, a small number of children may be double-counted in this table where they have more than one substantiation and the notifications had differing characteristics, such as age or abuse type.

e. During 2009–10, South Australia implemented a new client information system and this was accompanied by policy and practice changes. Therefore, data for this year are not fully comparable with previous years’ data.

f. The ABS has improved the methodology used to obtain estimates of the resident population, which has caused a downward revision of the 2011–12 estimates based on the 2011 Census. Due to these changes, comparisons of rates over time should be interpreted with caution.

g. Rates for 2012 for Tasmania should not be compared with previous years due to the change in the methodology used to obtain estimates of the resident population.

Notes:
1. Unborn children are included in rate calculations.
2. Children may have been the subject of more than one substantiation.

Source: AIHW 2014

Aboriginal children continue to be over-represented in the child protection system. In Victoria in 2012–13, Aboriginal children were 9.4 times more likely to be the subject of a child protection substantiation than non-Aboriginal children (68.6 per 1,000 compared with 7.3 per 1,000) (AIHW 2014).

References
Concepts

Substantiated: A finalised investigation is classified as ‘substantiated’ where there is reasonable cause to believe that the child has been, is being, or is likely to be, abused or neglected or otherwise harmed. Substantiation does not necessarily require sufficient evidence for a successful prosecution and does not imply that treatment or case management was, or is to be, provided.

Aboriginal status: In accordance with The health and wellbeing of Aboriginal Victorians: Victorian Population Health Survey 2008 supplementary report the term ‘Aboriginal’ is taken to include both Aboriginal and Torres Strait Islander people.

Provenance

Child abuse notifications are reported by the Australian Institute of Health and Welfare.

For more information


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Feeling valued by society

Description
The proportion of adults aged 18 years or older who felt or did not feel valued by society

Social and civic trust are important indicators of social capital that enable cooperative and altruistic behaviours to enhance the collective wellbeing and the attainment of collective goals. For example, trust in our civic institutions and the people who run them (for example, the healthcare system) is essential for maximising an individual’s health and wellbeing. Feeling valued by society is an indicator of civic trust.

While there is no universally agreed definition of social capital, the ‘social cohesion approach’ defines social capital by its function: the trustworthiness of the social environment makes possible reciprocity exchanges, norms and sanctions (Bird et al. 2010). Deficits in social capital have been shown to impact negatively on health and wellbeing. For example, a lack of adequate social support and connections has consistently been linked to depressive symptoms (Kawachi & Berkman 2001). In turn, depressive symptoms have been consistently linked with poorer health outcomes (Clark & Currie 2009).

Trust may be the one measure that comes closest to being a single measure of social capital. Countries with very high social capital are fairer, more equitable, have less social problems, and often economically outperform countries with low social capital (Helliwell et al. 2005).

The Victorian Population Health Survey includes two questions on civic trust: whether people felt valued by society and whether people believed there were opportunities to have a real say on important issues. In 2011–12, survey estimates indicated that although most adults aged 18 years or older in Victoria felt valued, about one in eight people (12.1 per cent) felt that they were not, or not often, valued by society. The proportion of adults aged 18 years or older who felt or did not feel valued by society remained unchanged between 2005 and 2012 (Figure 10).

One in eight adults do not feel valued by society; double for Aboriginal Victorians.
Figure 10: Proportion of adults, aged 18 years or older, who felt or did not feel valued by society, Victoria, 2005 to 2011–12

Note that the figures may not add up to 100 per cent due to a proportion of ‘don’t know’ or ‘refused’ responses.
Data are age-standardised to the 2006 Victorian population.
Ordinary least squares linear regression was used to test for trends over time.
Source: Victorian Population Health Surveys 2001 to 2011–12
The 2008 Victorian Population Health Survey reported that a higher proportion of both Aboriginal men and women did not feel valued by society compared with their non-Aboriginal counterparts (Department of Health 2011) (Table 6).

Table 6: Proportion of adults who felt valued by society, by sex and Aboriginal status, Victoria, 2008

<table>
<thead>
<tr>
<th></th>
<th>Aboriginal 95% CI</th>
<th>Non-Aboriginal 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>LL</td>
</tr>
<tr>
<td><strong>Males</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No or not often</td>
<td>19.0*</td>
<td>11.3</td>
</tr>
<tr>
<td>Sometimes</td>
<td>29.5</td>
<td>19.4</td>
</tr>
<tr>
<td>Yes</td>
<td>44.4</td>
<td>32.8</td>
</tr>
<tr>
<td>Don’t know or refused to say</td>
<td>7.1*</td>
<td>3.1</td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No or not often</td>
<td>17.6</td>
<td>11.0</td>
</tr>
<tr>
<td>Sometimes</td>
<td>26.8</td>
<td>19.4</td>
</tr>
<tr>
<td>Yes</td>
<td>50.6</td>
<td>41.2</td>
</tr>
<tr>
<td>Don’t know or refused to say</td>
<td>4.9*</td>
<td>2.3</td>
</tr>
<tr>
<td><strong>Persons</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No or not often</td>
<td>17.7</td>
<td>12.2</td>
</tr>
<tr>
<td>Sometimes</td>
<td>27.7</td>
<td>21.1</td>
</tr>
<tr>
<td>Yes</td>
<td>48.4</td>
<td>40.7</td>
</tr>
<tr>
<td>Don’t know or refused to say</td>
<td>6.1*</td>
<td>3.4</td>
</tr>
</tbody>
</table>

95% CI = 95 per cent confidence interval
Data are age-standardised to the 2006 Victorian population.
* Estimate has a relative standard error (RSE) between 25 and 50 per cent and should be interpreted with caution.
References


Concepts

Aboriginal status: In accordance with The health and wellbeing of Aboriginal Victorians: Victorian Population Health Survey 2008 supplementary report the term ‘Aboriginal’ is taken to include both Aboriginal and Torres Strait Islander people.

Provenance

Victorian Population Health Survey

For more information

Department of Health, Victorian Population Health Survey

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Health conditions

This dimension includes the prevalence of disease, disorder, injury or trauma or other health-related states. Information about the prevalence and incidence of disease and injury can be used as baseline measures against which the progress and effectiveness of health strategies and other initiatives may be gauged. The indicators for this dimension include the following.

**Cancer incidence**: The number of new cancer diagnoses in a defined population over a specified time period, expressed as a rate per 100,000 people.

**Breast cancer incidence**: The number of new cases of breast cancer in the female population over a specified time period, expressed as a rate per 100,000 females.

**Lung cancer incidence**: The number of new cases of lung cancer in the population over a specified time period, expressed as a rate per 100,000 people.

**Bowel cancer incidence**: The number of new cases of bowel cancer in the population over a specified time period, expressed as a rate per 100,000 people.

**Prevalence of heart disease**: The proportion of adults aged 18 years or older who have ever been diagnosed with heart disease by a doctor.

**Prevalence of diabetes**: The proportion of adults aged 18 years or older who have ever been diagnosed with diabetes by a doctor.

**Oral health status**: There are two measures included in this indicator:

1. Adults: The proportion of adults aged 18 years or older with excellent, very good, good, fair or poor health, by age group.
2. Children: Standardised hospital admission rates (per 1,000 people) for dental ambulatory care sensitive conditions (ACSC) for children aged 0–9 years.

**Injury and poisoning hospital admissions**: The number and rate of admissions (hospitalisations) to public and private hospitals in Victoria due to all causes of injury and poisoning.
Cancer incidence

Description
The number of new cancer diagnoses in a defined population over a specified time period, expressed as a rate per 100,000 people.

The term ‘cancer’ refers to a group of more than 100 diseases characterised by uncontrolled growth and the spread of abnormal cells. Cancers are distinguished from one another by the location in the body in which the disease began and/or by the type of cell involved. Different types of cancers have different causes and different rates of occurrence and survival. Therefore, different types of cancers in a community or workplace do not necessarily have the same cause.

Cancers may be caused by a variety of factors acting alone or together, usually over a period of many years. For most cancers the causes are not fully understood. However, some factors that place individuals at a greater risk for cancer are well recognised. Lifestyle factors that increase the risk for specific cancers include tobacco use, excessive alcohol consumption, poor diet (with excess calories, high in fat and low in fruits, vegetables or fibre), obesity and physical inactivity, and exposure to ultraviolet light from the sun (AIHW & Australian Association of Cancer Registries 2012). Other important risk factors include occupational exposures, environmental factors and reproductive and hormonal factors in women. A family history of cancer may also increase the chance of developing cancer (AIHW & Australian Association of Cancer Registries 2012). The incidence of cancer increases with age. In 2012 it was estimated that 75 per cent of new cancer cases were diagnosed in men and 65 per cent in women aged 60 or older (AIHW & Australian Association of Cancer Registries 2012) (Figure 11).
Cancer is a leading cause of disease burden in Victoria. There were 29,738 new cases of cancer in Victoria in 2013, 15,946 in males and 13,792 in females. The age-standardised incidence rate for all cancers in 2010 was 531.7 per 100,000 males and 412.7 per 100,000 females (Cancer Council Victoria 2014).

Cancer incidence is age-dependent, with less than one per cent of tumours occurring before age 15, and 59 per cent in people aged over 65 years (Thursfield, Giles & Farrugia 2014). At least one in three Victorians will develop a cancer by the age of 75, with risks of over one in three for males and one in four for females (Thursfield et al. 2014).

Breast cancer is the most common new cancer in Victorian women, with almost 4,075 diagnoses in 2013 (29.5 per cent of all cancers). Prostate cancer remains the most common new cancer in Victorian men, with 4,257 new diagnoses in 2014 (27 per cent of all cancers). Overall, the five most common cancers in Victoria are prostate, breast, bowel, lung and melanoma, which together account for almost 60 per cent of all new cancers and half of all cancer deaths (Thursfield et al. 2014) (Figure 12).

There were 529 cancer diagnoses reported for Aboriginal Victorians in the five-year period 2008–2013; this is an average of 106 new diagnoses each year. Cancer incidence was slightly higher for females (52 per cent) than for males (48 per cent) (Thursfield et al. 2014). The most common cancers for Aboriginal Victorians were lung, bowel, breast, prostate, lymphoma, melanoma, head and neck and kidney.

Mortality rates for cancer have declined steadily since 1982, with a 1.4 per cent decline for males and 1.1 per cent for females between 1982 and 2013 (Thursfield et al. 2014) (Table 7). This reflects earlier detection of cancers through screening, falling tobacco use, especially by males, and improved treatments.
### Table 7: Cancer incidence rate and number of new cases, by sex, Victoria, 1982–2013

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate per 100,000 persons</th>
<th>Number of new cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
<td>Females</td>
</tr>
<tr>
<td>1982</td>
<td>478.4</td>
<td>333.6</td>
</tr>
<tr>
<td>1983</td>
<td>477.2</td>
<td>333.8</td>
</tr>
<tr>
<td>1984</td>
<td>489.4</td>
<td>347.6</td>
</tr>
<tr>
<td>1985</td>
<td>488.2</td>
<td>349.1</td>
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<tr>
<td>1986</td>
<td>475.3</td>
<td>342.0</td>
</tr>
<tr>
<td>1987</td>
<td>481.8</td>
<td>359.3</td>
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<td>1988</td>
<td>490.7</td>
<td>354.3</td>
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<tr>
<td>1989</td>
<td>505.5</td>
<td>357.1</td>
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<tr>
<td>1990</td>
<td>521.9</td>
<td>361.4</td>
</tr>
<tr>
<td>1991</td>
<td>522.2</td>
<td>375.6</td>
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<tr>
<td>1992</td>
<td>537.6</td>
<td>377.9</td>
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<tr>
<td>1993</td>
<td>569.5</td>
<td>376.7</td>
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<td>1994</td>
<td>592.4</td>
<td>406.6</td>
</tr>
<tr>
<td>1995</td>
<td>581.1</td>
<td>401.6</td>
</tr>
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<td>1996</td>
<td>561.4</td>
<td>398.0</td>
</tr>
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<td>1997</td>
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<td>1998</td>
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<td>2003</td>
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<td>2007</td>
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<td>2011</td>
<td>567.4</td>
<td>403.9</td>
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<td>2012</td>
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</tr>
<tr>
<td>2013</td>
<td>531.7</td>
<td>412.7</td>
</tr>
</tbody>
</table>

Data are standardised to the 2001 Victorian population.
Source: Cancer Council Victoria, Victorian Cancer Registry, 1 December 2014
Figure 12: Top 10 leading cancers (total new cases), by sex, Victoria, 2013

Source: Thursfield et al. 2014
* Myelodysplasia is a premalignant condition which progresses in many cases to acute myeloid leukaemia.

References


Concepts

Incidence: Refers to the rate at which new cases of disease occur in a population during a specified period.

Aboriginal status: In accordance with The health and wellbeing of Aboriginal Victorians: Victorian Population Health Survey 2008 supplementary report the term ‘Aboriginal’ is taken to include both Aboriginal and Torres Strait Islander people.

Limitations

Sometimes measurement of incidence is complicated by changes in the population at risk during the period when cases are ascertained, for example, through births, deaths or migration.

It should be noted that once a person is classified as a case, he or she is no longer liable to become a new case, and therefore should not contribute further person-years at risk. Sometimes the same pathological event happens more than once to the same individual. In these circumstances the definition of incidence is usually restricted to the first event, although sometimes (for example in the study of infectious diseases) it is more appropriate to count all episodes.

Provenance

Cancer incidence rates are reported by the Australian Institute of Health and Welfare, the World Health Organization and the Victorian Cancer Registry.

For more information

Cancer Council Victoria, Victorian Cancer Registry interactive reports
http://vcrdata.cancervic.org.au:8082/ccv/

Better Health Channel – Cancer

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Breast cancer incidence

Description
The number of new cases of breast cancer in the female population over a specified time period, expressed as a rate per 100,000 females

Breast cancer is the most common cancer occurring in Victorian women (Thursfield, Giles & Farrugia 2014). There is an increased risk of developing female breast cancer with older age, obesity, consumption of alcohol, early onset of menstruation, later menopause, non-parity, low fertility and delayed age of having a first child, as well as having had a first degree female relative with the disease (AIHW & Cancer Australia 2012). Lifetime risk of breast cancer is strongly associated with mutations in the BRCA1 and BRCA2 genes (Chen & Parmigiani 2007). Oral contraceptive use and/or hormone replacement therapy within the past 10 years have also been shown to increase the risk of developing the disease (AIHW & Cancer Australia 2012). Although men can develop breast cancer, it remains relatively rare. The main risk factors associated with breast cancer in men are genetic factors and conditions involving high levels of oestrogen (AIHW & Cancer Australia 2012).

In 2013 breast cancer was the second most common new cancer overall, accounting for 13.8 per cent (4,108) of new cases and 29.5 per cent (4,075) of all cancers for women. It was the fourth ranking cause of cancer death (699 deaths, 6.3 per cent) (Thursfield et al. 2014).

Breast cancer incidence rates continue to increase slowly, after a decade of more rapid increase, largely due to mammographic screening (Thursfield et al. 2014) (Figure 13). In the 20 years since 1994, the age-standardised rate of invasive breast cancer in Victorian women only increased by 0.1 per cent per annum (Thursfield et al. 2014). Five-year relative survival from breast cancer for women who were diagnosed in 2008–12 was 90 per cent, an increase from 73 per cent 20 years ago (Thursfield et al. 2014). Overall, the breast cancer mortality rate in Victorian women has declined by 2.5 per cent per year over the 20-year period between 1994 and 2013, with a decrease observed across all age groups. This trend reflects advances in treatment, the success of the BreastScreen mammographic screening program and increased awareness and surveillance for women at high risk due to genetic factors (Thursfield et al. 2014).

More information is provided in the following sections of this report:

- Cancer survival
- Cervical cancer screening participation
Figure 13: Female breast cancer incidence, Victoria, 1982–2013

Rate per 100,000 persons

Data are age-standardised to the 2001 Victorian population.
Source: Cancer Council Victoria, Victorian Cancer Registry, 1 December 2014

References


**Concepts**

Incidence: Refers to the rate at which new cases of disease or condition occur in a population during a specified period.

Survival analysis: Five-year survival figures presented in Cancer Council Victoria publications show the estimated proportion of Victorians with a particular cancer who have survived at least five years from their diagnosis, relative to people in the general population. Known as ‘period’ survival analysis, this uses only the most recent interval survival estimate for cases diagnosed in different calendar years (cross-sectional estimate of survival) (Thursfield et al. 2014).

**Limitations**

Sometimes measurement of incidence is complicated by changes in the population at risk during the period when cases are ascertained, for example, through births, deaths or migration.

It should be noted that once a person is classified as a case, he or she is no longer liable to become a new case, and therefore should not contribute further person-years at risk. Sometimes the same pathological event happens more than once to the same individual. In these circumstances the definition of incidence is usually restricted to the first event, although sometimes (for example in the study of infectious diseases) it is more appropriate to count all episodes.

**Provenance**

Cancer incidence rates are reported by the Australian Institute of Health and Welfare, the World Health Organization and the Victorian Cancer Registry.

**For more information**

Cancer Council Victoria, *Victorian Cancer Registry interactive reports*

Better Health Channel – Breast cancer

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Lung cancer incidence

**Description**

The number of new cases of lung cancer in the population over a specified time period, expressed as a rate per 100,000 people.

Lung cancer is an aggressive form of cancer originating in the trachea, windpipe and lung. The disease has a low cure rate and short survival time. The five-year relative survival rate for lung cancer in men was 12 per cent and 16 per cent for women in Victoria in 2010 (Thursfield et al. 2012). Overall, there has been a significant increase from eight per cent to 14 per cent in survival over the 20-year period from 1986–1990 to 2006–2010 (Thursfield et al. 2012).

Tobacco smoking is the major risk factor for lung cancer and the evidence suggests that in populations with prolonged cigarette use, more than 90 per cent of cases of lung cancer are attributable to smoking (Scollo & Winstanley 2012). The risk of lung cancer increases with the number of cigarettes smoked and the duration of smoking. Additionally, exposure to environmental tobacco smoke, asbestos, uranium, chromium, nickel and radon are also risk factors for lung cancer (AIHW & Cancer Australia 2011). While it is now suggested that there is little, if any, difference between females and males in their vulnerability to the carcinogenic effects of cigarette smoke, there is mounting evidence to suggest that the biology of lung cancer differs between the sexes (Scollo & Winstanley 2012).

Lung cancer was again the fourth most common site of new cancer (2,657 new cases) in 2013 and remains the leading cause of cancer death (2,076 deaths, 19 per cent of all cancer deaths) (Thursfield, Giles & Farrugia 2014). Incidence and mortality rates continue to decline for men and appear to have reached a plateau for women (Thursfield et al. 2014) (Figure 14). The latter suggests a similar pattern to trends in lung cancer in men where rapid decreases in mortality rates followed a peak in the early 1980s, 40 years after smoking prevalence peaked. With smoking prevalence among women peaking in the early 1980s, it is possible that a decline in female lung cancer rates may follow the observed plateau (Thursfield et al. 2014).

More information is provided in the *Cancer survival* section of this report.
Figure 14: Lung cancer incidence, by sex, Victoria, 1982–2013

Data are age-standardised to the 2001 Victorian population.
Source: Cancer Council Victoria, Victorian Cancer Registry, 2 December 2014

References
Australian Institute of Health and Welfare (AIHW) & Cancer Australia 2011, Lung cancer in Australia: an overview, Cancer series no. 64, cat. no. CAN 58, AIHW, Canberra.


Concepts
Incidence: Refers to the rate at which new cases of disease occur in a population during a specified period.

Limitations
Sometimes measurement of incidence is complicated by changes in the population at risk during the period when cases are ascertained, for example, through births, deaths or migration.

It should be noted that once a person is classified as a case, he or she is no longer liable to become a new case, and therefore should not contribute further person-years at risk. Sometimes the same pathological event happens more than once to the same individual. In these circumstances the definition of incidence is usually restricted to the first event, although sometimes (for example in the study of infectious diseases) it is more appropriate to count all episodes.

Provenance
Cancer incidence rates are reported by the Australian Institute of Health and Welfare, the World Health Organization and the Victorian Cancer Registry.

For more information
Cancer Council Victoria, Victorian Cancer Registry interactive reports

Better Health Channel – Lung cancer

Contact
Cancer Council Victoria
Cancer Epidemiology Centre
Telephone: (03) 9635 5000
Email: cec@cancervic.org.au
Bowel cancer incidence

**Description**
The number of new cases of bowel cancer in the population over a specified time period, expressed as a rate per 100,000 people

Bowel cancer, which includes cancers of the colon, recto-sigmoid junction and rectum, is a major cause of morbidity and mortality in Australia. There is an increased risk of developing bowel cancer with increasing age and a family history of the disease (AIHW & AACR 2012). Poor diet, especially a diet low in fibre, is an important risk factor for developing bowel cancer (WCRF/AICR 2007). Other lifestyle factors linked to the development of bowel cancer include physical inactivity, obesity and high levels of alcohol and red meat consumption (AIHW & AACR 2012; WCRF/AICR 2007).

Although bowel cancer may be present for many years before symptoms manifest, the disease can be successfully treated if detected in the early stages by screening including via the National Bowel Cancer Screening Program (NBCSP) or colonoscopy. The NBCSP aims to improve early detection and survival rates with two-yearly screening of people aged 50 years or older (AIHW 2014b). A project linking bowel screening records of people invited into the NBCSP in 2006–2008 with population-based datasets of bowel cancer diagnoses and national deaths information found that non-invitees had a 68 per cent higher risk of bowel cancer death by 31 December 2011, compared with NBCSP invitees (AIHW 2014a).

In 2013 bowel (colon and rectum) cancer was the third most common new cancer in Victorians, with 3,675 cases (12.0 per cent of all cancers). It was the second ranking site of fatal cancer (1,407 deaths, 13 per cent) (Thursfield, Giles & Farrugia 2014).

Although rates have shown a small decline in recent years, more so for men (Figure 15), it is too early to comment on whether this change is associated with the NBCSP (Thursfield et al. 2014).

More information is provided in the following sections of this report:

- **Cancer survival**
- **Bowel cancer screening participation**
Figure 15: Bowel cancer incidence, by sex, Victoria, 1982–2010

Data are age-standardised to the 2001 Victorian population.
Source: Cancer Council Victoria, Victorian Cancer Registry, 06 December 2014

References
Australian Institute of Health and Welfare (AIHW) 2014a, Analysis of bowel cancer outcomes for the National Bowel Cancer Screening Program, Cat. no. CAN 87, AIHW, Canberra.

Australian Institute of Health and Welfare (AIHW) 2014b, National Bowel Cancer Screening Program monitoring report: 2012–13, Cancer series, no. 84 CAN 81, AIHW, Canberra.


Concepts
Incidence: Refers to the rate at which new cases of disease occur in a population during a specified period.

Limitations
Sometimes measurement of incidence is complicated by changes in the population at risk during the period when cases are ascertained, for example, through births, deaths or migration.

It should be noted that once a person is classified as a case, he or she is no longer liable to become a new case, and therefore should not contribute further person-years at risk. Sometimes the same pathological event happens more than once to the same individual. In these circumstances the definition of incidence is usually restricted to the first event, although sometimes (for example in the study of infectious diseases) it is more appropriate to count all episodes.

Provenance
Cancer incidence rates are reported by the Australian Institute of Health and Welfare, the World Health Organization and the Victorian Cancer Registry.

For more information
Cancer Council Victoria interactive reports

Better Health Channel – Bowel cancer

Contact
Cancer Council Victoria
Cancer Epidemiology Centre
Telephone: (03) 9635 5000
Email: cec@cancervic.org.au
Prevalence of heart disease

Description
The proportion of adults aged 18 years or older who have ever been diagnosed with heart disease by a doctor

Ischaemic heart disease was the largest single cause of disability-adjusted life years for both men and women in 2001, accounting for about 10.3 per cent and 8.1 per cent of the total burden in Victorian men and women respectively (Department of Human Services 2005). Prevalence increases with age and the major risk factors associated with the disease include tobacco smoking, poor nutrition, overweight/obesity, insufficient physical activity, diabetes, high blood pressure and high cholesterol (AIHW 2014). The prevalence of heart disease provides insights into the level of resources required for prevention, health promotion and management of cardiovascular disease in the population.

Estimates from the Victorian Population Health Survey 2011–12 indicate that seven per cent of adults, aged 18 years or older, had ever been diagnosed with heart disease by a doctor (Figure 16). Self-reported prevalence was higher for men compared with women, and heart disease prevalence increased with age. Adults aged 55 years or older were more likely than adults in younger age groups to report having ever being diagnosed with heart disease. Prevalence of heart disease was about twice as high in men with an annual household income of less than $20,000 compared with those with incomes of $100,000 or more.

Heart disease prevalence is twice as common for males of low income as high income.
Figure 16: Prevalence of heart disease, by sex and age group, Victoria, 2011–12

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Males</th>
<th>95% CI</th>
<th>Females</th>
<th>95% CI</th>
<th>Persons</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>[LL, UL]</td>
<td>%</td>
<td>[LL, UL]</td>
<td>%</td>
<td>[LL, UL]</td>
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<tr>
<td>18–24</td>
<td>0.9*</td>
<td>[0.4, 2.0]</td>
<td>1.1*</td>
<td>[0.5, 2.5]</td>
<td>1.0*</td>
<td>[0.6, 1.7]</td>
</tr>
<tr>
<td>25–34</td>
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<td>[0.5, 3.4]</td>
<td>0.8*</td>
<td>[0.4, 1.7]</td>
<td>1.0*</td>
<td>[0.5, 2.0]</td>
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<tr>
<td>35–44</td>
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<td>[1.6, 3.7]</td>
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<td>[0.9, 2.4]</td>
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<td>45–54</td>
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<td>[3.1, 4.5]</td>
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<td>55–64</td>
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<td>[5.9, 8.1]</td>
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<td>[9.0, 11.1]</td>
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<tr>
<td>Total</td>
<td>8.7</td>
<td>[8.2, 9.3]</td>
<td>5.5</td>
<td>[5.1, 5.9]</td>
<td>7.0</td>
<td>[6.7, 7.3]</td>
</tr>
</tbody>
</table>

Data are crude estimates, except for the totals, which represent the estimate for Victoria and have been age-standardised to the 2011 Victorian population.

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

* Estimate has a relative standard error (RSE) of between 25 and 50 per cent and should be interpreted with caution.

Source: Victorian Population Health Survey 2011–12

The distribution in the prevalence of heart disease in the Victorian population by age, socioeconomic status and geographic location, along with changes in the prevalence of heart disease diabetes in Victoria between 2003 and 2011–12 are presented in the full report of the Victorian Population Health Survey 2011–12 (Department of Health 2014).

References


**Concepts**

Prevalence: The number of people with a disease at a specific point in time.

**Limitations**

The heart disease prevalence rates are derived from survey data obtained through self-report and should be interpreted with caution. They rely on respondent recall of having ever been told by a doctor that they have heart disease. There is no further clarification in the survey questionnaire as to what type of heart disease was diagnosed (angina, heart attack, etc.).

**Provenance**

The Australian Bureau of Statistics Australian Health Survey collects information about cardiovascular disease prevalence. Prevalence estimates for ischaemic heart disease are presented in reports profiling survey results, by age group and sex (ABS 2013).

**For more information**

Australian Government Department of Health, *What is cardiovascular disease?*

Department of Health, *Victorian Population Health Survey*

National Heart Foundation

World Health Organization
http://www.who.int/topics/cardiovascular_diseases/en/

Better Health Channel – Heart disease, risk factors

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Prevalence of diabetes

**Description**
The proportion of adults aged 18 years or older who have ever been diagnosed with diabetes by a doctor.

Diabetes mellitus is a common chronic condition characterised by high blood glucose (sugar) levels. The two main types of diabetes mellitus are type 1 (insulin-dependent) diabetes and type 2 diabetes. Gestational diabetes affects women when higher than normal blood glucose is diagnosed during pregnancy, although they have had no prior diagnosis of diabetes. This condition usually abates after birth but is a risk factor for mothers and babies developing type 2 diabetes later in life (AIHW 2014).

Type 1 diabetes is an autoimmune disease in which the body’s immune system destroys the insulin-producing cells of the pancreas, rendering the individual unable to produce enough of the hormone insulin, which is essential for the control of glucose levels in the blood. It usually has onset in childhood and adolescence but can be diagnosed at any age (Craig et al. 2011). People with type 1 diabetes require replacement insulin therapy for life. Type 1 diabetes accounts for approximately 10–15 per cent of diabetes mellitus (ABS 2013).

Type 2 diabetes is the most common form of diabetes accounting for around 85 per cent of all cases of diabetes mellitus (ABS 2013). Modifiable risk factors for type 2 diabetes include physical inactivity, poor diet, overweight/obesity, tobacco smoking, high blood pressure and high blood lipids (AIHW 2014). Type 2 diabetes is caused by insufficient production of insulin and/or the body becoming resistant to insulin being produced by the pancreas. In many cases, lifestyle modifications including appropriate diet and exercise can help control type 2 diabetes. More severe cases require treatment with blood glucose lowering medication, insulin injections, or a combination of these. Left untreated, diabetes mellitus can cause kidney disease, eye and nerve damage, heart disease, stroke, limb amputation and impotence.

The findings of the Australian Health Survey 2011–12 suggests that diabetes may be under diagnosed in Australia – for every four adults with diagnosed diabetes, there is estimated to be one with undiagnosed diabetes (ABS 2013). Thus prevalence of doctor-diagnosed diabetes may be an underestimate of the true prevalence. Further monitoring and surveillance of diabetes is crucial for guiding preventive measures, determining clinical care and informing health policy and service planning.

In 2011–12, the Victorian Population Health Survey reported the prevalence of doctor-diagnosed diabetes among people aged 18 years or older was 5.7 per cent (Department of Health 2014). Type 2 diabetes was the most commonly reported form of diabetes (5.0 per cent), followed by type 1 diabetes (0.6 per cent) (Figure 17). Gestational diabetes (2.0 per cent) was the second most commonly reported form of diabetes for women.
Figure 17: Prevalence of diabetes, by diabetes type and sex, Victoria, 2011–12

<table>
<thead>
<tr>
<th>Type 1 diabetes</th>
<th>Type 2 diabetes</th>
<th>Totala</th>
<th>Gestational only</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>95% CI</td>
<td></td>
<td>95% CI</td>
</tr>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>%</td>
<td>95% CI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.7</td>
<td>0.5</td>
<td>0.9</td>
<td>6.0</td>
</tr>
<tr>
<td>Females</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.6</td>
<td>0.4</td>
<td>0.8</td>
<td>4.1</td>
</tr>
<tr>
<td>Persons</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.6</td>
<td>0.5</td>
<td>0.8</td>
<td>5.0</td>
</tr>
</tbody>
</table>

a. Total excludes gestational diabetes.

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

Data are age-standardised to the 2011 Victorian population.

Source: Victorian Population Health Survey 2011–12

Although the prevalence of type 1 diabetes was similar between men (0.7 per cent) and women (0.6 per cent), the prevalence of type 2 diabetes was higher for men (6.0 per cent), compared with women (4.1 per cent) (Department of Health 2014).

The distribution in the prevalence of type 2 diabetes in the Victorian population by age, socioeconomic status and geographic location, along with changes in the prevalence of type 2 diabetes in Victoria between 2003 and 2011–12 are presented in the full report of the Victorian Population Health Survey 2011–12 (Department of Health 2014). The prevalence of type 2 diabetes has increased by about 50 per cent between 2003 and 2011–12 in both men and women (Department of Health 2014).
References


Concepts

Prevalence: The number of people with a disease or condition at a specific point in time.

Limitations

The prevalence rates are derived from survey data obtained through self-report and should be interpreted with caution. They rely on respondent recall of having ever been told by a doctor that they have diabetes. The data do not include undiagnosed cases in the community.

Provenance

Diabetes prevalence is regularly reported by the Australian Bureau of Statistics and the Australian Institute of Health and Welfare.

For more information

Department of Health, Victorian Population Health Survey

Better Health Channel, Diabetes

Diabetes Australia, What is diabetes?

World Health Organization, Diabetes programme
http://www.who.int/diabetes/en/

Contact

Loretta Vaughan
Health Intelligence Unit, System Intelligence and Analytics
Portfolio Strategy and Reform Division
Department of Health and Human Services

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Oral health status

Description
There are two measures included in this indicator:

1. Adults: The proportion of adults aged 18 years or older with excellent, very good, good, fair or poor oral health, by age group
2. Children: Standardised hospital admission rates (per 1,000 people) for dental ambulatory care sensitive conditions (ACSC) for children aged 0–9 years

Oral health is an integral aspect of general health. Poor oral health is likely to exist when general health is poor and vice versa (National Advisory Committee on Oral Health 2004). Good oral health allows people to eat, speak, smile and socialise without pain, discomfort or embarrassment. Tooth decay is the most prevalent health problem with more than half of all children (AIHW 2014a) and over 90 per cent of adults affected (AIHW 2008). Almost a quarter (24 per cent) of Victorian adults have untreated tooth decay (AIHW 2008). Moderate or severe gum disease affects over a third (35 per cent) of Victorian concession card holders and almost a quarter (24 per cent) of non-card holders (AIHW 2008). The prevalence increases to 58 per cent among those 55 years or older (AIHW 2008). Oral conditions are the second most expensive disease group to treat, just below cardiovascular disease (AIHW 2014b). A total of $2.7 billion was spent on dental treatment in Victoria in 2012–13 (AIHW 2014). In Victoria, oral cancer is the seventh most common cancer in men and the 12th most common cancer in women (Department of Health 2013).

The majority of Victorians enjoy good oral health, but there is a significant minority who are burdened by oral disease. Oral disease is a key marker of disadvantage, with greater levels of oral disease experienced by people on low incomes, dependent older people, Aboriginal and Torres Strait Islander peoples, rural dwellers, people with a disability, and immigrant groups from culturally and linguistically diverse backgrounds, particularly refugees (AIHW 2014c).

Dental conditions are the highest cause of all potentially preventable hospitalisations or an ambulatory care sensitive condition (ACSC) for Victorians under 25 years of age and the second highest for all ages (Department of Health and Human Services 2015). The predominant cause of dental ACSC in children is tooth decay (Department of Human Services 2007). Tooth decay is amenable to prevention by addressing the upstream socioeconomic determinants and the downstream factors of good nutrition (especially limiting consumption of sugary drinks), exposure to fluoride (such as in water and toothpastes), maintenance of adequate oral hygiene and access to regular preventively focused dental visits. The ability of families to follow these practices can be linked to their socioeconomic status.
Children are hospitalised for a dental condition, with dental treatment provided under a general anaesthetic, because of:

- the condition being considered too severe to be managed in a dental clinic
- behavioural problems of the child, or
- medical/physical complications.

Children may also be hospitalised for dental care because it is the preferred approach for the dentist or paediatric dental specialist, and the parents, compared with a series of dental clinic visits (Jamieson & Roberts-Thomson 2006).

The Victorian Population Health Survey 2011–12 found that the majority of Victorian adults rated their oral health as excellent (15.9 per cent), very good (27.4 per cent) or good (31.7 per cent). Approximately one quarter of Victorian adults rated their oral health as fair (13.5 per cent) or poor (5.7 per cent), or reported having no natural teeth (5.6 per cent) (data not shown, refer to Department of Health 2014). A lower proportion of men rated their dental health as excellent and men were also more likely to report fair or poor self-rated oral health, compared with their female counterparts. Fewer people aged 65 years or older rated their dental health as excellent, very good or good compared with all Victorian adults. More than 40 per cent of people in this age group reported fair or poor self-rated dental health, or that they had no natural teeth (Figure 18).

The Victorian Population Health Survey 2011–12 also explores in more detail the factors associated with poorer oral health in Victoria. The key factors are gender, age, socioeconomic status and geographic location. The Victorian Population Health Survey 2011–12 found that self-rated dental health was similar between adults who lived in rural and metropolitan Victoria. However, a significantly higher proportion of adults in rural Victoria did not have any natural teeth compared with their metropolitan counterparts. Close to a quarter of Victorian adults reported they had not visited a dentist in the two years preceding the survey. Men were less likely to have visited a dentist in the preceding two years compared with their female counterparts. Almost a third of adult Victorians reported that they had avoided or delayed a dental visit because of the cost. This was significantly higher in women than men (data not shown, refer to: Department of Health 2014).
Poor oral health is a high-burden condition for particular populations, with people living in regional areas, those on lower incomes and Aboriginal people experiencing the worst oral health (AIHW 2014c). Children from low socioeconomic areas experience up to 75 per cent more decay-affected teeth than children in the most advantaged areas (AIHW 2011).

Over the period 2005–06 to 2013–14, ACSC hospital admission rates for dental conditions, in children aged 0–4 years, have decreased (Figure 19). This may be because of an increase in the number of children receiving preventive oral health care.

Figure 18: Self-rated dental health status, by age group and sex, Victoria, 2011–12

Note that figures may not add up to 100 per cent due to a proportion of ‘don’t know’ or ‘refused’ responses.

Data are age-standardised to the 2011 Victorian population.

Source: Victorian Population Health Survey 2011–12
of preschool children accessing dental care and possibly a decrease in tooth decay rates. This
decrease appears to be greater in rural than in metropolitan areas, most likely due to the extension
of community water fluoridation. While admission rates are still higher in rural areas than metropolitan
areas, the gap appears to be narrowing over time. The remaining gap is likely to be due to not all
rural children having access to optimally fluoridated water and the relatively lower socioeconomic
status of rural families (Department of Human Services 2007, Rogers & Morgan 2010).

Figure 19: Standardised hospital admission rates (per 1,000 people) for dental conditions
for children aged 0–4 years, Victoria 2005–06 to 2013–14

<table>
<thead>
<tr>
<th>Year</th>
<th>Victoria</th>
<th>Metropolitan</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>95% CI</td>
<td>95% CI</td>
<td>95% CI</td>
</tr>
<tr>
<td>2005–06</td>
<td>7.0 6.7 7.3</td>
<td>5.3 5.0 5.6</td>
<td>11.6 10.8 12.3</td>
</tr>
<tr>
<td>2006–07</td>
<td>5.4 5.2 5.7</td>
<td>3.9 3.6 4.2</td>
<td>9.6 8.9 10.3</td>
</tr>
<tr>
<td>2007–08</td>
<td>5.2 5.0 5.5</td>
<td>3.7 3.5 4.0</td>
<td>9.4 8.8 10.1</td>
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<tr>
<td>2008–09</td>
<td>4.8 4.5 5.0</td>
<td>3.8 3.5 4.0</td>
<td>7.6 7.0 8.2</td>
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<td>2009–10</td>
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<td>3.8 3.5 4.0</td>
<td>7.5 7.0 8.1</td>
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<td>2012–13</td>
<td>3.8 3.6 4.0</td>
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<tr>
<td>2013–14</td>
<td>3.9 3.7 4.1</td>
<td>3.3 3.1 3.6</td>
<td>5.4 4.9 5.9</td>
</tr>
</tbody>
</table>

a. per 1,000 population
LL/UL 95% CI = lower/upper limit of 95 per cent confidence interval
Standardised to 2011 Victorian population
Source: Victorian Admitted Episodes Dataset 2005–2014
Dental ACSC hospital admission rates in children aged 5–9 years have not changed significantly between 2005–06 and 2013–14 (Figure 20). Admission rates have remained higher in rural areas compared with metropolitan areas over this period. The impact of community water fluoridation extension, particularly from 2006, and the increase in preschool children accessing dental care may be offset by an increased use of the model of care that preferences dental hospitalisation over treatment in a dental clinic.

Figure 20: Standardised hospital admission rates (per 1,000 people) for dental conditions for children aged 5–9 years, Victoria 2005–06 to 2010–11

<table>
<thead>
<tr>
<th>Year</th>
<th>Victoria Ratea</th>
<th>95% CI</th>
<th>Metropolitan Ratea</th>
<th>95% CI</th>
<th>Rural Ratea</th>
<th>95% CI</th>
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<tr>
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<td>7.9–8.5</td>
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<td>6.0–6.7</td>
<td>12.4</td>
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<td>2006–07</td>
<td>7.9</td>
<td>7.6–8.2</td>
<td>5.8</td>
<td>5.5–6.1</td>
<td>13.2</td>
<td>12.4–13.9</td>
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<td>2007–08</td>
<td>8.5</td>
<td>8.2–8.8</td>
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<td>6.2–6.9</td>
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<td>2008–09</td>
<td>8.9</td>
<td>8.6–9.3</td>
<td>6.7</td>
<td>6.4–7.0</td>
<td>14.5</td>
<td>13.7–15.3</td>
</tr>
<tr>
<td>2009–10</td>
<td>9.4</td>
<td>9.0–9.7</td>
<td>7.5</td>
<td>7.2–7.9</td>
<td>14.0</td>
<td>13.3–14.8</td>
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<tr>
<td>2010–11</td>
<td>8.9</td>
<td>8.6–9.2</td>
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<td>12.8</td>
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</tr>
<tr>
<td>2011–12</td>
<td>8.7</td>
<td>8.4–9.0</td>
<td>7.0</td>
<td>6.7–7.4</td>
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<td>12.4–13.9</td>
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<td>2012–13</td>
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<td>2013–14</td>
<td>7.9</td>
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<td>10.8–12.2</td>
</tr>
</tbody>
</table>

a. per 1,000 population
LL/UL 95% CI = lower/upper limit of 95 per cent confidence interval
Standardised to 2011 Victorian population
Source: Victorian Admitted Episodes Dataset 2005–2014
References


Rogers J, Morgan M 2010, ‘Changes in preventable dental hospitalisation of children by socioeconomic status’, *Journal of Dental Research*, vol. 91, Special Issue B.


Concepts

Self-rated dental health: For the first time, questions were included in the Victorian Population Health Survey to measure self-rated oral health (Respondents were asked ‘How would you rate your dental health?’), the period of time since the last visit to a dental professional, and avoidance or delaying a dental visit because of cost. Analyses of the answers to these questions will assist in identifying which Victorians are at higher risk of poorer oral health and what can be done to address this. Inclusion of these questions in future Victorian Population Health Surveys will allow monitoring of trends and the impact of oral health promotion interventions.
Ambulatory care sensitive conditions (ACSCs): Conditions for which hospitalisation is considered to be avoidable through prevention and early disease management, usually delivered in an ambulatory care setting. Dental ACSCs do not include hospitalisation for conditions that are not preventable, such as disorders of tooth development and the extraction of impacted teeth.

Provenance
The National Survey of Adult Oral Health (NSAOH) 2004–06 includes similar questions to the Victorian Population Health Survey (AIHW 2008; Slade et al. 2007), however the NSAOH surveyed a nationally representative sample of Australians aged 15 or over.

The child oral health data presented are based on analysis of ambulatory care sensitive conditions (ACSCs) from the Victorian Admitted Episodes Dataset. Further information is available at: https://www2.health.vic.gov.au/public-health/population-health-systems/health-status-of-victorians

For more information


Contact
Dental Health Program
Screening and Preventive Health Programs
Prevention, Population, Primary and Community Health
Department of Health and Human Services

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Injury and poisoning hospital admissions

Description

The number and rate of admissions (hospitalisations) to public and private hospitals in Victoria due to all causes of injury and poisoning

Injury has a major impact on health, causing death or resulting in serious disability or long-term conditions (AIHW 2012). As injury is largely preventable, indicators provide information to monitor the progress of efforts to reduce injury. The combined ‘All injury and poisoning hospitalisations’ indicator includes injury and poisoning hospitalisations from all causes (both unintentional and intentional), all activities, in all locations and for all ages. The indicator excludes injury and poisoning hospitalisations of non-Victorian residents, deaths and transfers within and between hospitals and readmissions to the same hospital within 30 days.

The number and rates of injury and poisoning hospital admissions are shown for all injury and poisoning causes, including and excluding same-day admissions (Figures 21 and 22). Exclusion of same-day admissions data from the analysis produces a more stable indicator of trend, as this data is subject to variation that reflects admission policy changes across time and between hospitals, rather than the actual experience of significant injury in a population (VISU 2014).

Hospital admissions due to medical injury have previously been reported as a sub-category of admissions as part of this indicator. To better align with reporting conventions for injury and poisonings admissions, they have been not been presented in the current report. Although this category is an important type of potentially preventable harm and can reflect the quality of healthcare provided to a population, it should be noted that the overall number and rate of medical injury hospitalisations can be difficult to interpret as these include a mix of causes, from those that carry little significance for medium to longer term health (such as a short-lived drug rash) to those with a considerable contribution to morbidity.

Falls account for about half of injury and poisoning hospital admissions.
Figure 21: Number of injury and poisoning hospital admissions, Victoria, 1998–99 to 2012–13

Source: Victorian Injury Surveillance Unit (VISU): Victorian Admitted Episodes Dataset (VAED) July 1998 to June 2013. Note: In July 2012 the Victorian hospital admission policy changed significantly so that episodes of care delivered entirely within a designated emergency department or urgent care centre could no longer be categorised as an admission, regardless of the amount of time spent in the hospital. This has had the effect of reducing the number of admissions recorded on the VAED for the 2012–13 financial year. For this reason caution should be exercised when interpreting potential changes in the number of hospital admissions in 2012–13 compared with previous years (see ‘Limitations’ at the end of this section).
Figure 22: Injury and poisoning hospital admission rates\textsuperscript{a} for all causes, Victoria, 1998–99 to 2012–13

![Graph showing injury and poisoning hospital admission rates for all causes, Victoria, 1998–99 to 2012–13. The graph includes two lines: one for all causes (including same-day admissions) and another for all causes (excluding same-day admissions). The rates are age-standardised to the 2001 Victorian population.]

\textsuperscript{a} Rates are age-standardised to the 2001 Victorian population.

Source: Victorian Injury Surveillance Unit (VISU); Victorian Admitted Episodes Dataset (VAED) July 1998 to June 2013.

Note: In July 2012 the Victorian hospital admission policy changed significantly so that episodes of care delivered entirely within a designated emergency department or urgent care centre could no longer be categorised as an admission, regardless of the amount of time spent in the hospital. This has had the effect of reducing the number of admissions recorded on the VAED for the 2012–13 financial year. For this reason caution should be exercised when interpreting potential changes in the number of hospital admissions in 2012–13 compared with previous years (see ‘Limitations’).
In 2012–13 there were more than 2.4 million hospital admissions in Victoria. Of these 95,377 were admissions due to injury and poisoning (including same-day admissions); of these, 69,167 were non-same-day cases (Table 8). Age-standardised admission rates were 1,610.3 (including same-day admissions) and 1,154.8 (excluding same-day admissions) per 100,000 people.

Table 8: Number and ratea of injury and poisoning hospital admission for all causes, Victoria, 1998–99 to 2012–13

<table>
<thead>
<tr>
<th>Year of admission</th>
<th>All injury and poisoning (including same-day admissions)</th>
<th>All injury and poisoning (excluding same-day admissions)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Ratea</td>
</tr>
<tr>
<td>1998–99</td>
<td>70,001</td>
<td>1,513.8</td>
</tr>
<tr>
<td>1999–00</td>
<td>73,784</td>
<td>1,574.5</td>
</tr>
<tr>
<td>2000–01</td>
<td>79,591</td>
<td>1,672.1</td>
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<tr>
<td>2001–02</td>
<td>82,459</td>
<td>1,721.2</td>
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<tr>
<td>2002–03</td>
<td>84,939</td>
<td>1,748.9</td>
</tr>
<tr>
<td>2003–04</td>
<td>82,524</td>
<td>1,676.0</td>
</tr>
<tr>
<td>2004–05</td>
<td>88,554</td>
<td>1,772.4</td>
</tr>
<tr>
<td>2005–06</td>
<td>91,366</td>
<td>1,797.3</td>
</tr>
<tr>
<td>2006–07</td>
<td>97,174</td>
<td>1,872.9</td>
</tr>
<tr>
<td>2007–08</td>
<td>99,308</td>
<td>1,871.6</td>
</tr>
<tr>
<td>2008–09</td>
<td>101,071</td>
<td>1,860.1</td>
</tr>
<tr>
<td>2009–10</td>
<td>102,646</td>
<td>1,847.7</td>
</tr>
<tr>
<td>2010–11</td>
<td>113,010</td>
<td>1,994.9</td>
</tr>
<tr>
<td>2011–12</td>
<td>119,224</td>
<td>2,069.5</td>
</tr>
<tr>
<td>2012–13</td>
<td>95,377</td>
<td>1,610.3</td>
</tr>
</tbody>
</table>

a. Rates are age-standardised to the 2001 Victorian population.

Source: Victorian Injury Surveillance Unit (VISU); Victorian Admitted Episodes Dataset (VAED) July 1998 to June 2013

Note: In July 2012 the Victorian hospital admission policy changed significantly so that episodes of care delivered entirely within a designated emergency department or urgent care centre could no longer be categorised as an admission regardless of the amount of time spent in the hospital. This has had the effect of reducing the number of admissions recorded on the VAED for the 2012–13 financial year. For this reason caution should be exercised when interpreting potential changes in the number of hospital admissions in 2012–13 compared with previous years (see ‘Limitations’).

Males accounted for 51 per cent (n = 35,502) of all injury and poisoning hospital admissions (excluding same-day admissions) in 2012–13.

The five leading causes of injury and poisoning admissions in 2012–13 were falls (47 per cent, n = 32,246), transport (12 per cent, n = 8,341), unspecified unintentional (10 per cent, n = 7,224), hitting/striking/crushing incidents (five per cent, n = 3,573) and self-harm (five per cent, n = 3,549).
The number of injury and poisoning admissions (excluding same-day admissions) in Victoria has increased significantly over the 15-year period from 47,202 in 1998–99 to 69,167 in 2012–13. This represents an estimated annual change of 3.1 per cent (95% CI: 2.7–3.3) and an overall increase of 57.5 per cent (95% CI: 49.4–63.9).

In July 2012 the Victorian hospital admission policy changed significantly so that episodes of care delivered entirely within a designated emergency department or urgent care centre could no longer be categorised as an admission, regardless of the amount of time spent in the hospital. This has had the effect of reducing the number of admissions recorded for the 2012–13 financial year and the subsequent calculated rate of admissions, as reflected in the graphs on the preceding pages.

The age-standardised injury and poisoning admission rate (excluding same-day admissions) increased significantly over the 15-year period from 1,026.7 per 100,000 people in 1998–99 to 1,154.8 per 100,000 people in 2012–13. This represents an estimated annual change of 1.1 per cent (95% CI: 0.8–1.4) and an overall increase of 17.9 per cent (95% CI: 13.0–22.9).

This increase in admissions appears to be due to a significant increase in unintentional injury and poisoning admission rates among adults aged 25 or older, as unintentional injury and poisoning admission rates were stable in children, adolescents and young adults under 25 years of age over this period (VISU 2014). The cause of the increase in injury and poisoning admissions in this group is not fully understood and requires further investigation.

In addition, often an individual will present to a hospital emergency department (ED) for treatment for an unintentional injury or poisonings; however, this may not result in a hospital admission. In 2012–13 there were 291,399 non-admitted ED presentations (5,223.0 per 100,000 people) for all cause (intentional and unintentional) injury and poisoning (data not shown; data provided by VISU). The number and rate of ED presentations in 2012–13 have increased by 27.3 per cent and 10.3 per cent, respectively, when compared with 2004–05.

Further detail of unintentional injury and poisoning admissions and ED presentations rates and trends, including cause, type and setting of injury, by age group and gender, are presented in the report Unintentional (accidental) hospital-treated injury Victoria 2012/13 (VISU 2014). Specific analysis of unintentional injury-related hip fracture hospital admissions among people aged 75 years or older and mortality due to intentional self-harm injury are presented elsewhere in this report.

References


Concepts

Data selection: The operational definition of a primary injury or poisoning diagnosis is an ICD-10 (International Classification of Diseases – 10th revision) code in the range S00–T89. Non-Victorian residents, deaths and transfers within and between hospitals, readmissions within 30 days and injuries due to medical causes (those with an ICD-10 cause code in the range Y40–Y84) were excluded.

Coding allows for the designation of the cause of injury, the place of occurrence, the activity when injured, human intent (unintentional; intentional-assault, neglect, self-harm; undetermined intent), the body region injured, the nature of the main injury and co-occurrence of the injury with other diseases and conditions that can happen by chance or because there is some association between them (comorbidities).

Only non-same-day admissions have been included in the trend analysis. Therefore, this data does not include instances where an individual is treated and discharged from an ED within four hours from the time patient management commences (‘non-admissions’) or cases that are defined as ‘admissions’ because they are treated for four hours or more in the ED or a short stay ward attached to the ED or depart from the ED to an inpatient bed or are transferred to another hospital campus but where there is no admission for more than 24 hours. Please see ‘Limitations’ below and the notes under the figures and table for information regarding a change in admission policy in the 2012–13 year.

Injury: Defined as tissue damage resulting from either the acute transfer to individuals of the five forms of physical energy (kinetic or mechanical, thermal, chemical, electrical or radiation) or from the sudden interruption of normal energy patterns to maintain life patterns (Waller 1985).

Injuries resulting from medical injury causes are defined as including: drugs, medicaments and biological substances causing adverse effects in therapeutic use (an ICD-10 cause code in the range Y40–Y59); misadventures to patients during surgical and medical care (Y60–Y69); medical devices associated with misadventures in diagnostic and therapeutic use (Y70–Y82); and surgical and other medical procedures as the cause of abnormal reaction of the patient, or of later complication, without mention of misadventure at the time of the procedure (Y83–Y84). They do not include complications of surgical and medical care not elsewhere classified (T80–T89).

Same-day admissions: Defined as those discharged on the day of admission (other than those ending in transfer to another hospital).

Emergency department (ED) presentations: An injury or poisoning that results in a person presenting to a hospital ED for treatment who is triaged (assessed for urgency), including those patients who leave before treatment commences. A ‘non-admission’ is a person who
is discharged from the ED within four hours of the time patient management commenced or whose entire treatment occurs within the ED. ED presentations in this indicator include individuals who subsequently were admitted to hospital. Data for ED presentations are extracted from the Victorian Emergency Minimum Dataset (VEMD).

Limitations
In July 2012 the Victorian hospital admission policy changed significantly so that episodes of care delivered entirely within a designated ED or urgent care centre could no longer be categorised as an admission, regardless of the amount of time spent in the hospital. Previously, these types of episodes could be categorised as an admission if the length of time in the hospital was four hours or more. This has had the effect of reducing the number of admissions recorded on the VAED for the 2012–13 financial year. For this reason VISU suggests caution should be exercised when interpreting potential changes in the number of hospital admissions in 2012–13 compared with previous years. Trend analysis for this indicator is only calculated for hospital admissions that separate on a date after the admission date (non-same-day admissions) as these admissions are less likely to be influenced by the change in admission policy.

In selecting injury indicators, the definitions and validation tool developed by the International Collaborative Effort on Injury Statistics Indicators Group (Cryer et al. 2005) and the Injury Prevention Research Unit, University of Otago, New Zealand (Cryer, Langley & Stephenson 2004) were utilised, with some adjustments. The extensive technical review of the injury indicators included in the Injury Prevention and Control National Health Priority Areas Program also informed the approach (Harrison & Steenkamp 2002).

Provenance
This indicator is a Victorian adaptation of an indicator used in the Australian Institute of Health and Welfare review of National Health Priority Area injury indicators and data sources.

For more information
World Health Organization International Classification of Diseases (ICD)
http://www.who.int/classifications/icd/en/
http://apps.who.int/classifications/icd10/browse/2010/en

Victorian Injury Surveillance Unit, Unintentional (accidental) hospital-treated injury Victoria 2012/13

Contact
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Telephone: (03) 9905 1805
Email: visu.enquire@monash.edu
Human function

Human function measures alterations to body, structure or function (impairment), activity limitations and restrictions in participation. More specifically, this dimension captures information on the prevalence of disability and impairment in the population. The indicators of human function presented in this section of the report include the following.

**Congenital anomalies:** The total number of congenital anomalies for a specific time period, expressed as a rate per 10,000 pregnancies, over the same time period.

**Low birth weight:** The number of births where the birth weight was less than 2,500 grams (‘low birth weight’) or less than 1,500 grams (‘very low birth weight’), expressed as a percentage of all live births.

**Prevalence of stroke:** The proportion of adults aged 18 years or older who have ever been diagnosed with stroke by a doctor.

**Unintentional hip fracture admissions (people aged 75 years or older):** The number and rate of admissions to public and private hospitals in Victoria due to unintentional (‘accidental’) injury-related hip fracture among people aged 75 years or older, including same-day admissions.
A congenital anomaly is any abnormality of prenatal origin, either present following conception or occurring before the end of pregnancy. This includes structural, functional, genetic, chromosomal and biochemical abnormalities. The most common congenital anomalies are Down syndrome, heart defects or congenital dislocated hips (DEECD 2011). Congenital anomalies are a major cause of morbidity and mortality, representing the leading cause of death in post-neonatal infants (CCOPMM 2012a) and can be a major reason for hospitalisation or medical treatment during infancy and childhood (DEECD 2011). They can be detected at, or before, birth; however, some conditions may manifest later in life (AIHW 2009). Some anomalies are the result of teratogenic effects and may therefore be preventable, while the causes of other defects remain less clearly understood.

The monitoring of congenital anomalies helps to inform health service planning, performance and the impact of preventive strategies. In Victoria, cases of suspected or proven congenital anomalies are notified to the Victorian Congenital Anomalies Register, which is maintained by the Victorian Government Department of Health and Human Services on behalf of the Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM).

In 2009 there were 3,078 babies born with congenital anomalies, including those identified as terminations of pregnancy before 20 weeks’ gestation (Table 9). The majority of congenital anomaly cases occurred in babies who were liveborn and survived the neonatal period ($n = 2,390$). This gives an overall birth defect prevalence rate of 418/10,000 or 4.2 per cent.

There were 414 pregnancies with congenital anomalies that were terminated before 20 weeks’ gestation, and another 196 pregnancies with congenital anomalies that were terminated at 20 weeks or later. Of babies with a congenital anomaly born at 20 weeks or later, excluding terminations, 32 were stillborn and 46 were neonatal deaths (Table 9).

The number of congenital anomalies for the 2008 and 2009 birth cohorts may increase in future reporting as anomalies diagnosed in early childhood, rather than at birth, continue to be notified. These notifications will subsequently be attributed to the child’s year of birth.
Table 9: Prevalence and outcome of congenital anomalies, Victoria, by birth cohort year, 1997–2009

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</thead>
<tbody>
<tr>
<td><strong>Total number congenital anomaly cases (including malformations before 20 weeks termination)</strong></td>
<td>2,641</td>
<td>2,647</td>
<td>2,904</td>
<td>2,945</td>
<td>2,700</td>
<td>2,875</td>
<td>3,002</td>
<td>3,052</td>
<td>2,751</td>
<td>3,014</td>
<td>3,816</td>
<td>2,990</td>
<td>3,078</td>
</tr>
<tr>
<td><strong>Total number births (including terminations &lt; 20 weeks for a congenital anomaly)</strong></td>
<td>62,606</td>
<td>62,367</td>
<td>62,985</td>
<td>62,448</td>
<td>63,372</td>
<td>63,890</td>
<td>64,037</td>
<td>66,992</td>
<td>70,217</td>
<td>72,839</td>
<td>72,905</td>
<td>73,678</td>
<td></td>
</tr>
<tr>
<td><strong>Congenital anomaly rate (n/10,000 pregnancies)</strong></td>
<td>421.8</td>
<td>424.4</td>
<td>461.1</td>
<td>468.6</td>
<td>432.4</td>
<td>453.7</td>
<td>469.9</td>
<td>476.6</td>
<td>410.6</td>
<td>429.2</td>
<td>523.9</td>
<td>410.1</td>
<td>417.8</td>
</tr>
<tr>
<td><strong>Number births</strong></td>
<td>62,308</td>
<td>62,091</td>
<td>62,689</td>
<td>62,564</td>
<td>62,148</td>
<td>63,072</td>
<td>63,551</td>
<td>63,700</td>
<td>66,654</td>
<td>69,856</td>
<td>72,474</td>
<td>72,545</td>
<td>73,264</td>
</tr>
</tbody>
</table>

**Outcome (n)**

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</thead>
<tbody>
<tr>
<td>Survived &gt; 28 days</td>
<td>2,140</td>
<td>2,192</td>
<td>2,387</td>
<td>2,471</td>
<td>2,202</td>
<td>2,351</td>
<td>2,443</td>
<td>2,498</td>
<td>2,206</td>
<td>2,420</td>
<td>3,193</td>
<td>2,421</td>
<td>2,390</td>
</tr>
<tr>
<td>Liveborn, neonatal death</td>
<td>83</td>
<td>69</td>
<td>92</td>
<td>50</td>
<td>60</td>
<td>56</td>
<td>50</td>
<td>48</td>
<td>42</td>
<td>53</td>
<td>34</td>
<td>39</td>
<td>46</td>
</tr>
<tr>
<td>Stillborn</td>
<td>42</td>
<td>29</td>
<td>29</td>
<td>29</td>
<td>28</td>
<td>29</td>
<td>28</td>
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<td>30</td>
<td>32</td>
<td>33</td>
<td>20</td>
<td>32</td>
</tr>
<tr>
<td>Termination ≥ 20 weeks</td>
<td>78</td>
<td>82</td>
<td>101</td>
<td>103</td>
<td>103</td>
<td>112</td>
<td>125</td>
<td>133</td>
<td>135</td>
<td>149</td>
<td>191</td>
<td>150</td>
<td>196</td>
</tr>
<tr>
<td>Termination &lt; 20 weeks</td>
<td>298</td>
<td>275</td>
<td>295</td>
<td>292</td>
<td>307</td>
<td>327</td>
<td>356</td>
<td>342</td>
<td>338</td>
<td>360</td>
<td>365</td>
<td>360</td>
<td>414</td>
</tr>
<tr>
<td><strong>Total number congenital anomaly cases</strong></td>
<td>2,641</td>
<td>2,647</td>
<td>2,904</td>
<td>2,945</td>
<td>2,700</td>
<td>2,875</td>
<td>3,002</td>
<td>3,052</td>
<td>2,751</td>
<td>3,014</td>
<td>3,816</td>
<td>2,990</td>
<td>3,078</td>
</tr>
</tbody>
</table>

*The indicator includes all congenital anomalies for livebirths, stillbirths and terminations of pregnancy at all gestations, irrespective of age at diagnosis, by birth cohort year.

Source: CCOPMM 2012b*
Figure 23 shows birth outcomes in Victoria from 1997 to 2009.

**Figure 23: Birth outcome per 10,000 pregnancies, Victoria, by birth cohort year, 1997–2009**

Source: Consultative Council on Obstetric and Paediatric Mortality and Morbidity, 2012b

**References**


Concepts

Live birth: The complete expulsion or extraction from its mother of a baby of at least 20 weeks’ gestation or, if gestation is unknown, weighing at least 400 g who, after being born, breathes or shows any evidence of life such as a heartbeat.

Neonatal death: Refers to a death occurring within 28 days of live birth in an infant whose gestation was at least 20 weeks or, if gestation is unknown, weighing at least 400 g.

Perinatal death: A stillbirth or neonatal death.

Stillbirth: The complete expulsion or extraction from its mother of a baby of at least 20 weeks’ gestation or, if the gestation is unknown, weighing at least 400 g who did not, at any time after delivery, breathe or show any evidence of life such as a heartbeat.

Congenital anomaly cases: Refers to the number of liveborn or stillborn infants, or terminations at any gestation affected by at least one congenital anomaly.

Limitations

All notifications of congenital anomalies (excluding terminations of pregnancy before 20 weeks’ gestation and interstate births) are linked to the perinatal birth form to obtain an obstetric history for each case. Midwives complete this form as part of the mandatory notification system to the Victorian Perinatal Data Collection for every birth in Victoria.

Over the years, the data quality of the Victorian Congenital Anomalies Register has been assessed by validation studies. Ascertainment of all terminations is difficult. The most recent study noted further improvement in overall notification to 88 per cent (Riley & Halliday 2008).

Provenance

In Victoria, cases of suspected or proven birth defects are notified to the Victorian Congenital Anomalies Register, maintained by the Victorian Government Department of Health and Human Services.

For more information


Contact

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Health Service Programs Branch
Department of Health and Human Services
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Melbourne VIC 3001

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Email: perinatal.data@dhhs.vic.gov.au
Low birth weight

Description
The number of births where the birth weight was less than 2,500 g (‘low birth weight’) or less than 1,500 grams (‘very low birth weight’), expressed as a percentage of all births.

Low birth weight has been defined by the World Health Organization as weight at birth of less than 2,500 g (5.5 pounds) (United Nations Children’s Fund & WHO 2004). This is based on epidemiological observations that infants weighing less than 2,500 g are approximately 20 times more likely to die than heavier babies. The incidence of low birth weight is higher in the developing world compared with the developed world (United Nations Children’s Fund & WHO 2004). Low birth weight is an indicator of potential lifelong consequences to individuals, families and communities at large.

A baby’s low weight at birth is either the result of preterm birth (before 37 weeks’ gestation) or due to restricted fetal (intrauterine) growth. Low birth weight is a major determinant of mortality, morbidity and disability in infancy and childhood, and also has a long-term impact on health outcomes in adult life. Many factors affect the duration of gestation and foetal growth, and may relate to the infant, the mother or the physical environment. These factors play an important role in determining the birth weight and the future health of an infant.

Mothers in deprived socioeconomic conditions frequently have low birth weight infants. In those settings, low birth weight stems primarily from the mother’s poor nutrition and health over a long period of time, including during pregnancy, the high prevalence of specific and non-specific infections, or from pregnancy complications, underpinned by poverty. Physically demanding work during pregnancy also contributes to poor fetal growth (United Nations Children’s Fund & WHO 2004).

There was little change in the proportion of babies with low birth weight and very low birth weight over the period 2000 to 2011 (Figure 24).
Babies born to Aboriginal mothers were nearly twice as likely as others to have low birth weight (< 2,500 g) or very low birth weight (< 1,500 g) (11.1 per cent and 2.0 per cent respectively in 2011), but the Aboriginal rate of low and very low birth weight was slightly lower in 2011 than in 2009 (CCOPMM 2014).

**References**


**Concepts**

Low birth weight: A weight of less than 2,500 grams (up to and including 2,499 grams), irrespective of gestational age. Those weighing less than 1,500 grams are defined as very low birth weight and those less than 1,000 g as extremely low birth weight.

Aboriginal status: In accordance with The health and wellbeing of Aboriginal Victorians: Victorian Population Health Survey 2008 supplementary report the term ‘Aboriginal’ is taken to include both Aboriginal and Torres Strait Islander people.

**Limitations**

Births include all births of babies at 20 or more weeks’ gestation (or weighing at least 400 g) but exclude late terminations of pregnancy (≥ 20 weeks). As a result, the data presented here will differ slightly from those presented in reports by the National Perinatal Statistics Unit, which includes these cases.

**Provenance**

Low birth weight prevalence is reported by the Department of Reproductive Health and Research, World Health Organization.

**For more information**

United Nations Children’s Fund & World Health Organization, Low birth weight: country, regional and global estimates

Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM)

**Contact**

Manager, Clinical Councils Unit
Health Service Programs Branch
Department of Health and Human Services
GPO Box 4003
Melbourne VIC 3001

Telephone: (03) 9096 2697
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Prevalence of stroke

Description
The proportion of adults aged 18 years or older who have ever been diagnosed with stroke by a doctor.

Stroke occurs when an artery supplying blood to the brain suddenly becomes blocked (ischaemic stroke) or bleeds (haemorrhagic stroke). Often this causes paralysis of parts of the body normally controlled by that area of the brain, or speech problems and other symptoms (AIHW 2014). Stroke is a major contributor to the burden of disease in Australia (IHME 2013). In many, but not all, cases stroke is preventable because many of its risk factors, including high blood pressure, physical inactivity, overweight or obesity and tobacco smoking, are modifiable (AIHW 2014). The prevalence of stroke provides insights into the level of resources required for prevention, health promotion and management of cardiovascular disease in the population (AIHW 2013).

The Victorian Population Health Survey 2011–12 found that 2.4 per cent of adult Victorians aged 18 years or older reported having ever been diagnosed with stroke by a doctor. The prevalence of stroke increased with age. Stroke was rarely reported in adults aged 18–44 years, while adults aged 65 years or older were more likely than those younger age groups to report having ever had a stroke. Overall, the prevalence of stroke was not different between the sexes. However, among adults aged 65 years or older there was a higher prevalence of stroke in men compared with women (Figure 25).

The Victorian Population Health Survey 2011–12 includes an analysis of the prevalence of stroke by region of residence and socioeconomic status (data not shown; refer to full report). Overall, no significant differences were identified in the prevalence of stroke in men or women who lived in rural compared with metropolitan Victoria. The prevalence of stroke significantly declined with increasing total household income.
## Figure 25: Prevalence of stroke, by sex and age group, Victoria, 2011–12

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Males 95% CI</th>
<th>Females 95% CI</th>
<th>Persons 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>LL</td>
<td>UL</td>
</tr>
<tr>
<td>18–24</td>
<td>**</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>25–34</td>
<td>**</td>
<td>1.0*</td>
<td>0.5</td>
</tr>
<tr>
<td>35–44</td>
<td>0.8*</td>
<td>0.4</td>
<td>1.7</td>
</tr>
<tr>
<td>45–54</td>
<td>1.1</td>
<td>0.7</td>
<td>1.8</td>
</tr>
<tr>
<td>55–64</td>
<td>3.3</td>
<td>2.5</td>
<td>4.3</td>
</tr>
<tr>
<td>65+</td>
<td>8.6</td>
<td>7.5</td>
<td>9.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2.6</td>
<td>2.3</td>
<td>2.9</td>
</tr>
</tbody>
</table>

Data are crude estimates, except for the totals, which represent the estimate for Victoria and have been age-standardised to the 2011 Victorian population.

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

* Estimate has a relative standard error (RSE) of between 25 and 50 per cent and should be interpreted with caution.

** Estimate has an RSE greater than 50 per cent and is not reported as it is unreliable for general use.

Source: Victorian Population Health Survey 2011–12

### References


Concepts

Prevalence: The number of people with a disease at a specific point in time.

Limitations

The stroke prevalence rates are derived from survey data obtained through self-report and should be interpreted with caution. They rely on respondent recall of having ever been told by a doctor that they have had a cerebrovascular event or stroke.

Provenance

The Australian Bureau of Statistics Australian Health Survey collects information about cardiovascular disease prevalence. Prevalence estimates for cerebrovascular disease are presented in reports profiling survey results, by age group and sex (ABS 2013).

For more information

Australian Bureau of Statistics, Australian Health Survey 2011–13

Department of Health, Victorian Population Health Survey

National Stroke Foundation

Better Health Channel – Stroke

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Unintentional injury-related hip fracture hospital admissions among people aged 75 years or older

Description
The number and rate of admissions to public and private hospitals in Victoria due to unintentional (‘accidental’) injury-related hip fracture among people aged 75 years or older.

Among older people, the number of hospitalisations per year due to injuries from falls is large and is increasing as the Victorian population ages. The rate of fall-related injury hospitalisations is particularly high among people aged 75 years or older. Older women are at greater risk of hospitalisation for fall-related injury than men in the same age group, but the gap narrows as age increases. Hip fractures are a relatively common fracture associated with a fall incident. They represent a substantial proportion of the burden of disease and health expenditure for older people in the population.

Figures 26 and 27 show the number and rates of unintentional hip fracture hospital admissions including and excluding same-day admissions. Exclusion of same-day admissions data from the analysis produces a more stable indicator of trend, as this data is subject to variation that reflects admission policy changes across time and between hospitals, rather than the actual experience of significant injury in a population (VISU 2014). In July 2012 the Victorian hospital admission policy changed significantly so that episodes of care delivered entirely within a designated emergency department or urgent care centre could no longer be categorised as an admission, regardless of the amount of time spent in the hospital. This has had the effect of reducing the number of admissions recorded on the VAED for the 2012–13 financial year (see ‘Limitations’ at the end of this section).

The number of hospital admissions for hip fractures in older Victorians increased by 16 per cent in 14 years.
Figure 26: Number of unintentional injury-related hip fracture hospital admissions, Victoria, 1998–99 to 2012–13

Source: Victorian Injury Surveillance Unit (VISU); Victorian Admitted Episodes Dataset (VAED) July 1998 to June 2013

Note: In July 2012 the Victorian hospital admission policy changed significantly so that episodes of care delivered entirely within a designated emergency department or urgent care centre could no longer be categorised as an admission regardless of the amount of time spent in the hospital. This has had the effect of reducing the number of admissions recorded on the VAED for the 2012–13 financial year. For this reason caution should be exercised when interpreting potential changes in the number of hospital admissions in 2012–13 compared with previous years (see ‘Limitations’).
In 2012–13, 3,487 Victorians aged 75 years or older were admitted to hospital with unintentional ('accidental') injury-related hip fracture (including same-day admissions), an age-standardised admission rate of 843.0 per 100,000 people (Table 10). When same-day admissions were excluded there were 3,375 admissions, an age-standardised admission rate of 815.3 per 100,000 people.

Women accounted for 74 per cent \( (n = 2,578) \) of all unintentional injury-related hip fracture hospital admissions in 2012–13. The leading cause of these injuries in people aged 75 years or older in 2012–13 was falls, accounting for 94 per cent of all hospital admissions \( (n = 3,274) \). Fall-related hip fractures were most commonly the result of same level slips, trips and stumbles (30 per cent of falls, \( n = 1,002 \)).
Table 10: Number and rate\(^a\) of unintentional injury-related hip fracture hospital admission among people aged 75 years or older, Victoria 1998–99 to 2012–13

<table>
<thead>
<tr>
<th>Year of admission</th>
<th>All unintentional hip fractures (including same-day admissions)</th>
<th>All unintentional hip fractures (excluding same-day admissions)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Rate(^a)</td>
</tr>
<tr>
<td>1998–99</td>
<td>3,036</td>
<td>1,181.9</td>
</tr>
<tr>
<td>1999–00</td>
<td>3,235</td>
<td>1,207.7</td>
</tr>
<tr>
<td>2000–01</td>
<td>3,401</td>
<td>1,212.0</td>
</tr>
<tr>
<td>2001–02</td>
<td>3,696</td>
<td>1,276.6</td>
</tr>
<tr>
<td>2002–03</td>
<td>3,527</td>
<td>1,183.0</td>
</tr>
<tr>
<td>2003–04</td>
<td>3,506</td>
<td>1,142.6</td>
</tr>
<tr>
<td>2004–05</td>
<td>3,497</td>
<td>1,101.9</td>
</tr>
<tr>
<td>2005–06</td>
<td>3,523</td>
<td>1,069.4</td>
</tr>
<tr>
<td>2006–07</td>
<td>3,506</td>
<td>1,025.9</td>
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<tr>
<td>2007–08</td>
<td>3,585</td>
<td>1,015.8</td>
</tr>
<tr>
<td>2008–09</td>
<td>3,575</td>
<td>979.2</td>
</tr>
<tr>
<td>2009–10</td>
<td>3,612</td>
<td>956.6</td>
</tr>
<tr>
<td>2010–11</td>
<td>3,650</td>
<td>936.4</td>
</tr>
<tr>
<td>2011–12</td>
<td>3,837</td>
<td>955.3</td>
</tr>
<tr>
<td>2012–13</td>
<td>3,487</td>
<td>843.0</td>
</tr>
</tbody>
</table>

a. Rates are age-standardised to the 2001 Victorian population.


Note: In July 2012 the Victorian hospital admission policy changed significantly so that episodes of care delivered entirely within a designated emergency department or urgent care centre could no longer be categorised as an admission regardless of the amount of time spent in the hospital. This has had the effect of reducing the number of admissions recorded on the VAED for the 2012–13 financial year. For this reason caution should be exercised when interpreting potential changes in the number of hospital admissions in 2012–13 compared with previous years (see ‘Limitations’).

The frequency of unintentional injury-related hip fracture admissions increased significantly over the 15-year period from 2,871 in 1998–99 to 3,375 in 2012–13. This represents an estimated annual change of 1.0 per cent (95% CI: 0.6–1.3) and an overall increase of 15.7 per cent (95% CI: 9.4–22.1).

However, the age-standardised unintentional injury-related hip fracture admission rate decreased significantly over the 15-year period from 1,117.6 per 100,000 people in 1998–99 to 815.3 per 100,000 people in 2012–13. This represents an estimated annual decrease of 2.3 per cent (95% CI: 2.7–2.0) and an overall reduction of 29.9 per cent (95% CI: 33.9–26.3).

In summary, while the number of fall-related hip fractures has increased, the rate per 100,000 population has decreased significantly over the period studied.
References


Concepts

Data selection: The operational definition of an injury, if the cause of injury was unintentional and the person aged 75 years or older is identified with an ICD-10 (International Classification of Diseases – 10th revision) code in the range S72.0–S72.2. Non-Victorian residents, deaths and transfers within and between hospitals and readmissions within 30 days were excluded.

Hip fracture: Fracture of the femoral neck, intrascapular region or upper epiphysis (separation) of the femur.

Unintentional injury: Injury cases that were documented as being ‘accidental’. This excludes injuries that were purposefully self-inflicted, purposely inflicted by other people, or of undetermined intent.

Injury: Defined as tissue damage resulting from either the acute transfer to individuals of the five forms of physical energy (kinetic or mechanical, thermal, chemical, electrical or radiation) or from the sudden interruption of normal energy patterns to maintain life patterns (Waller 1985).

Limitations

In July 2012 the Victorian hospital admission policy changed significantly so that episodes of care delivered entirely within a designated emergency department or urgent care centre could no longer be categorised as an admission, regardless of the amount of time spent in the hospital. Previously, these types of episodes could be categorised as an admission if the length of time in the hospital was four hours or more. This has had the effect of reducing the number of admissions recorded on the VAED for the 2012–13 financial year. For this reason VISU suggests caution should be exercised when interpreting potential changes in the number of hospital admissions in 2012–13 compared with previous years. Trend analysis for this indicator is only calculated for hospital admissions that separate on a date after the admission date (non-same-day admissions) as these admissions are less likely to be influenced by the change in admission policy.
In selecting injury indicators the definitions and validation tool developed by the International Collaborative Effort on Injury Statistics Indicators Group (Cryer et al. 2005) and the Injury Prevention Research Unit, University of Otago, New Zealand (Cryer, Langley & Stephenson 2004) were utilised with some adjustments. The extensive technical review of the injury indicators included in the Injury Prevention and Control National Health Priority Areas Program also informed our approach (Harrison & Steenkamp 2002).

Provenance
This indicator is a Victorian adaptation of an indicator developed in the Australian Institute of Health and Welfare review of National Health Priority Area injury indicators and data sources.

For more information
World Health Organization International Classification of Diseases (ICD)
http://www.who.int/classifications/icd/en/
http://apps.who.int/classifications/icd10/browse/2010/en

Department of Health, Falls prevention

Australian Government Department of Health and Ageing,
Don’t Fall For It – A guide to preventing falls for older people

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Deaths

This dimension incorporates age- and/or condition-specific deaths and life expectancy measures. Mortality data are important in the measurement of disease and consequently health in the planning of public healthcare. Studying trends in mortality over time assists in understanding how the health status of the population is changing and in planning for preventive measures. Measuring and comparing mortality rates across populations also helps to highlight health differences among different groups of people. The effect of changes in mortality is often best appreciated through increases in life expectancy. The mortality-based indicators presented in this section of the report include the following.

**Life expectancy at birth:** The average number of years that a newborn could expect to live if he or she were to pass through life subject to the age-specific death rates of a given period.

**Perinatal mortality:** The number of stillbirths and deaths in the first four weeks of life, expressed as a rate per 1,000 live births.

**Intentional self-harm mortality (suicides):** The number and rate (per 100,000 people) of deaths in Victoria due to intentional self-harm (suicide).

**Cancer survival:** The estimated proportion of people with a particular cancer who have survived at least five years from their diagnosis.

A note about mortality data:
Due to delays in accessing Cause of Death Unit Record Files (CODURFs) from the Australian Bureau of Statistics (ABS), the information presented for the indicators health-adjusted life expectancy, avoidable mortality and annual change in avoidable mortality rates were not revised for this current report, and have not been included. Readers can refer to the 2012 *Your health* report for this data: [https://www2.health.vic.gov.au/getfile/?sc_itemid=%7bE9DBC316-19C6-47FE-BD20-7AB8E5AB51CA%7d](https://www2.health.vic.gov.au/getfile/?sc_itemid=%7bE9DBC316-19C6-47FE-BD20-7AB8E5AB51CA%7d)
Life expectancy at birth

Description
The average number of years that a newborn could expect to live if he or she were to pass through life subject to the age-specific death rates of a given period.

Life expectancy at birth is an indicator of mortality conditions and, by proxy, of health conditions. It is also one of the most favoured indicators of social development. It is used as one of the components of the United Nations Development Programme’s Human Development Index. This indicator reflects many social, economic and environmental influences. It is closely related to other demographic variables, particularly the population growth rate. Mortality, with fertility and migration, determines the size of human populations, their composition by age, sex and ethnicity, and their potential for future growth.

Life expectancy at birth
Male and female life expectancy at birth has progressively increased over time (Figure 28). The most recent estimate for Victoria (2011–13) is 84.7 years for women and 80.7 years for men. The difference in life expectancy at birth between men and women has progressively decreased to 4.0 years in 2011–13 (ABS 2014).

Males have gained nine more years of life expectancy in 28 years; females gained six years.
Figure 28: Life expectancy at birth, Victoria, 2004–2014

Source: ABS 2015

References
Provenance
This indicator is used as one of the components of the United Nations Development Programme's Human Development Index.

For more information

Australian Institute of Health and Welfare, *Life expectancy*

Organisation for Economic Co-operation and Development Health Data, *Frequently requested data*

World Health Organization Statistical Information System (WHOSIS)

World Health Organization, *World health statistics 2008*

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Perinatal mortality

Description
The number of stillbirths and neonatal deaths, expressed as a rate per 1,000 total births (stillbirths and livebirths)

The perinatal mortality rate (PMR) is an important health status indicator that addresses the two related issues of late fetal death and early infant (neonatal) death, many cases of which may have contributing factors that could indicate that a death was avoidable. The reliability of perinatal mortality estimates depends on the accuracy and completeness of reporting and recording of births and deaths.

There were 928 perinatal deaths in Victoria in 2011, which equates to a PMR of 12.5 deaths per 1,000 total births. The stillbirth rate was 9.5 deaths per 1,000 total births, and the neonatal mortality rate was 3.0 deaths per 1,000 live births (Table 11).

Table 11: Perinatal deaths and crude and adjusted perinatal mortality rates, Victoria, 2005–2011

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
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<th>2011</th>
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<tbody>
<tr>
<td><strong>Number</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live birthsa</td>
<td>66,041</td>
<td>69,229</td>
<td>71,780</td>
<td>71,843</td>
<td>72,474</td>
<td>73,755</td>
<td>73,389</td>
</tr>
<tr>
<td>Stillbirths</td>
<td>599</td>
<td>607</td>
<td>672</td>
<td>682</td>
<td>767</td>
<td>738</td>
<td>705</td>
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<tr>
<td>Neonatal deaths</td>
<td>247</td>
<td>227</td>
<td>241</td>
<td>215</td>
<td>226</td>
<td>235</td>
<td>223</td>
</tr>
<tr>
<td>Perinatal deaths</td>
<td>846</td>
<td>834</td>
<td>913</td>
<td>897</td>
<td>993</td>
<td>973</td>
<td>928</td>
</tr>
<tr>
<td><strong>PMR per 1,000 birthsb</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stillbirths</td>
<td>9.0</td>
<td>8.7</td>
<td>9.3</td>
<td>9.4</td>
<td>10.5</td>
<td>9.9</td>
<td>9.5</td>
</tr>
<tr>
<td>Neonatal deaths</td>
<td>3.7</td>
<td>3.3</td>
<td>3.4</td>
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<td>3.1</td>
<td>3.2</td>
<td>3.0</td>
</tr>
<tr>
<td>Perinatal deaths</td>
<td>12.7</td>
<td>11.9</td>
<td>12.6</td>
<td>12.4</td>
<td>13.6</td>
<td>13.1</td>
<td>12.5</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number (adjusted for terminations of pregnancy for maternal psychosocial indications)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live births</td>
<td>66,039</td>
<td>69,229</td>
<td>71,780</td>
<td>71,843</td>
<td>72,474</td>
<td>73,755</td>
<td>73,389</td>
</tr>
<tr>
<td>Stillbirths</td>
<td>421</td>
<td>457</td>
<td>508</td>
<td>504</td>
<td>553</td>
<td>547</td>
<td>522</td>
</tr>
<tr>
<td>Neonatal deaths</td>
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<td>227</td>
<td>241</td>
<td>215</td>
<td>226</td>
<td>235</td>
<td>223</td>
</tr>
<tr>
<td>Perinatal deaths</td>
<td>666</td>
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<td>749</td>
<td>719</td>
<td>779</td>
<td>782</td>
<td>745</td>
</tr>
<tr>
<td><strong>PMR per 1,000 birthsb (adjusted for terminations of pregnancy for maternal psychosocial indications)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Stillbirths</td>
<td>6.3</td>
<td>6.6</td>
<td>7.0</td>
<td>7.0</td>
<td>7.6</td>
<td>7.4</td>
<td>7.1</td>
</tr>
<tr>
<td>Neonatal deaths</td>
<td>3.7</td>
<td>3.3</td>
<td>3.4</td>
<td>3.0</td>
<td>3.1</td>
<td>3.2</td>
<td>3.0</td>
</tr>
<tr>
<td>Perinatal deaths</td>
<td>10.0</td>
<td>9.8</td>
<td>10.4</td>
<td>9.9</td>
<td>10.7</td>
<td>10.5</td>
<td>10.1</td>
</tr>
</tbody>
</table>

a. Live births include babies born alive who died soon after, following induction of labour for congenital abnormalities and other fetal conditions.

b. Stillbirth and perinatal death rates were calculated using total births (live births and stillbirths) as the denominator. Neonatal death rates were calculated using live births as the denominator.

Source: Consultative Council on Obstetric and Paediatric Mortality and Morbidity 2014
In Victoria, terminations of pregnancy after 20 weeks’ gestation for maternal psychosocial indications (in the absence of fetal abnormality) are also required to be recorded as births and subsequently as perinatal deaths. A second (adjusted) PMR has been calculated excluding terminations of pregnancy for maternal psychosocial indications. The adjusted rate allows for better interpretation of the PMR as a public health indicator and for comparison with other jurisdictions. The adjusted PMR was 10.1 per 1,000 births, and the adjusted stillbirth rate in 2011 was 7.1 per 1,000 total births.

The crude and adjusted PMR decreased consecutively for the years 2010 and 2011 compared with 2009. The decrease can be explained by the overall decrease in stillbirths related to congenital anomalies and maternal conditions since 2009 (CCOPMM 2014). The full report from the Consultative Council on Obstetric and Paediatric Mortality and Morbidity should be referred to for further information. Data are available for more recent years and are available by contacting the Clinical Councils Unit.

References

Concepts
Avoidable death: An avoidable death is where an expert review identifies there were factors relating to the care that were highly likely to have directly contributed to the death (or where it was reasonable to expect a better outcome).

Live birth: The complete expulsion or extraction from its mother of a baby of at least 20 weeks’ gestation or, if gestation is unknown, weighing at least 400 g who, after being born, breathes or shows any evidence of life such as a heartbeat.

Perinatal death: Perinatal deaths refer to stillbirths and neonatal deaths and are grouped on the assumption that similar factors are associated with these losses. The CCOPMM defines perinatal death to include stillbirth and neonatal deaths within 28 days of birth of infants of over 20 weeks’ gestation or if gestation is unknown of birth weight exceeding 400 g.

Stillbirth: The complete expulsion or extraction from its mother of a baby of at least 20 weeks’ gestation or, if the gestation is unknown, weighing at least 400 g who did not, at any time after delivery, breathe or show any evidence of life such as a heartbeat.

Neonatal death: Refers to a death occurring within 28 days of live birth of an infant whose gestation was at least 20 weeks or, if gestation is unknown, weighing at least 400 g.
Limitations

There are different definitions in Australia for reporting perinatal deaths, which limits the comparability of the perinatal mortality rate between different jurisdictions. In Victoria, the CCOPMM reports on all perinatal deaths, irrespective of the mother’s usual place of residence, with gestation of at least 20 weeks, or where gestation is unknown, with a birth weight of at least 400 g. Alternatively, the ABS reports on perinatal deaths according to the mother’s usual place of residence, where the birth weight is at least 400 g, and if birth weight is unknown, a gestational age of at least 20 weeks. As such, the PMR reported by the ABS may differ from the PMR reported by the CCOPMM.

Provenance

The perinatal mortality rate is reported by the Department of Reproductive Health and Research, World Health Organization.

Contact

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Intentional self-harm mortality (suicides)

Description
The number and rate (per 100,000 people) of deaths in Victoria due to intentional self-harm (suicide)

Intentional self-harm mortality (suicide) refers to injury and poisoning cases where the injury causing death is purposefully self-inflicted. Cases of undetermined intent are excluded. Suicides are caused by a number of factors and there is no simple solution to prevent them. Prevention requires government to work in partnership with the community – individuals, families, schools, community groups and non-government services (Department of Human Services 2006). The Australian Government’s National suicide prevention strategy aims to reduce death from suicide and reduce suicidal behaviour by adopting a whole-of-community approach to suicide prevention to extend and enhance public understanding of suicide and its causes. The strategy also aims to increase the level of care and support available to people, families and communities affected by suicide or suicidal behaviour by providing better support systems (DoHA 2014).

Figures 29 and 30 show suicide rates in Victoria starting from 1998.

Figure 29: Number of deaths from intentional self-harm (suicide), Victoria 1998–2012

Break in trend line reflects changes in Australian Bureau of Statistics death registrations.
In 2012, 502 people died in Victoria due to intentional self-harm injury (suicide), a death rate of 8.9 per 100,000 people (Table 12). The trend in the frequency and rate of suicides over the period 1998–2012 cannot be estimated due to the introduction of the cause of death revisions process in 2006 by the Australian Bureau of Statistics (see ‘Limitations’).
**Table 12:** Number and rate\(^{a}\) (per 100,000 people) of deaths due to intentional self-harm (suicide), Victoria 1998–2012

<table>
<thead>
<tr>
<th>Year of death registration</th>
<th>Number</th>
<th>Rate per 100,000(^{a})</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>579</td>
<td>12.5</td>
</tr>
<tr>
<td>1999</td>
<td>552</td>
<td>11.8</td>
</tr>
<tr>
<td>2000</td>
<td>512</td>
<td>10.8</td>
</tr>
<tr>
<td>2001</td>
<td>541</td>
<td>11.4</td>
</tr>
<tr>
<td>2002</td>
<td>528</td>
<td>11.0</td>
</tr>
<tr>
<td>2003</td>
<td>540</td>
<td>11.1</td>
</tr>
<tr>
<td>2004</td>
<td>521</td>
<td>10.6</td>
</tr>
<tr>
<td>2005</td>
<td>506</td>
<td>10.1</td>
</tr>
<tr>
<td>2006</td>
<td>485</td>
<td>9.6</td>
</tr>
<tr>
<td>2007(^{b})</td>
<td>474</td>
<td>9.2</td>
</tr>
<tr>
<td>2008(^{b})</td>
<td>545</td>
<td>10.4</td>
</tr>
<tr>
<td>2009(^{b})</td>
<td>576</td>
<td>10.7</td>
</tr>
<tr>
<td>2010(^{b})</td>
<td>558</td>
<td>10.2</td>
</tr>
<tr>
<td>2011(^{b})</td>
<td>525</td>
<td>9.5</td>
</tr>
<tr>
<td>2012(^{b})</td>
<td>502</td>
<td>8.9</td>
</tr>
</tbody>
</table>

\(^{a}\) Rates are not age-standardised due to the lack of available unit record data.

\(^{b}\) Introduction of the cause of death revisions process by the Australian Bureau of Statistics for these years.


**Concepts**

The operational definition of a self-harm death is a case where the underlying cause of death is an ICD-10 (International Classification of Diseases – 10th revision) cause of death code in the range X60–X84, Y87.0 in Chapter XX (External causes of morbidity and mortality) of the ICD.

Data selection is based on Victoria as the state of usual residence.
Limitations


Care needs to be taken in interpreting figures relating to suicide due to limitations of data. See Technical Note: ABS coding of suicide deaths for further information http://www.abs.gov.au/ausstats/abs@.nst/Products/3303.0--2007~Technical+Note~ABS+Coding+of+Suicide+Deaths+%28Technical+Note%29?OpenDocument

Provenance

Cause of death data are reported by the Australian Bureau of Statistics.

For more information

World Health Organization International Classification of Diseases (ICD):
http://www.who.int/classifications/icd/en/
http://apps.who.int/classifications/icd10/browse/2010/en

Department of Health and Ageing, National suicide prevention strategy

Department of Human Services, Next steps: Victoria’s suicide prevention forward action plan 2006

Department of Human Services, Because mental health matters: Victorian mental health reform strategy 2009–2019

Department of Health, Suicide prevention: general information

Better Health Channel – Suicide and mental illness

Contact

Victorian Injury Surveillance Unit
Monash Injury Research Institute
Building 70, Monash University

Telephone: (03) 9905 1805
Email: visu.enquire@monash.edu
Cancer survival

Description
The estimated proportion of people with a particular cancer who have survived at least five years from their diagnosis

This indicator describes the survival of Victorians affected by cancer. Cancer survival is described here in terms of survival rates that have been calculated using the ‘period’ method. This method uses the most recent interval survival estimate of cases diagnosed in different calendar years (cross-sectional estimate of survival). Because the period method uses only the most recent survival experience, when there is an increasing trend in survival it provides a more up-to-date measure of recent survival (Victorian Cancer Registry 2015).

Overall, five-year survival for Victorians with cancer has increased from 47 per cent to 67 per cent in the period from 1986–1990 to 2008–2012, with a significant increase from 60 per cent to 67 per cent from the 2001–2005 to 2008–2012 time periods (Table 13).

Table 13: Five-year survival (percentage), by sex and cancer site, Victoria, 2008–2012

<table>
<thead>
<tr>
<th>Cancer site</th>
<th>All persons</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All persons</td>
<td>Male</td>
</tr>
<tr>
<td>Oral cavity</td>
<td>63</td>
<td>62</td>
</tr>
<tr>
<td>Salivary glands</td>
<td>71</td>
<td>65</td>
</tr>
<tr>
<td>Pharynx</td>
<td>59</td>
<td>58</td>
</tr>
<tr>
<td>Oesophagus</td>
<td>19</td>
<td>18</td>
</tr>
<tr>
<td>Stomach</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>Colorectal</td>
<td>67</td>
<td>66</td>
</tr>
<tr>
<td>Liver</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>Gallbladder</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Pancreas</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Larynx</td>
<td>64</td>
<td>65</td>
</tr>
<tr>
<td>Lung</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>Melanoma</td>
<td>89</td>
<td>86</td>
</tr>
<tr>
<td>Mesothelioma</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Connective tissue</td>
<td>63</td>
<td>62</td>
</tr>
<tr>
<td>Breast (female)</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

Five-year cancer survival has improved in the past 20 years from five in 10 to seven in 10.
Table 13: Five-year survival (percentage), by sex and cancer site, Victoria, 2008–2012 (continued)

<table>
<thead>
<tr>
<th>Cancer site</th>
<th>All persons</th>
<th>Percentage</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervix</td>
<td>–</td>
<td>–</td>
<td>74</td>
<td></td>
</tr>
<tr>
<td>Uterus</td>
<td>–</td>
<td>–</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>Ovary</td>
<td>–</td>
<td>–</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Prostate</td>
<td>–</td>
<td>93</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Testis</td>
<td>–</td>
<td>98</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Kidney</td>
<td>74</td>
<td>72</td>
<td>76</td>
<td></td>
</tr>
<tr>
<td>Renal pelvis</td>
<td>42</td>
<td>46</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Bladder</td>
<td>51</td>
<td>54</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Central nervous system</td>
<td>25</td>
<td>22</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Thyroid</td>
<td>94</td>
<td>90</td>
<td>96</td>
<td></td>
</tr>
<tr>
<td>Unknown primary</td>
<td>12</td>
<td>13</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Hodgkin lymphoma</td>
<td>89</td>
<td>89</td>
<td>88</td>
<td></td>
</tr>
<tr>
<td>CLL/small lymphocytic lymphoma</td>
<td>73</td>
<td>73</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>Diffuse large B-cell lymphoma</td>
<td>68</td>
<td>68</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td>Follicular lymphoma</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Plasma cell disorders</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>Other mature B-cell neoplasms</td>
<td>77</td>
<td>75</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td>Mature T- and NK-cell neoplasms</td>
<td>59</td>
<td>57</td>
<td>62</td>
<td></td>
</tr>
<tr>
<td>Acute lymphoblastic leukaemia</td>
<td>71</td>
<td>70</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>Acute myeloid leukaemia</td>
<td>26</td>
<td>26</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>Chronic myeloid leukaemia</td>
<td>79</td>
<td>79</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>Other chronic myeloproliferative diseases</td>
<td>81</td>
<td>78</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>Myelodysplastic syndromes</td>
<td>44</td>
<td>41</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>Myelodysplastic/myeloproliferative diseases</td>
<td>33</td>
<td>34</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>All cancer</td>
<td><strong>67</strong></td>
<td><strong>66</strong></td>
<td><strong>67</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Victorian Cancer Registry 2015

Cancers with the highest five-year survival rates were testis (98 per cent), thyroid (94 per cent), prostate (93 per cent), breast (89 per cent), melanoma (89 per cent), and Hodgkin lymphoma (89 per cent). Cancers with the lowest five-year survival rates were pancreas (six per cent), mesothelioma (seven per cent), liver (15 per cent), lung (15 per cent) and cancers of unknown primary site (12 per cent).
Survival rates were generally similar between males and females; however, where significant differences occurred, females tended to have the better prognosis, with the exception of cancer of the larynx, renal pelvis, bladder cancer and cancers of unknown primary site. Overall, the five-year survival rates were higher for females, compared with males for all cancer (Victorian Cancer Registry, 2015).

References


Concepts
‘Period’ survival analysis uses only the most recent interval survival estimate of cases diagnosed in different calendar years (cross-sectional estimate of survival). This method gives estimates that are both contemporary and precise (Brenner & Hakulinen 2007).

The estimate of period five-year survival for people between 2006 and 2010 uses the first-year interval survival for patients diagnosed in 2010, the two-year interval survival for patients diagnosed in 2009, and so on. Because the ‘period’ method uses only the most recent survival experience, when there is an increasing trend in survival it provides a more up-to-date measure of recent survival.

Provenance
Cancer statistics are reported by the Cancer Council Victoria, the Australian Bureau of Statistics and the Australian Institute of Health and Welfare.

For more information
Cancer Council Victoria

Better Health Channel – Cancer


Contact
Cancer Information Manager
Victorian Cancer Registry
Cancer Council Victoria

Telephone: (03) 9635 5000
Email: VCR@cancervic.org.au
Determinants of health
Determinants of health are factors that have either a positive or negative influence on health at the individual or population level. While there is general acceptance that the dimensions of health presented here influence health status and outcomes, the magnitude of these influences and their causal pathways are not always clear. The indicators in each dimension, covered by the second domain of the *National health performance framework* (2009), are shown below.

<table>
<thead>
<tr>
<th>Health behaviours: Attitudes, beliefs, knowledge and behaviours such as patterns of eating, physical activity, smoking and alcohol consumption.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Fruit and vegetable consumption</td>
</tr>
<tr>
<td>• Sugar-sweetened soft drink consumption</td>
</tr>
<tr>
<td>• Physical activity levels</td>
</tr>
<tr>
<td>• Smoking status</td>
</tr>
<tr>
<td>• Risk of harm from alcohol consumption</td>
</tr>
<tr>
<td>• Blood pressure checks</td>
</tr>
<tr>
<td>• Cholesterol checks</td>
</tr>
<tr>
<td>• Syphilis notifications</td>
</tr>
<tr>
<td>• Breast cancer screening participation</td>
</tr>
<tr>
<td>• Bowel cancer screening participation</td>
</tr>
<tr>
<td>• Cervical cancer screening participation</td>
</tr>
<tr>
<td>• Children fully immunised at age 60–63 months</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Biomedical factors: Genetic-related susceptibility to disease and other factors such as blood pressure, cholesterol levels and body weight.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Body weight status</td>
</tr>
<tr>
<td>• Newborn screening</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Community and socioeconomic factors: Community factors relating to social capital, such as support networks and community engagement, and socioeconomic factors such as housing, education, employment and income.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Population</td>
</tr>
<tr>
<td>• Socioeconomic factors</td>
</tr>
<tr>
<td>• Social connectedness</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental factors: Physical, chemical and biological factors such as air, water, food and soil quality.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Air quality</td>
</tr>
<tr>
<td>• Quality of drinking water</td>
</tr>
<tr>
<td>• Cooling tower water quality (Legionella)</td>
</tr>
<tr>
<td>• Salmonellosis (non-typhoidal)</td>
</tr>
</tbody>
</table>
Health behaviours

This dimension incorporates attitudes, beliefs, knowledge and behaviours such as patterns of eating, physical activity, smoking and alcohol consumption. The indicators for this dimension include the following.

Fruit and vegetable consumption: The proportion of adults aged 18 years or older who meet the guidelines for daily fruit and vegetable consumption. This indicator is included in the ‘Food and nutrition’ chapter.

Sugar-sweetened soft drink consumption: The proportion of adults aged 18 years or older who reported consuming sugar-sweetened soft drinks on a daily basis. This indicator is included in the ‘Food and nutrition’ chapter.

Physical activity levels: The proportion of adults aged 18 years or older who engage in sufficient time and sessions of physical activity to meet the national guidelines.

Smoking status: The proportion of adults aged 18 years or older who reported current smoking, by sex, over time.

Risk of harm from alcohol consumption: There are two measures included in this indicator:

1. The proportion of adults aged 18 years or older at long-term risk of harm from alcohol consumption.
2. The proportion of adults aged 18 years or older at short-term risk of harm from alcohol consumption.

Blood pressure checks: The proportion of adults aged 18 years or older who had a blood pressure check in the preceding two years.

Cholesterol checks: The proportion of adults aged 18 years or older who had a cholesterol check in the preceding two years.

Syphilis notifications: The number of notified cases, expressed as a rate per 100,000 population, by sex and age group, over time.

Breast cancer screening participation: The proportion of women aged 50–69 years who participated in the BreastScreen Victoria Program within a two-year period, over time.

Bowel cancer screening participation: The proportion of eligible people who participated in the Bowel Cancer Screening Program, by sex and age.

Cervical cancer screening participation: The proportion of women aged 20–69 years who participated in the Cervical Cancer Screening Program over a two-year period, by age group and region of residence.

Children fully immunised at age 60–63 months: The proportion of children, aged 60 months or older, but less than 63 months, who have received all scheduled vaccinations.
Physical activity levels

Description
The proportion of adults aged 18 years or older who engage in sufficient time and sessions of physical activity to meet the national guidelines.

Physical inactivity is a major modifiable risk factor for a range of conditions including cardiovascular disease, type 2 diabetes, some cancers, osteoporosis, depression and/or anxiety and falls among older people. Children and young people who are physically active have better cardio-metabolic, musculoskeletal and mental health, body composition and cardio-respiratory fitness (Okely et al. 2012). Additionally, evidence is accumulating of the adverse health effects of sedentary behaviours (sitting or lying down, except when sleeping) (Brown et al. 2012). Increased sedentary behaviour is associated with poorer cardiovascular, muscular, mental and behavioural health.

The evidence suggests that health benefits accrue with increasing levels of physical activity and that this protective effect occurs even if adopted in middle and later life. However, there is a greater rate of protective effect at the lower end of the activity scale. That is, there is no lower threshold for this health benefit, indicating that some activity is better than none. The level of health benefit achieved from physical activity also depends on the intensity of the activity.

In general, to obtain a health benefit from physical activity requires participation in moderate-intensity activities (at least). For adults, accruing 150 or more minutes of moderate-intensity physical activity (such as walking) on a regular basis over one week is believed to be ‘sufficient’ for health benefits and is the recommended threshold of physical activity according to the National physical activity guidelines for Australians (DoHA 1999). About 150 minutes of physical activity provides considerable health benefits (including reduced risk of cardiovascular diseases, diabetes, psychosocial and musculoskeletal problems). About 300 minutes of activity is required to prevent weight gain and some cancers (Brown et al. 2012). This information is incorporated into the 2014 National physical activity guidelines for infants, children, young people, adults and older Australians (Australian Government Department of Health 2014). This section reports against the 1999 national guidelines.

Overall, there was a significantly higher proportion of men who had engaged in sufficient physical activity (65.9 per cent) compared with women (61.7 per cent) in 2011–12. The highest proportion of men who engaged in sufficient physical activity were aged 18–24 years. While for women, the highest proportion who engaged in sufficient physical activity were aged 18–24 and 35–54 years (Table 14).
<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Sedentary 95% CI</th>
<th>Insufficient time and sessions 95% CI</th>
<th>Sufficient time and sessions 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>LL</td>
<td>UL</td>
</tr>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–24</td>
<td>1.6*</td>
<td>0.6</td>
<td>4.1</td>
</tr>
<tr>
<td>25–34</td>
<td>6.0</td>
<td>3.9</td>
<td>9.0</td>
</tr>
<tr>
<td>35–44</td>
<td>4.1</td>
<td>3.0</td>
<td>5.6</td>
</tr>
<tr>
<td>45–54</td>
<td>4.2</td>
<td>3.1</td>
<td>5.6</td>
</tr>
<tr>
<td>55–64</td>
<td>6.4</td>
<td>5.2</td>
<td>7.9</td>
</tr>
<tr>
<td>65+</td>
<td>8.6</td>
<td>7.5</td>
<td>9.8</td>
</tr>
<tr>
<td>Total</td>
<td>5.4</td>
<td>4.8</td>
<td>6.2</td>
</tr>
<tr>
<td>Females</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–24</td>
<td>2.0*</td>
<td>1.0</td>
<td>3.9</td>
</tr>
<tr>
<td>25–34</td>
<td>4.1</td>
<td>2.8</td>
<td>6.0</td>
</tr>
<tr>
<td>35–44</td>
<td>3.6</td>
<td>2.7</td>
<td>4.8</td>
</tr>
<tr>
<td>45–54</td>
<td>5.0</td>
<td>4.1</td>
<td>6.0</td>
</tr>
<tr>
<td>55–64</td>
<td>6.1</td>
<td>5.1</td>
<td>7.3</td>
</tr>
<tr>
<td>65+</td>
<td>10.8</td>
<td>9.8</td>
<td>12.0</td>
</tr>
<tr>
<td>Total</td>
<td>5.6</td>
<td>5.1</td>
<td>6.2</td>
</tr>
<tr>
<td>Persons</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–24</td>
<td>1.8*</td>
<td>1.0</td>
<td>3.2</td>
</tr>
<tr>
<td>25–34</td>
<td>5.1</td>
<td>3.8</td>
<td>6.7</td>
</tr>
<tr>
<td>35–44</td>
<td>3.9</td>
<td>3.1</td>
<td>4.8</td>
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<tr>
<td>45–54</td>
<td>4.6</td>
<td>3.9</td>
<td>5.4</td>
</tr>
<tr>
<td>55–64</td>
<td>6.3</td>
<td>5.5</td>
<td>7.2</td>
</tr>
<tr>
<td>65+</td>
<td>9.8</td>
<td>9.0</td>
<td>10.6</td>
</tr>
<tr>
<td>Total</td>
<td>5.5</td>
<td>5.1</td>
<td>6.0</td>
</tr>
</tbody>
</table>

Note that the figures may not add up to 100 per cent due to a proportion of ‘don’t know’ or ‘refused’ responses. Totals represent the estimate for Victoria and have been age-standardised to the 2011 Victorian population. LL/UL 95% CI = lower/upper limit of 95 per cent confidence interval. 
* Estimate has a relative standard error (RSE) of between 25 and 50 per cent and should be interpreted with caution. 
Source: Victorian Population Health Survey 2011–12
Sedentary behaviour was reported by 5.5 per cent of Victorian adults, with no significant difference between the men and women. The highest proportion of Victorians who reported sedentary behaviour were among men and women aged 65 years or older.

The distribution of physical activity levels in the Victorian population by age, socioeconomic status and geographic location are presented in the full report of the Victorian Population Health Survey 2011–12 (Department of Health 2014). Of the men who self-reported excellent or very good health 74.5 per cent engaged in sufficient physical activity compared with 49.3 per cent of those with fair or poor self-reported health. For women, 70.0 per cent of those with excellent or very good self-reported health engaged in sufficient physical activity, as did 44.8 per cent of those with fair or poor self-reported health.

The trend over time of physical activity levels in Victoria are presented in the full report of the Victorian Population Health Survey 2011–12 (Department of Health 2014). The proportions of men and women who engaged in sedentary behaviour, insufficient physical activity or sufficient physical activity remained unchanged between 2005 and 2011–12.

The 2008 Victorian Population Health Survey reported that there were no significant differences between Aboriginal and non-Aboriginal Victorians in the proportion who did or did not engage in sufficient physical activity to meet the Australian guidelines (Department of Health 2011).

References


Department of Health and Ageing (DoHA) 1999, National physical activity guidelines for adults, DoHA, Canberra.


Concepts

Walking for a minimum of 10 minutes is categorised as a moderate-intensity physical activity. Vigorous activity includes household chores (excluding gardening) and vigorous ‘other’ activities (for example, tennis, jogging, cycling and ‘keep-fit’ exercises).

The measure ‘sufficient time and sessions’ is the preferred indicator for measuring participation in a sufficient level of health-enhancing physical activity at a population level. Consistent with the guidelines, the ‘sufficient time and sessions’ definition for physical activity requires that an individual accrues 150 minutes or more of at least moderate-intensity physical activity regularly. The ‘sufficient’ time element of physical activity is calculated by adding the minutes of walking and the minutes of moderate-intensity activity, plus two times the minutes of vigorous activity (that is, the minutes of vigorous intensity activity are weighted by a factor of two).

Given this definition, a person is classified as being ‘sedentary’ if they report no minutes of physical activity for the relevant time period. ‘Insufficient’ physical activity is defined as some reported physical activity within the specified time period but either not spending enough time participating in physical activity (less than 150 minutes) or undertaking fewer than five sessions of physical activity per week. Individuals who satisfy the requirements with respect to both the amount of time and the number of sessions are classified as doing ‘sufficient’ physical activity.

Limitations

The data presented are based on self-report. The results may be subject to recall bias and should be interpreted with caution.

Provenance

Physical activity levels are reported by the Australian Bureau of Statistics and the Australian Institute of Health and Welfare.

For more information

Department of Health, Victorian Population Health Survey

Department of Health and Ageing, National physical activity guidelines for adults

Contact

Alison Markwick
Health Intelligence Unit, System Intelligence and Analytics
Portfolio Strategy and Reform Division
Department of Health and Human Services

Telephone: (03) 9096 2237
Email: alison.markwick@dhhs.vic.gov.au
Smoking status

Description
The proportion of adults aged 18 years or older who reported current smoking, by sex, over time.

Tobacco use is the single largest preventable cause of chronic illness and premature death from conditions such as cancer, cardiovascular disease and chronic obstructive pulmonary disease (AIHW 2012). Estimates suggest that, of all modifiable risk factors, tobacco is associated with the greatest disease burden in Victoria (Department of Human Services 2005). Smoking is an important risk factor for the three diseases that cause most deaths in Australia: heart disease, stroke and lung cancer. It is responsible for around 80 per cent of all lung cancer deaths (Scollo & Winstanley 2012). Smoking has also been linked to cancers of the mouth, pancreas, bladder, kidney, stomach and cervix (among others) and to respiratory diseases such as chronic obstructive pulmonary disease and emphysema.

Less than one in five (18.6 per cent) men and 12.9 per cent of women aged 18 years or older, were current smokers in 2011–12 (Table 15). The distribution of smoking levels in the Victorian population by age, socioeconomic status (SES) and geographic location are presented in the full report of the Victorian Population Health Survey 2011–12 (Department of Health 2014). Of the men whose household income was less than $40,000 per annum, 32.1 per cent were current smokers compared with 15.8 per cent of those with an annual household income greater than $100,000 per annum. For women, 20.6 per cent of those with a household income less than $40,000 were current smokers, as were 9.3 per cent of those with income less than $40,000.

There was a decrease in the proportion of men and women who were current smokers between 2003 and 2011–12 (data not shown).

The 2008 Victorian Population Health Survey (VPHS) reported that almost one in three (30.4 per cent, 95% CI: 23.7–38.0) Aboriginal Victorians were current smokers in 2008, a significantly higher proportion than their non-Aboriginal counterparts (19.0 per cent, 95% CI: 18.3–19.8). However, the 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey (AATSIHS) reported that 43.7 per cent (95% CI: 38.6–48.8) of Aboriginal Victorians were current smokers. There are substantial differences in the methodologies of the two surveys that will account for the difference between the two estimates. It is likely that the VPHS underestimates while the AATSIHS overestimates the prevalence of smoking, and that the true estimate lies somewhere in between the two estimates.
Table 15: Smoking status*, by age group and sex, Victoria, 2011–12

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Current smoker</th>
<th></th>
<th></th>
<th>Ex-smoker</th>
<th></th>
<th></th>
<th>Non-smoker</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>LL</td>
<td>UL</td>
<td>%</td>
<td>LL</td>
<td>UL</td>
<td>%</td>
<td>LL</td>
<td>UL</td>
</tr>
<tr>
<td><strong>Males</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–24</td>
<td>21.8</td>
<td>17.2</td>
<td>27.2</td>
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<td>77.0</td>
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<tr>
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<tr>
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<td>17.2</td>
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<td>49.7</td>
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<td>51.8</td>
<td>41.8</td>
<td>39.7</td>
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<tr>
<td><strong>Total</strong></td>
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<td>17.3</td>
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<td>29.0</td>
<td>27.8</td>
<td>30.2</td>
<td>51.9</td>
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</tr>
<tr>
<td><strong>Females</strong></td>
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<td>26.7</td>
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<td>13.8</td>
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<td>23.1</td>
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<td>51.5</td>
<td>49.8</td>
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</tr>
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<td>55–64</td>
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<td>65+</td>
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<td>7.8</td>
<td>36.3</td>
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<td>37.6</td>
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<tr>
<td><strong>Total</strong></td>
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<td>15.0</td>
<td>16.7</td>
<td>25.4</td>
<td>24.6</td>
<td>26.1</td>
<td>58.3</td>
<td>57.3</td>
<td>59.3</td>
</tr>
</tbody>
</table>

* A person who smoked ‘daily’ or ‘occasionally’ was categorised as a current smoker.
Note that the figures may not add up to 100 per cent due to a proportion of ‘don’t know’ or ‘refused’ responses.
Totals represent the estimate for Victoria and were age-standardised to the 2011 Victorian population.
LL/UL 95% CI = lower/upper limit of 95 per cent confidence interval
* Estimate has a relative standard error (RSE) of between 25 and 50 per cent and should be interpreted with caution.
Source: Victorian Population Health Survey 2011–12
Other sources of data

The Cancer Council of Victoria conducts its own annual telephone survey and in 2011 reported that the prevalence of daily smoking in adults aged 18 years or older was 12.8 per cent (Alexander, Hayes & Durkin 2012), similar to the 12.0 per cent reported in the 2011–12 VPHS.

The Australian Institute of Health and Welfare (AIHW) conducts the National Drug Strategy Household Survey (NDSHS) every three years, with the most recent survey conducted in 2013 (AIHW 2014). In 2013 the AIHW reported that the prevalence of daily smoking in Victoria was 12.2 per cent, similar to that reported in the 2011–12 VPHS (12.0 per cent). However, there are significant methodological differences between the two surveys. For example, the NDSHS is conducted by post and therefore has a lower response rate than the 2011–12 VPHS, and includes children aged 14 years and over.

The ABS conducts the National Health Survey approximately every five years. For the year 2011–12 (part of the 2011–13 Australian Health Survey), the ABS reported that the prevalence of current smoking in Victoria was 18.6 per cent (ABS 2013). This is statistically higher than the 15.8 per cent that the VPHS reported for same year. There are significant methodological differences between the two surveys. The NHS was conducted face to face and had a higher response rate (84.8 per cent) than the VPHS (66.8 per cent). Since the VPHS is conducted by landline telephone interview, it is likely that low SES adults are under-represented, potentially leading to an under-estimation of the prevalence of smoking because smoking has a strong association with SES. Moreover, it may be harder to conceal a smoking habit in a face-to-face interview, leading to more accurate reporting in the National Health Survey. Nevertheless, telephone surveys are a more affordable and cost-efficient method of collecting health data, allowing them to be conducted every year instead of every five years. Consequently the VPHS has accumulated nine years of data to form a time series in which real-time changes in risk factors and health outcomes can be tracked, such as the decline in smoking that Victoria continues to experience.

The prevalence of daily smoking in Victorian adults was similar to the national rate, according to the 2011-13 Australian Health Survey (ABS, 2013). The Victorian prevalence was higher than the Australian Capital Territory, and lower than Tasmania and the Northern Territory.

Smoking cessation

Quitting smoking, which is highly addictive, is associated with an increase in life expectancy of up to 10 years, if it occurs early enough. For example, quitting by the age of 30 removes almost all excess morbidity risk. People who quit at the age of 50 halve the risk of smoking-related death (CCV 2012).

There are currently over 700,000 smokers in Victoria.

While legislative and social marketing interventions in Victoria (and other jurisdictions) have increased the number of people who have never smoked, there is scope for further gains to be achieved in helping people to quit smoking, including by involving a range of health professionals, particularly in the primary health care sector. In order to reduce death and disease in the next 10 to 20 years, it is imperative that the rate at which smokers quit is accelerated, as well as making sure young people don’t start smoking.

One of the six priorities of the Victorian Public Health and Wellbeing Plan 2015-2019 is to continue to further reduce smoking rates with the ultimate aim of achieving a tobacco-free Victoria, including by focusing on smoking cessation support at the community level (via hospitals, general practitioners and community health services) (Department of Health and Human Services 2015).
References


Australian Institute of Health and Welfare (AIHW) 2012, Risk factors contributing to chronic disease, cat. no. PHE 157, AIHW, Canberra.


The Victorian Population Health Survey asked respondents how they would describe their smoking status over their lifetime. They were given the option of replying ‘I smoke daily’, ‘I smoke occasionally’, ‘I don’t smoke now, but I used to’, ‘I’ve tried it a few times but never smoked regularly’ or ‘I’ve never smoked’. Respondents who described themselves as daily or occasional smokers were categorised as ‘current smokers’ and those who described themselves as never having smoked or never having smoked regularly were categorised as ‘non-smokers’.

Respondents who had smoked at some point in their lives, but no longer smoked, were asked whether they had smoked at least 100 cigarettes or a similar amount of tobacco in their lifetime. Those who had smoked at least 100 cigarettes or its equivalent were categorised as ‘ex-smokers’ and those who had not were categorised as ‘non-smokers’.

Aboriginal status: In accordance with The health and wellbeing of Aboriginal Victorians: Victorian Population Health Survey 2008 supplementary report the term ‘Aboriginal’ is taken to include both Aboriginal and Torres Strait Islander people.

Limitations
The data presented are based on self-report. The results may be subject to recall bias and should be interpreted with caution.

Provenance
Smoking status is reported by the Australian Bureau of Statistics and the Australian Institute of Health and Welfare.

For more information
Department of Health, Victorian Population Health Survey

Australian Institute of Health and Welfare 2012, Risk factors contributing to chronic disease, cat. no. PHE 157, AIHW, Canberra.

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Portfolio Strategy and Reform Division
Department of Health and Human Services
Telephone: (03) 9096 2237
Email: alison.markwick@dhhs.vic.gov.au
Risk of harm from alcohol consumption

Description
There are two measures included in this indicator:

1. The proportion of adults aged 18 years or older at long-term risk of harm from alcohol consumption
2. The proportion of adults aged 18 years or older at short-term risk of harm from alcohol consumption

Regular consumption of alcohol above recommended levels, over time, places people at long-term risk of chronic ill health and premature death. Regular episodes of heavy drinking may place the drinker (and others) at risk of injury or death. The long-term consequences of regular use of alcohol may include cirrhosis of the liver, cognitive impairment, heart and blood disorders, ulcers, cancers and damage to the pancreas. In the short term, heavy drinking can result in acute alcohol-related problems, violence, risky behaviour, road trauma and injury. Significant psychosocial and economic consequences also arise from such patterns of drinking, not only for the individuals concerned, but also for their families and the wider community.

Based on the 2001 National Health and Medical Research Council (NHMRC) guidelines, long-term risk of harm due to alcohol consumption is associated with regular daily patterns of drinking alcohol, defined in terms of the amount typically consumed each week (43 or more standard drinks per week for men, 29 or more standard drinks per week for women). Short-term risk of harm due to alcohol consumption is associated with drinking levels on a single occasion (more than six standard drinks on a single occasion for men, more than four standard drinks on a single occasion for women).

In March 2009 the NHMRC introduced a new set of guidelines for alcohol, based on the best current evidence available (NHMRC 2009). The 2009 guidelines were based on a process that included a systematic search and analysis of the research on the health effects and risks of alcohol consumption published between 2001 and 2007. The 2009 guidelines stipulate that consuming no more than four standard drinks on a single occasion reduces the risk of alcohol-related injury arising from that occasion in both healthy men and women. By contrast, the 2001 guidelines stipulate that the short-term risk of alcohol-related harm is reduced if men or women consume up to six or four standard drinks respectively, on any one day, no more than three days per week. Both of these guidelines are attempting to measure the risk of injury due to consumption of alcohol. The 2009 guidelines, however, significantly reduced the threshold number of standard drinks considered to be safe in men, thus increasing the number considered to be at risk of injury due to alcohol consumption.

This indicator reports risk of harm from alcohol consumption based on the 2001 NHMRC guidelines (see ‘Concepts’).
The Victorian Population Health Survey 2011–12 found that 4.2 per cent of men and 2.5 per cent of women aged 18 years and older reported consuming alcohol at levels that were ‘risky’ or ‘high risk’ for long-term alcohol-related harm (Table 16). The majority of men (81.0 per cent) and women (73.8 per cent) who participated in the Victorian Population Health Survey 2011–12 were at low risk of long-term harm from alcohol consumption. The proportion of people who reported consuming alcohol at levels that were ‘risky’ or ‘high risk’ was similar across age groups, with the exception of those aged 45–54 years where there was a higher proportion at risk. Overall, a higher proportion of women (22.9 per cent) than men (13.9 per cent) reported abstaining from alcohol consumption.

Table 16: Long-term risk\(^{a}\) of harm from alcohol consumption, by age group and sex, Victoria, 2011–12

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Abstainer 95% CI</th>
<th>Low risk 95% CI</th>
<th>Risky or high risk 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>95% CI</td>
<td>%</td>
</tr>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–24</td>
<td>13.3</td>
<td>9.7–18.1</td>
<td>81.2</td>
</tr>
<tr>
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<td>9.3–16.0</td>
<td>82.4</td>
</tr>
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<td>35–44</td>
<td>13.0</td>
<td>10.9–15.5</td>
<td>82.5</td>
</tr>
<tr>
<td>45–54</td>
<td>12.7</td>
<td>11.0–14.7</td>
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<td>55–64</td>
<td>11.7</td>
<td>10.1–13.6</td>
<td>82.4</td>
</tr>
<tr>
<td>65+</td>
<td>19.1</td>
<td>17.4–20.8</td>
<td>77.2</td>
</tr>
<tr>
<td>All males</td>
<td>13.9</td>
<td>12.8–15.0</td>
<td>81.0</td>
</tr>
<tr>
<td>Females</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–24</td>
<td>12.1</td>
<td>9.2–15.9</td>
<td>84.3</td>
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<td>25–34</td>
<td>24.9</td>
<td>21.7–28.3</td>
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<td>55–64</td>
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<td>20.4–24.1</td>
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<td>65+</td>
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<td>33.2–36.6</td>
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<tr>
<td>All females</td>
<td>22.9</td>
<td>21.9–24.0</td>
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</table>
Table 16: Long-term risk\(^a\) of harm from alcohol consumption, by age group and sex, Victoria, 2011–12 (continued)

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Abstainer 95% CI</th>
<th>Low risk 95% CI</th>
<th>Risky or high risk 95% CI</th>
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<tr>
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<td>% LL UL</td>
<td>% LL UL</td>
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<tr>
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<td>16.9 15.4 18.5</td>
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<td>45–54</td>
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<tr>
<td>55–64</td>
<td>17.1 15.8 18.4</td>
<td>77.8 76.4 79.2</td>
<td>4.1 3.5 4.8</td>
</tr>
<tr>
<td>65+</td>
<td>27.7 26.5 28.9</td>
<td>68.7 67.4 69.9</td>
<td>2.7 2.3 3.1</td>
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<td>77.2 76.4 78.0</td>
<td>3.4 3.0 3.7</td>
</tr>
</tbody>
</table>

\(^a\) Long-term risk of alcohol-related harm refers to the increased risk of developing various cancers, cirrhosis of the liver, cognitive problems and dementia, and alcohol dependence.

Note that the figures may not add up to 100 per cent due to a proportion of ‘don’t know’ or ‘refused’ responses. Totals represent the estimates for Victoria and have been age-standardised to the 2011 Victorian population.

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

* Estimate has a relative standard error (RSE) of between 25 and 50 per cent and should be interpreted with caution.

** Estimate has an RSE greater than 50 per cent and is not reported as it is unreliable for general use.

Source: Victorian Population Health Survey 2011–12

More than one in seven men (12.7 per cent) and 5.6 per cent of women reported consuming alcohol at least weekly at levels that put them at short-term risk of alcohol-related harm (Table 17). Almost one-quarter (24.0 per cent) of men and more than one in five women (20.3 per cent) reported consuming alcohol at least once a year at levels that put them at short-term risk of alcohol-related harm. Being at short-term risk of alcohol-related harm was inversely related to age, with the highest proportion occurring in those aged 18–24 years. Of note is that the sex difference was observed in all ages, with the exception of men and women aged 18–24 years where women were just as likely as men to engage in levels of weekly alcohol consumption that put them at short-term risk of alcohol-related harm.

The distribution of alcohol consumption by the Victorian population by age, socioeconomic status and geographic location are presented in the full report of the Victorian Population Health Survey 2011–12 (Department of Health 2014).
Table 17: Short-term risk\(^a\) of harm from alcohol consumption, by age group and sex, Victoria, 2011–12

<table>
<thead>
<tr>
<th>Age group (years)</th>
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<th>Risky or high risk 95% CI</th>
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</tr>
<tr>
<td></td>
<td></td>
<td>Low % 95% CI</td>
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</tr>
<tr>
<td>45–54</td>
<td>35.4</td>
<td>32.7</td>
</tr>
<tr>
<td>55–64</td>
<td>41.2</td>
<td>38.6</td>
</tr>
<tr>
<td>65+</td>
<td>53.2</td>
<td>51.1</td>
</tr>
<tr>
<td><strong>All males</strong></td>
<td><strong>33.4</strong></td>
<td><strong>32.0</strong></td>
</tr>
<tr>
<td>Females</td>
<td></td>
<td>95% CI</td>
</tr>
<tr>
<td>18–24</td>
<td>22.5</td>
<td>18.0</td>
</tr>
<tr>
<td>25–34</td>
<td>29.0</td>
<td>25.7</td>
</tr>
<tr>
<td>35–44</td>
<td>34.3</td>
<td>32.1</td>
</tr>
<tr>
<td>45–54</td>
<td>42.4</td>
<td>40.2</td>
</tr>
<tr>
<td>55–64</td>
<td>51.4</td>
<td>49.2</td>
</tr>
<tr>
<td>65+</td>
<td>51.6</td>
<td>49.9</td>
</tr>
<tr>
<td><strong>All females</strong></td>
<td><strong>38.5</strong></td>
<td><strong>37.3</strong></td>
</tr>
<tr>
<td>Persons</td>
<td></td>
<td>95% CI</td>
</tr>
<tr>
<td>18–24</td>
<td>20.2</td>
<td>17.2</td>
</tr>
<tr>
<td>25–34</td>
<td>24.3</td>
<td>21.7</td>
</tr>
<tr>
<td>35–44</td>
<td>32.4</td>
<td>30.6</td>
</tr>
<tr>
<td>45–54</td>
<td>38.9</td>
<td>37.2</td>
</tr>
<tr>
<td>55–64</td>
<td>46.4</td>
<td>44.7</td>
</tr>
<tr>
<td>65+</td>
<td>52.4</td>
<td>51.0</td>
</tr>
<tr>
<td><strong>All persons</strong></td>
<td><strong>35.9</strong></td>
<td><strong>35.0</strong></td>
</tr>
</tbody>
</table>

\(^a\) Based on national guidelines (NHMRC 2001).

Note that the figures may not add up to 100 per cent due to a proportion of ‘don’t know’ or ‘refused’ responses.

Data are crude estimates, except for the totals, which represent the estimates for Victoria and have been age-standardised to the 2011 Victorian population.

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

\(^*\) Estimate has an RSE of between 25 and 50 per cent and should be interpreted with caution.

Source: Victorian Population Health Survey 2011–12
References


National Health and Medical Research Council (NHMRC) 2001, Australian alcohol guidelines: health risks and benefits, AusInfo, Canberra.

National Health and Medical Research Council (NHMRC) 2009, Australian guidelines to reduce health risks from drinking alcohol, Commonwealth of Australia, Canberra.

Concepts

The 2001 Australian alcohol guidelines: health risks and benefits (NHMRC 2001) emphasise patterns of drinking as opposed to levels of consumption (the average amount consumed). The concept of drinking patterns refers to aspects of drinking behaviour other than the level of drinking, and includes when, where and with whom drinking behaviour occurs, the type of drinks consumed, the number of heavy drinking occasions undertaken and the norms associated with drinking behaviour. The 2001 guidelines identified two main patterns of drinking behaviour as creating a risk to an individual’s health:

- excessive alcohol intake on a particular occasion
- consistent high-level intake over months and years.

Based on the 2001 guidelines, long-term risk of harm due to alcohol consumption is associated with regular daily patterns of drinking alcohol, defined in terms of the amount typically consumed each week. Short-term risk of harm due to alcohol consumption is associated with drinking levels on a single occasion.

<table>
<thead>
<tr>
<th></th>
<th>Long-term risk of harm</th>
<th>Short-term risk of harm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low risk</td>
<td>Risky</td>
</tr>
<tr>
<td>Males (on an average day)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Up to four per day</td>
<td>Five to six per day</td>
</tr>
<tr>
<td></td>
<td>Overall weekly levels</td>
<td>Up to 28 per week</td>
</tr>
<tr>
<td>Males (overall weekly levels)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>On an average day</td>
<td>Up to two per day</td>
</tr>
<tr>
<td>Females (on an average day)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Up to 14 per day</td>
<td>15–28 per week</td>
</tr>
<tr>
<td>Females (overall weekly levels)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on a standard drink containing 10 g or 12.5 mL of alcohol.

Source: NHMRC 2001
Abstainers from alcohol are those people who reported that they did not drink, or who had a drink in the past 12 months, but reported that they no longer drink (recent abstainers).

In March 2009 the NHMRC introduced a new set of guidelines for alcohol, based on the best current evidence available. The 2011–12 Victorian Population Health Survey did not analyse alcohol consumption by the 2009 guidelines since new questions need to be designed and tested to capture the pertinent information. Moreover, retaining use of the 2001 guidelines allows for the time series to be continued.

Limitations
The data presented are based on self-report. The results may be subject to recall bias and should be interpreted with caution.

Provenance
The risk of harm from alcohol consumption is reported by the Australian Institute of Health and Welfare in the National Drug Strategy Household Survey report.

For more information
Department of Health, Victorian Population Health Survey

National Health and Medical Research Council, Australian alcohol guidelines: health risks and benefits

National Health and Medical Research Council, Australian guidelines to reduce health risks from drinking alcohol

Australian Institute of Health and Welfare, National Drugs Strategy Household Surveys (NDSHS)

Contact
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Blood pressure checks

Description
The proportion of adults aged 18 years or older who report having a blood pressure check in the preceding two years

High blood pressure (hypertension) is a major risk factor for ischaemic heart disease, stroke, heart failure and kidney failure. The risk of disease increases with increases in blood pressure. The modifiable causes of high blood pressure include having a poor diet (especially a high salt intake), being overweight or obese, having high levels of alcohol consumption and insufficient levels of physical activity.

National Heart Foundation guidelines indicate that the assessment and management of raised blood pressure in adults should be based on a thorough clinical assessment that includes an estimate of a patient’s risk factors for cardiovascular disease, as well as regular monitoring of blood pressure levels (National Heart Foundation of Australia 2010). Information about blood pressure checks can provide insights into the status of cardiovascular disease prevention and management in Victoria.

The Victorian Population Health Survey 2011–12 found that a higher proportion of women (85.1 per cent) reported having had their blood pressure checked in the two years preceding the survey, compared with men (79.5 per cent). The proportion of people who reported having had their blood pressure checked increased with age (Table 18).

Table 18: Blood pressure checks in the preceding two years, by age group and sex, Victoria, 2011–12

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Males</th>
<th></th>
<th></th>
<th>Females</th>
<th></th>
<th></th>
<th>Persons</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>LL</td>
<td>UL</td>
<td>%</td>
<td>LL</td>
<td>UL</td>
<td>%</td>
<td>LL</td>
</tr>
<tr>
<td>18–24</td>
<td>46.5</td>
<td>40.8</td>
<td>52.2</td>
<td>67.8</td>
<td>62.5</td>
<td>72.7</td>
<td>56.9</td>
<td>52.9</td>
</tr>
<tr>
<td>25–34</td>
<td>67.8</td>
<td>63.0</td>
<td>72.3</td>
<td>80.5</td>
<td>77.2</td>
<td>83.4</td>
<td>74.1</td>
<td>71.2</td>
</tr>
<tr>
<td>35–44</td>
<td>78.5</td>
<td>75.8</td>
<td>81.1</td>
<td>81.8</td>
<td>79.8</td>
<td>83.6</td>
<td>80.2</td>
<td>78.5</td>
</tr>
<tr>
<td>45–54</td>
<td>88.5</td>
<td>86.6</td>
<td>90.1</td>
<td>89.3</td>
<td>87.9</td>
<td>90.5</td>
<td>88.9</td>
<td>87.7</td>
</tr>
<tr>
<td>55–64</td>
<td>94.2</td>
<td>92.8</td>
<td>95.3</td>
<td>93.1</td>
<td>91.8</td>
<td>94.1</td>
<td>93.6</td>
<td>92.7</td>
</tr>
<tr>
<td>65+</td>
<td>96.5</td>
<td>95.7</td>
<td>97.2</td>
<td>96.6</td>
<td>95.9</td>
<td>97.2</td>
<td>96.5</td>
<td>96.0</td>
</tr>
<tr>
<td>Total</td>
<td>79.5</td>
<td>78.1</td>
<td>80.8</td>
<td>85.1</td>
<td>84.0</td>
<td>86.1</td>
<td>82.3</td>
<td>81.4</td>
</tr>
</tbody>
</table>

Data are crude estimates, except for the totals, which represent the estimates for Victoria and have been age-standardised to the 2011 Victorian population.

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

Source: Victorian Population Health Survey 2011–12
References


Limitations

The data presented are based on self-report. The results may be subject to recall bias and should be interpreted with caution.

For more information

Department of Health, Victorian Population Health Survey

Department of Health and Ageing, Cardiovascular disease

World Health Organization, Cardiovascular disease
http://www.who.int/topics/cardiovascular_diseases/en/

National Heart Foundation

Contact

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Cholesterol checks

Description
The proportion of adults aged 45 years or older who reported having a cholesterol check in the preceding two years

High blood cholesterol is a major risk factor for ischaemic heart disease and stroke and is a major cause of atherosclerosis. The risk of disease increases with rising cholesterol levels, which for most people can be managed by controlling the amount of saturated fat in their diet.

The National service improvement framework for heart stroke and vascular diseases (NHPAC 2006) encourages strategies and supportive infrastructure to promote regular monitoring of cholesterol as part of a broader approach to risk factor assessment and management. Information about cholesterol checks can provide insights into the status of cardiovascular disease prevention and management in Victoria. While there is no established cholesterol screening program across Australia, current clinical guidelines recommend opportunistic total and high-density lipoprotein (HDL) cholesterol assessment as part of an assessment of absolute cardiovascular risk in adults aged 45 years or older or in Aboriginal and Torres Strait Islander peoples aged 35 years or older (RACGP 2012).

The results of the Victorian Population Health Survey 2011–12 show that in people aged 45 years or older, a higher proportion of men than women reported that they had had a blood cholesterol test in the previous two years (84.3 per cent and 80.6 per cent respectively) (Table 19). For both men and women, the proportions of those who had had their blood cholesterol checked increased with age. Although there is a high proportion of adults aged 45 years or older who reported having a blood cholesterol check, in the absence of a structured screening program it is difficult to ascertain the contribution of these tests to population health.

Table 19: Cholesterol checks in the preceding two years, by sex and age group, Victoria, 2011–12

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Males 95% CI</th>
<th>Females 95% CI</th>
<th>Persons 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>LL</td>
<td>UL</td>
</tr>
<tr>
<td>45–54</td>
<td>76.5</td>
<td>74.1</td>
<td>78.8</td>
</tr>
<tr>
<td>55–64</td>
<td>87.2</td>
<td>85.3</td>
<td>88.8</td>
</tr>
<tr>
<td>65+</td>
<td>90.0</td>
<td>88.7</td>
<td>91.2</td>
</tr>
<tr>
<td>Total (45+)</td>
<td>84.3</td>
<td>83.2</td>
<td>85.4</td>
</tr>
</tbody>
</table>

About 80 per cent of adults have had their blood cholesterol checked in the past two years.
References


National Health Priority Action Council (NHPAC) 2006, National service improvement framework for heart, stroke and vascular disease, Department of Health and Ageing, Canberra.


Limitations

The data presented are based on self-report. The results may be subject to recall bias and should be interpreted with caution.

There are a range of individuals under 45 years of age, including those with cardiovascular disease or those at especially high risk, for whom targeted cholesterol testing is an important management tool. Although the Victorian Population Health Survey also collects information about cholesterol checks in adults aged 18–44 years, it is not possible to distinguish the clinical reasons for testing in these groups.

For more information

Department of Human Services, Victorian Population Health Survey

Australian Government Department of Health, Cardiovascular disease

World Health Organization
http://www.who.int/topics/cardiovascular_diseases/en/

National Heart Foundation
cholesterol-in-food

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Blood borne viruses / sexually transmitted infections, with a focus on syphilis

Description
The number of notified cases, expressed as a rate per 100,000 population, by sex and age group, over time

Background: Syphilis and other blood borne viruses/sexually transmitted infections in Victoria

Sexual health is an important element of health and wellbeing. Sexual health requires respect, safety and freedom from discrimination and violence; it is influenced by gender norms and power dynamics; and is expressed through diverse sexualities (WHO 2015).

Sexually transmissible infections (STI) and blood borne viruses (BBV) place a significant burden on the Victorian community (Table 20). The past five years have seen significant advances in prevention, testing, treatment and management of human immunodeficiency virus (HIV), hepatitis B and C resulting in many affected people enjoying better health and living more engaged and productive lives than in the past.

Table 20: Notifications for BBV and STI in Victoria by year for the period 2009–2014

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlamydia</td>
<td>13,902</td>
<td>16,553</td>
<td>19,238</td>
<td>20,247</td>
<td>19,591</td>
<td>19,995</td>
</tr>
<tr>
<td>Gonorrhoea</td>
<td>1,480</td>
<td>1,758</td>
<td>1,863</td>
<td>2,432</td>
<td>2,965</td>
<td>3,272</td>
</tr>
<tr>
<td>Infectious syphilis</td>
<td>391</td>
<td>291</td>
<td>321</td>
<td>467</td>
<td>654</td>
<td>629</td>
</tr>
<tr>
<td>HBV Newly acquired</td>
<td>88</td>
<td>69</td>
<td>66</td>
<td>59</td>
<td>37</td>
<td>54</td>
</tr>
<tr>
<td>HBV unspecified</td>
<td>1,939</td>
<td>1,898</td>
<td>1,918</td>
<td>1,855</td>
<td>1,852</td>
<td>1,740</td>
</tr>
<tr>
<td>HCV Newly acquired</td>
<td>187</td>
<td>213</td>
<td>174</td>
<td>166</td>
<td>142</td>
<td>187</td>
</tr>
<tr>
<td>HCV unspecified</td>
<td>2,335</td>
<td>2,385</td>
<td>2,170</td>
<td>2,062</td>
<td>2,133</td>
<td>2,046</td>
</tr>
<tr>
<td>HIV</td>
<td>262</td>
<td>235</td>
<td>278</td>
<td>262</td>
<td>306</td>
<td>306</td>
</tr>
</tbody>
</table>

Chlamydia – Chlamydia is the most frequently notified infectious disease and sexually transmissible infection in Victoria and Australia. Chlamydia is most common in the 15–29 year age group, accounting for approximately 78 per cent of notified cases, a trend that has been consistent over the last 10 years.

Gonorrhoea – The number of cases and rate of gonococcal infection have been increasing in Victoria and across all Australian jurisdictions since 2009. Gonococcal infection has been highest among men aged 20–29 years and 30–39 years, and among women aged 20–29 years and 15–19 years.
**Infectious syphilis** (infections acquired in the last 2 years) – In Victoria, 94 per cent of syphilis cases are males, of which 78 per cent reported male to male sex as the route of transmission. For HIV negative men who have sex with men, the highest number of notifications is in the under 30 age group. For HIV positive men who have sex with men, the highest number of notifications is in the 40–49 age group.

**Hepatitis B** – While the rate of newly acquired hepatitis B is gradually declining as a result of vaccination, the rate of chronic hepatitis B remains relatively stable, with approximately 90% of cases in people born overseas. An estimated 55,000 Victorians are living with chronic hepatitis B.

**Hepatitis C** – An estimated 65,000 Victorians are living with chronic hepatitis C. Injecting drug use is the main route of transmission. Approximately 77% of cases are Australian born with the remaining 28% people born overseas.

**HIV** – An estimated 7,002 Victorians are living with HIV (as at 31 December 2014). In 2014, 93 per cent of HIV diagnoses were male and more than 60 per cent were in those aged 30 years or older. Transmission of HIV in Victoria continued to occur primarily through sex between men (77 per cent in 2014).

**Trends in syphilis notifications in Victoria**

The remainder of this chapter will focus on syphilis notifications in Victoria.

Syphilis is a sexually transmissible infection (caused by the organism *Treponema pallidum*). Syphilis is spread from person to person through unprotected sexual activity or via spread from mother to infant at birth.

The infection often begins with an ulcer (‘primary syphilis’), which progresses to a flu-like illness and a rash (‘secondary syphilis’), before entering a ‘latent’ phase where symptoms disappear but the infection remains inside the body. This latent phase can last for many years, before progressing to late syphilis (‘tertiary syphilis’), which can include neurological symptoms such as difficulty with muscle coordination, numbness, paralysis, blindness and dementia. Occasionally this may lead to death.

Syphilis is a notifiable disease in Victoria. Infectious syphilis notifications in Victoria rose 70-fold from nine cases in 2000 to 629 cases in 2014 (Figure 31). Syphilis notifications are at their highest levels since the condition became notifiable in 1991 (Figure 32).
Since 2004, 90 per cent or more of notified syphilis cases have been in males and the rate of infections in men has been highest in the 20-49 year age groups (Figure 33). During that period, the most syphilis notifications in males have been among men who have sex with men (average 81 per cent for the period 2004–2014). Among women, the infection rates were highest in the 20–29 and 30–39-year age groups.

In 2014 a total of 629 cases of infectious syphilis were notified in Victoria. 97 per cent of the cases were males and 78 per cent reported male to male sex as the route of transmission. 71 per cent of cases were acquired through a casual sexual contact. 38 per cent of the total cases reported were among people living with HIV. A quarter of the total cases were syphilis re-infections where the case had previously been treated for syphilis. The recent increase in notified syphilis cases has also been observed elsewhere in Australia; however, the largest increase has been reported in Victoria.
Figure 32: Notification rate for syphilis, by year and sex, Victoria, 2000–2014

Source: Department of Health and Human Services, Communicable Disease Epidemiology and Surveillance 2015

Figure 33: Notification rate for syphilis, by year and age group, total and by sex, Victoria, 2000–2014

Source: Department of Health and Human Services, Communicable Disease Epidemiology and Surveillance 2015
It is important to recognise that there are several factors that can impact on the increase in notifications of infectious syphilis cases. These could include changes in high-risk unprotected sexual practices, an increase in the rates of testing, and also targeted testing for syphilis in men who have sex with men. Testing data available through the Victorian Primary Care Network for Sentinel Surveillance for blood-borne viruses and sexually transmissible infections, a system that was established in 2006, show that the number of syphilis tests conducted at participating clinics increased between 2008 and 2013 by 56 per cent.

Prevention response for syphilis
The Victorian Government is committed to reducing rates of sexually transmissible infections and blood-borne viruses (such as HIV, hepatitis B and C) in the community through working with healthcare providers, and community and advocacy groups, to coordinate plans for prevention and management of blood borne viruses and sexually transmissible infections, and promote the best standards in testing, treatment and support services.

Surveillance data show that men who have sex with men are disproportionately affected by the Victorian syphilis epidemic; data also identify HIV-positive men who have sex with men are another at risk population. Innovative prevention measures are needed to reduce the transmission of syphilis in these at risk populations in Victoria.

The Department of Health and Human Services works with a range of community organisations and key affected populations to ensure prevention, early detection and treatment approaches are appropriate and effective. Preventative measures include safe sex campaigns and education about safe sex practices including use of condoms. These campaigns predominantly target young people, gay men and other men who have sex with men, people from migrant and refugee backgrounds, and Aboriginal and Torres Strait Islander Victorians. Specific campaign messages have been developed to increase community and primary care provider understanding of the need for regular testing for at-risk populations.

The Syphilis Stakeholder Advisory Committee was convened in October 2013 to respond to the sustained increase in syphilis notifications. The Committee is coordinating responses across three areas:

- Prevention – to increase recognition of early symptoms and subsequent presentation for clinical assessment;
- Screening – to increase testing for HIV positive men across all publicly funded agencies, and to increase access to testing for HIV negative men;
- Partner notification – to improve partner notification processes for syphilis.

The Syphilis response plan includes comprehensive monitoring and evaluation of key activities.

References

Limitations

The notification data underestimate the true incidence of syphilis in Victoria because of under-detection of asymptomatic infections and under-reporting by diagnosing medical practitioners.

Provenance


For more information

Communicable Diseases Intelligence

Infectious Diseases Epidemiology and Surveillance

Department of Human Services, The blue book: guidelines for the control of infectious diseases

Better Health Channel – Syphilis

Kirby Institute Annual Surveillance Report of HIV, viral hepatitis, STIs

Contact

Communicable Disease Epidemiology and Surveillance
Health Protection Branch
Regulation, Health Protection and Regions Division
Department of Health and Human Services

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Email: infectious.diseases@dhhs.vic.gov.au
Breast cancer screening participation

Description
The proportion of women aged 50–69 years who participated in the BreastScreen Victoria Program within a two-year period, over time

The BreastScreen Australia Program in Victoria aims to achieve significant reductions in mortality and morbidity from breast cancer by detecting the cancer early, when treatment is likely to be most successful. This national screening program invites women in the target age group to have free breast x-ray screening (mammography) at two-yearly intervals. Under a recent Commonwealth Project Agreement, the BreastScreen Australia Program has expanded the target age range from women aged 50–69 years to those aged 50–74 years. While mammography has been found to be the most effective with women in this age group, women aged 40–49 and 75 years or older are also eligible to participate in the program.

During the two-year period from 1 January 2011 to 31 December 2012, 54.5 per cent of eligible Victorian women participated in the BreastScreen Australia Program in Victoria. Participation was relatively steady between 2000–2001 and 2003–04 at around 59 per cent (Figure 34). Participation rates have declined in recent years to around 54 per cent. As the population ages, the number of women in the then target age group of 50–69 years has been increasing.

Figure 34: BreastScreen Victoria participation rates for the two-year screening cycle for women aged 50–69 years, 2000–2001 to 2011–2012

BreastScreen participation rates decreased to 54 per cent in 2012.

Source: Australian Institute of Health and Welfare 2014
References

Concepts
Screening: In medicine, screening is a strategy used in a population to detect a disease in individuals without signs or symptoms of that disease.

Participation rates: Participants are the number of women screened through BreastScreen Victoria in each two-year reporting period. The screening periods cover 1 January of the initial year to 31 December of the latter year indicated. Rates are the number of women screened as a percentage of the eligible female population, calculated as the average of the ABS’s estimated resident population and age-standardised to the Australian population at 30 June 2001.

Limitations
As these data reflect trends across the Victorian population, they may mask information about differences in participation between different groups of women. For example, data show that Aboriginal and Torres Strait Islander women and women from culturally and linguistically diverse backgrounds are under-screened.

These data do not include women screened by BreastScreen Victoria aged 40–49 years and 70 years or older who are not within the target population, nor women who choose to have regular mammography outside of the BreastScreen Victoria program.

Provenance
The Australian Institute of Health and Welfare reports on cancer screening trends.

For more information
BreastScreen Victoria
http://www.breastscreen.org.au/

BreastScreen Australia

Cancer Council Victoria interactive reports

AIHW breast cancer screening trends

Contact
Screening and Cancer Prevention
Screening and Preventive Health Programs
Prevention, Population, Primary and Community Health
Department of Health and Human Services
Telephone: (03) 9096 0404
Bowel cancer screening participation

Description
The proportion of eligible people who participated in the Bowel Cancer Screening Program, by sex and age

The National Bowel Cancer Screening Program (NBCSP) aims to reduce incidence and mortality from bowel cancer through screening to detect signs of bowel cancer through the faecal occult blood test (FOBT). In 2013, bowel (colon and rectum) cancer was the third most common new cancer (12 per cent of all cancers) in Victorians (Thursfield, Giles & Farrugia 2014). Bowel cancer can be treated successfully if detected in the early stages when it is still localised within the bowel. It is estimated that less than 40 per cent of bowel cancers are detected early. Eligible invitees for the NBCSP are sent an FOBT kit to complete and send back to a pathology lab for analysis.

The NBCSP has been phased in gradually. The target ages initially invited to screen in 2006 were people turning 55 and 65, with 50-year-olds added from July 2008. Sixty-year-olds were included from July 2013. In 2014, the Commonwealth Government announced the program would be gradually expanded to offer biennial screening to all Australians aged 50–74 by 2020.

Over 233,000 Victorians were invited in Phase 1 (August 2006 to June 2008). The overall participation rate for Phase 1, excluding those who had suspended their participation or opted off, was estimated to be 40.8 per cent in Victoria (AIHW 2008). The overall participation rate for Phase 2 (July 2008 to June 2011) of the NBCSP was estimated to be 38.9 per cent in Victoria (AIHW 2012). Participation in the program by Victorians further declined to 36.1 per cent for the July 2011 to June 2012 period (AIHW 2013).

In 2012–13, 232,439 Victorians aged 50, 55 and 65 years were invited to participate in the program, of which 79,015 (34 per cent) completed the FOBT kit (36,395 men and 42,620 women).

Participation was highest among people aged 65 years (40.9 per cent), followed by people aged 55 years (34.2 per cent), and lowest in people aged 50 years (28.7 per cent) (Figure 35). Despite having a higher bowel cancer incidence and mortality rate, the participation rate for men (31.5 per cent) was lower than the rate for women (36.4 per cent) (AIHW 2014).
Although the participation rate in Victoria in 2012–13 was similar to that for Australia (33.4 per cent), NBCSP participation remains lower than previous years. Participation rates were lower among Aboriginal and Torres Strait Islander communities, people with severe or profound activity limitation and people living in areas with the lowest socioeconomic status. Participation rates also decreased with increasing remoteness of area of residence (AIHW 2014).

References


Concepts

Screening: In medicine, screening is a strategy used in a population to detect a disease in individuals without signs or symptoms of that disease.

Evidence from clinical trials has shown that regular (biennial) screening using an FOBT, which can detect evidence of blood in the stool (faeces) not visible to the naked eye, can reduce mortality from bowel cancer by 15–33 per cent (AIHW 2012).

Participation: Data are presented for of eligible participants invited, from 1 July 2012 to 30 June 2013. Due to some variability between actual National Bowel Cancer Screening Register invitation dates and invitee target-age birthdays, those who were the following ages when invited (from 1 January 2012 to 30 June 2013) were included in the target-age cohorts in 2012–13 participation reporting: 50-year-olds (those aged 49–52 when invited), 55-year-olds (those aged 54–57 when invited) and 65-year-olds (those aged 64–67 when invited). Invitees who were outside the target ages or did not live in Australia at the time of invitation were excluded from analyses.

Participants in the program were defined as members of the eligible population who returned a completed FOBT kit, regardless of whether it was correctly completed. Those people in the eligible population who had opted off the NBCSP (due to reasons such as already having regular colonoscopies) or suspended their participation as at 31 December 2013 were included in analyses, as many had progressed through the screening pathway before opting off or suspending their participation.

Data are presented as crude participation rates. A crude rate is defined as the number of events over a specified period divided by the total population. Crude proportions (expressed as percentages) will generally underestimate the true proportions of the population who participated in the NBCSP. This is because at any point in time there are members of the population who are eligible to proceed to the next point on the screening pathway, but who have not yet had time to do so. For example, a person who has just received an invitation to screen may intend to participate in screening but may not have had time to do so. They will be counted in the denominator of the crude participation but not in the numerator (AIHW 2014).

Limitations

Information about participants and their screening outcomes is obtained from a number of sources through the screening pathway recorded in the National Bowel Cancer Screening Register. Data are collected on forms completed by participants, primary healthcare providers (PHCPs), colonoscopists, pathologists, nurses, medical administrative staff and/or other specialists involved in the screening pathway. Submission of these forms is not mandatory and, consequently, and there is the possibility of inconsistent reporting. Because of time lags in reporting and under-reporting by clinicians, data on PHCP consultations, colonoscopies and histopathological outcomes in this report may understate the true performance of the NBCSP in this period and should be interpreted with caution. It is unlikely that this jeopardises comparisons, as the risk of under-reporting is likely to be constant across populations (AIHW 2014).
Provenance
The Australian Institute of Health and Welfare reports on cancer screening trends.

For more information
National Bowel Cancer Screening Program

Australian Institute of Health and Welfare bowel cancer screening publications

Department of Health and Ageing, The Australian Bowel Cancer Screening Pilot Program and beyond: final evaluation report

Cancer Council Australia, Bowel cancer

Contact
Screening and Cancer Prevention
Screening and Preventive Health Programs
Prevention, Population, Primary and Community Health
Department of Health and Human Services
Telephone: (03) 9096 0404
The National Cervical Screening Program promotes two-yearly screening for cervical cancer in women between the ages of 18 (or two years after first sexual intercourse, whichever is later) and 69 years. The test used in the screening program is the Papanicolaou test (Pap test or Pap smear). The aim of the program is to find cervical cancer in its early stages, or to find changes in the body that indicate the disease is likely to develop in the future. Early detection of the disease increases the chance of successful treatment.

Although the National Cervical Screening Program targets women aged 18–69 years, collection of data is generally limited to women aged 20–69 years.

Over the past 20 years there has been a significant decline in the incidence and mortality of cervical cancer in Victorian women. In 2013 the age-standardised incidence rate of cervical cancer in Victoria was 4.3 per 100,000 women and the mortality rate was 1.0 per 100,000 women (Cancer Council Victoria 2014).

In 2012, 78% of the 213 Victorian women diagnosed with cervical cancer had either never been screened (47 per cent) or were lapsed screeners (last cervical screen greater than 2.5 years prior to diagnosis, 31 per cent) (VCCR 2014). The greatest impact of the cervical screening program has been on squamous cell carcinoma of the cervix, with age-standardised incidence rates declining from 6.3 per 100,000 women in 1989 to 1.5 per 100,000 in 2013. Cervical screening is less effective for the detection of adenocarcinomas, which now represent a larger proportion of all cervical cancers due to the success of the program in reducing the incidence of squamous cancers. It is anticipated that the incidence of adenocarcinomas will reduce over time following the introduction of the National Human Papillomavirus (HPV) Vaccination Program.

In 2013, 600,769 Pap tests were registered by the Victorian Cervical Cytology Registry (VCCR), representing 571,588 women. The estimated two-year (2012–2013) participation rate for women in the target population of 20–69 years in Victoria was 60.4 per cent, which is a slight increase from 60.0 per cent for the previous reporting period (2011–2012). Participation in 2012–2013 varied by age group, with women aged 50–59 years having the highest two-year screening rate and women aged 20–29 years having the lowest rate (Figure 36). As in previous years, participation rates in Victoria in 2012–2013 also varied by Department of Health and Human Services region of residence. These ranged from 56.9 per cent in the Northern and Western Metropolitan Region to 63.7 per cent in the Loddon Mallee Region (Figure 37).
A small decline in the participation in cervical screening over time for each age group was observed between 2000–2001 and 2010–2011. In 2012–2013, participation remained stable for women aged 20–29, decreased slightly for women aged 30–39 and increased in all other age groups, which has resulted in a slight increase in the participation rate for all women (data not shown; VCCR 2014). Typically women aged 40–49 years and 50–59 years have the highest two-year screening rates, and women aged 20–29 years have the lowest screening rate. This trend towards decreasing participation in young women has also been seen nationally and internationally (VCCR 2014).

Figure 36: Biennial cervical screening participation rates, by age group, Victoria, 2006–2013

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
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<td>20–29</td>
<td>52.7</td>
<td>51.2</td>
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<td>61.1</td>
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<td>40–49</td>
<td>66.5</td>
<td>65.9</td>
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<td>50–59</td>
<td>69.6</td>
<td>69.3</td>
<td>69.4</td>
<td>69.9</td>
<td>66.1</td>
<td>67.2</td>
<td>68.3</td>
</tr>
<tr>
<td>60–69</td>
<td>64.4</td>
<td>64.1</td>
<td>64.6</td>
<td>65.3</td>
<td>59.7</td>
<td>61.6</td>
<td>62.9</td>
</tr>
<tr>
<td>Total (20–69)</td>
<td>63.1</td>
<td>62.3</td>
<td>61.3</td>
<td>60.7</td>
<td>59.2</td>
<td>60.0</td>
<td>60.4</td>
</tr>
</tbody>
</table>

Source: Victorian Cervical Cytology Registry 2014
The National HPV Vaccination Program commenced in April 2007 and is already having a substantial impact on the prevalence of HPV infection and cervical lesions in vaccinated cohorts. Between 2007 and 2009, females aged 12–26 years were offered the quadrivalent HPV vaccination (Gardasil®) in a national catch-up program provided through schools, general practice and other community providers. Since 2009 the program has offered routine vaccination through schools for 12–13-year-old girls and, from 2013, vaccination to boys at 12–13 years, with a two-year catch-up program for 14–15-year-old boys. The decline observed in high-grade cervical abnormalities in women under 20 years of age is continuing, with the rate more than halving from 11 cases per 1,000 women screened in 2006 down to five cases per 1,000 in 2013. The high-grade detection rate for women aged 20–24 years is also progressively declining since 2008 (VCCR 2014).

A data linkage study by the Victorian Cytology Service (VCS) and the Australian Institute of Health and Welfare (AIHW) confirmed that the declines in high-grade abnormality rates among young women (aged 12–17 years in 2007) are due to the HPV vaccination program, with vaccinated women attending screening showing a significantly lower rate of high-grade abnormalities than unvaccinated women, after adjusting for age, socioeconomic status and area of residence. The impact of the vaccine was greatest for women completely vaccinated (three doses) at younger ages and for the more serious cervical abnormalities CIN3/AIS, which are more likely to be due to the vaccine HPV types (16 and 18) (Gertig 2013). The importance of continuing regular Pap tests for vaccinated women is emphasised as part of the National HPV Vaccination Program (DoHA 2012).
The proportion of Pap test results with a squamous cell abnormality (an abnormality of possible low-grade lesion or worse) in 2013 was 6.9 per cent. A definite high-grade abnormality (high-grade lesion with or without possible microinvasion or invasion, invasive squamous cell carcinoma) was reported in 0.7 per cent of Pap tests in 2013 (VCCR 2014).

References


Concepts
Screening: In medicine, screening is a strategy used in a population to detect a disease in individuals without signs or symptoms of that disease.


Limitations
There is potential for measurement error in the ‘eligible’ population due to uncertainty about the hysterectomy rate, which excludes women from eligibility. This is a particular consideration when looking at small area data with a relatively small female population. There is also potential for an overestimation of the number of women screened as a result of possible imperfect matching between multiple Pap tests and the same women. It is not expected that these data limitations would reduce the ability to make comparisons across regions or over time. In addition, where site of specimen information is not reported to the registry when a Pap test is taken from a woman without a cervix, the woman will be incorrectly included in the numerator.

The VCCR is a voluntary ‘opt-off’ registry; however, the proportion of women who are part of the screening program but decide to opt-off the VCCR is estimated to be less than one per cent.

Women aged over 70 years with a negative screening history are outside the eligible range for the screening program (refer to the National Cervical Screening Program at <www.cancerscreening.gov.au>).
Work is currently being undertaken to identify population groups that are under-screened. As part of the cervical screening program, the VCCR plays an important role in improving the screening participation of Victorian women by sending reminder letters and conducting research into under-screening. In 2012 the VCCR introduced a second Pap test reminder letter for Victorian women. Their evaluation showed that this letter increased participation among women overdue for a Pap test by 8.1 per cent compared with the previous time period before the letter was introduced (VCCR 2014).

Provenance
The Australian Institute of Health and Welfare reports on cancer Screening trends.

For more information
National Cervical Screening Program

National HPV Vaccination Program Register
http://www.hpvregister.org.au

Victorian Cervical Cytology Register

PapScreen Victoria
http://www.papscreen.org.au

Cancer Council Victoria interactive reports

Australian Institute of Health and Welfare

Cancer Council Australia
http://www.cervicalcancervaccine.org.au/

Contact
Victorian Cervical Cytology Registry
Telephone: (03) 9250 0399
Website: www.vccr.org

Screening and Cancer Prevention
Screening and Preventive Health Programs
Prevention, Population, Primary and Community Health
Department of Health and Human Services
Telephone: (03) 9096 0404
Children fully immunised at age 60–63 months

Description
The proportion of children aged 60 months or older, but less than 63 months, who have received scheduled vaccines processed and calculated quarterly by the Australian Childhood Immunisation Register.

Immunisation has been repeatedly demonstrated to be one of the most effective medical interventions to prevent disease. Vaccines are a safe and effective way to give children immunity against a number of potentially serious diseases.

Immunisation is one of the most cost-effective public health interventions by which to maintain and protect the health of the population through reducing, eliminating and eradicating preventable communicable diseases. Immunisation not only protects the individual but also protects the wider community from the spread of infection by decreasing the number of susceptible people in the population. Improvements in childhood vaccination coverage need to be maintained and gaps and inequities in coverage addressed in order to achieve the lowest possible incidence of vaccine-preventable diseases in the population (Department of Health 2013; Department of Human Services 2008).

Australian immunisation providers have contributed data to the Australian Childhood Immunisation Register (ACIR) since 1996. The ACIR, administered by Medicare Australia, is a national database containing data on immunisation given to children under seven years of age who are living in Australia. Details of vaccinations given to children are forwarded to the ACIR by recognised providers, for inclusion on the register in order to monitor immunisation coverage and service delivery.

The National Immunisation Program schedule specifies vaccines for children at different age milestones. Thirteen diseases are covered by the routine childhood vaccination schedule: hepatitis B, rotavirus, diphtheria, tetanus, pertussis (whooping cough), poliomyelitis, Haemophilus influenzae type b (Hib), pneumococcal, meningococcal C, measles, mumps, rubella and varicella (chickenpox). Vaccine coverage data is presented for Victorian children aged 60 to less than 63 months. These children have received their fourth vaccination for diphtheria, tetanus, pertussis, poliomyelitis and their second vaccination for measles, mumps and rubella, all prior to the age of five years. It is assumed that all previous vaccine doses were received.


The proportion of children aged between 60 and less than 63 months who received all scheduled vaccinations in Victoria was 92.6 per cent, the second highest among all jurisdictions in Australia at 30 September 2014 (Table 21), and this proportion has been consistent over recent years (Figure 38).
Table 21: Percentage of children 60–63 months of age (age calculated at 30 June 2014) assessed as fully immunised, date of processing 30 September 2014

<table>
<thead>
<tr>
<th>State</th>
<th>Number of children</th>
<th>% DTP</th>
<th>% polio</th>
<th>% Hib</th>
<th>% hep B</th>
<th>% MMR</th>
<th>% fully immunised</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT</td>
<td>1,333</td>
<td>93.8</td>
<td>93.6</td>
<td>0</td>
<td>0</td>
<td>93.5</td>
<td>93</td>
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<tr>
<td>NSW</td>
<td>24,716</td>
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<td>93</td>
<td>0</td>
<td>0</td>
<td>93.1</td>
<td>92.6</td>
</tr>
<tr>
<td>Vic.</td>
<td>18,425</td>
<td>93.2</td>
<td>93.2</td>
<td>0</td>
<td>0</td>
<td>93.1</td>
<td>92.6</td>
</tr>
<tr>
<td>Qld</td>
<td>16,475</td>
<td>92.9</td>
<td>92.9</td>
<td>0</td>
<td>0</td>
<td>92.8</td>
<td>92.5</td>
</tr>
<tr>
<td>SA</td>
<td>5,006</td>
<td>92.2</td>
<td>92.2</td>
<td>0</td>
<td>0</td>
<td>91.9</td>
<td>91.6</td>
</tr>
<tr>
<td>WA</td>
<td>8,519</td>
<td>90.7</td>
<td>90.7</td>
<td>0</td>
<td>0</td>
<td>90.5</td>
<td>90.1</td>
</tr>
<tr>
<td>Tas.</td>
<td>1,629</td>
<td>93.7</td>
<td>93.7</td>
<td>0</td>
<td>0</td>
<td>93.5</td>
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</tr>
<tr>
<td>NT</td>
<td>945</td>
<td>92.3</td>
<td>92.3</td>
<td>0</td>
<td>0</td>
<td>92.6</td>
<td>91.6</td>
</tr>
<tr>
<td>AUS</td>
<td>77,048</td>
<td>92.7</td>
<td>92.7</td>
<td>0</td>
<td>0</td>
<td>92.7</td>
<td>92.2</td>
</tr>
</tbody>
</table>

DTP (diphtheria/tetanus/pertussis), Hib (Haemophilus influenzae type b), hep B (hepatitis B), MMR (measles/mumps/rubella)
Source: Medicare Australia 2014

Figure 38: Percentage of children 60–63 months of age assessed as fully immunised in Victoria and Australia, 2008–2014

Source: Department of Health and Human Services Immunisation Section and Medicare Australia 2015
At 30 June 2014, 29 per cent (23 of 79) of Victorian local government areas (LGAs) achieved immunisation coverage greater than or equal to 95 per cent for children aged between 60 and less than 63 months. Hepburn and Mount Alexander LGAs reported the lowest coverage rate (80 to less than 85 per cent). Benalla, Buloke, Queenscliffe, Towong and West Wimmera LGAs reported 100 per cent coverage (Department of Health 2014).

References


Concepts
The Australian Childhood Immunisation Register (ACIR) provides quarterly vaccination coverage data for Victorian children aged between 12 to less than 15 months (cohort one), 24 to less than 27 months (cohort two) and 60 to less than 63 months (cohort three). The vaccination status of each cohort is assessed at the three key milestones of 12 months, 24 months and five years (60 months) of age. Coverage is measured three months after the last cut-off date for the cohort for completion of each milestone, to allow for delayed notification to the ACIR by immunisation providers. The 12-month milestone measures vaccinations due at six months of age and includes only vaccinations administered before the child turns 12 months old. Similarly, the 24-month milestone includes vaccinations due at 12 months of age and is administered before the second birthday. The five-year milestone includes vaccinations due at four years of age and administered before the fifth birthday. The calculation is based on the vaccination schedule for the cohort and includes only children enrolled with Medicare. It is assumed that notification of receipt of a later vaccine dose implies receipt of earlier doses, even if no earlier vaccination is recorded (third dose assumption). ACIR coverage reports show the percentage of children vaccinated with highest level appropriate for their age group.

Percent fully immunised = \[\frac{\text{no. children vaccinated}}{\text{no. children in register}}\] × 100
Only vaccines administered before 60 months are included in the coverage calculation. A child is defined as ‘fully vaccinated’ at age 60–63 months if they have received the fourth dose of diphtheria, tetanus and pertussis (DTP) vaccine, the fourth dose of oral poliomyelitis vaccine, and the second dose of measles, mumps and rubella vaccine (MMR).

Health professionals use the ACIR to monitor immunisation coverage levels and service delivery, and to identify regions at risk during disease outbreaks. ACIR data also:

- enable immunisation providers and parents or guardians to check on the immunisation status of an individual child, regardless of where the child was immunised
- form the basis of an optional immunisation history statement that informs parents and guardians of their child’s recorded immunisation history
- provide information about a child’s immunisation status to help determine eligibility for the Australian Government’s Child Care Benefit and Maternity Immunisation Allowance family assistance payments
- provide a measure of coverage at the national, state/territory and local levels
- provide information for the delivery of incentive payments and feedback reports to eligible immunisation providers.

Limitations

Several limitations exist regarding data available from the ACIR that must be considered when they are used to estimate vaccination coverage including: under-reporting; the fact that records are held only for children up to seven years of age; and that coverage is calculated only for children registered with Medicare. Participation in the ACIR is opt-out so it constitutes a nearly complete population register, as approximately 99 per cent of children are registered with Medicare by 12 months of age (Hull et al. 2014).

Provenance

One of the key performance indicators contained in the Australian Immunisation Agreement is having at least 90 per cent of children fully immunised at five years of age.

For more information

Australian Childhood Immunisation Register

Department of Health, Understanding childhood immunisation

Department of Health, Immunisation myths and realities: responding to arguments against vaccination, 5th edition

Department of Health, Immunisation
National Immunisation Program schedule

Better Health Channel – Childhood immunisation

Contact
Immunisation Section
Department of Health and Human Services

Telephone: 1300 882 008
Email: immunisation@dhhs.vic.gov.au
Biomedical factors

This dimension incorporates genetic-related susceptibility to disease and other factors such as blood pressure, cholesterol levels and body weight. The indicators for this dimension include the following.

**Body weight status:** The proportion of adults aged 18 years or older who are underweight, normal weight, overweight or obese, by sex and age group.

**Newborn screening:** The number of babies born in Victoria who have had a newborn screening test, over time.
Body weight status

Description
The proportion of adults, aged 18 years or older, who are underweight, normal weight, overweight or obese, by sex and age group

Overweight and obesity, or excess weight, is a major contributor to several chronic diseases (WHO 2013). Excess weight is a condition of abnormal and excessive fat accumulation, to the extent that the health and wellbeing of an individual may be adversely affected. The primary cause of excess weight is an imbalance in the long-term energy equation, with energy intake exceeding energy consumption. The measurement of excess weight as a risk factor for chronic disease is not simple because both overall fat and the anatomical distribution of fat contribute to chronic disease development and progression. At the population level, a common indicator of excess weight (approximating body fat) is the body mass index (BMI).

The results of the Victorian Population Health Survey 2011–12 show that half (50.1 per cent) of all people aged 18 years or older were overweight or obese, based on self-report (32.7 per cent were overweight and 17.5 per cent were obese) (Table 22). More than half (58.5 per cent) of all men in Victoria were overweight or obese compared with 42.1 per cent of women. A higher proportion of men were overweight (40.9 per cent) compared with women (24.8 per cent). There was no difference between the sexes in the prevalence of obesity. A higher prevalence of overweight and obesity was reported in people aged 45 years or older.

Obesity prevalence increased by 29 per cent between 2003 and 2011–12.

Table 22: Body weight statusa, by age group and sex, Victoria, 2011–12

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Underweight (&lt; 18.5 kg/m²)</th>
<th>Normal weight (18.5–24.9 kg/m²)</th>
<th>Overweight (25.0–29.9 kg/m²)</th>
<th>Obese (≥ 30.0 kg/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% 95% CI</td>
<td>% 95% CI</td>
<td>% 95% CI</td>
<td>% 95% CI</td>
</tr>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–24</td>
<td>3.7* 2.2 6.1</td>
<td>57.4 51.6 62.9</td>
<td>21.9 17.5 27.1</td>
<td>8.8 6.2 12.4</td>
</tr>
<tr>
<td>25–34</td>
<td>** ** **</td>
<td>43.7 38.8 48.8</td>
<td>38.4 33.5 43.4</td>
<td>12.9 9.9 16.7</td>
</tr>
<tr>
<td>35–44</td>
<td>0.6* 0.3 1.3</td>
<td>32.3 29.4 35.4</td>
<td>45.1 41.9 48.3</td>
<td>18.7 16.4 21.3</td>
</tr>
<tr>
<td>45–54</td>
<td>0.6* 0.3 1.2</td>
<td>27.6 25.2 30.2</td>
<td>45.5 42.8 48.3</td>
<td>23.6 21.3 26.1</td>
</tr>
<tr>
<td>55–64</td>
<td>0.4* 0.2 0.8</td>
<td>26.6 24.3 29.0</td>
<td>48.1 45.5 50.8</td>
<td>22.0 19.9 24.2</td>
</tr>
<tr>
<td>65+</td>
<td>0.7 0.5 1.2</td>
<td>32.8 30.8 34.8</td>
<td>43.4 41.4 45.5</td>
<td>18.9 17.4 20.7</td>
</tr>
<tr>
<td>All males</td>
<td>1.1 0.8 1.5</td>
<td>36.4 34.9 37.9</td>
<td>40.9 39.4 42.4</td>
<td>17.6 16.5 18.7</td>
</tr>
</tbody>
</table>
Table 22: Body weight status*, by age group and sex, Victoria, 2011–12 (continued)

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Underweight (&lt; 18.5 kg/m²)</th>
<th>Normal weight (18.5–24.9 kg/m²)</th>
<th>Overweight (25.0–29.9 kg/m²)</th>
<th>Obese (≥ 30.0 kg/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% 95% CI</td>
<td>% 95% CI</td>
<td>% 95% CI</td>
<td>% 95% CI</td>
</tr>
<tr>
<td>Females</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–24</td>
<td>9.8 6.9 13.8</td>
<td>60.6 55.2 65.7</td>
<td>11.9 9.1 15.5</td>
<td>6.3 4.2 9.4</td>
</tr>
<tr>
<td>25–34</td>
<td>4.3 3.0 6.2</td>
<td>51.5 47.8 55.3</td>
<td>20.4 17.6 23.4</td>
<td>14.7 12.4 17.4</td>
</tr>
<tr>
<td>35–44</td>
<td>2.3 1.7 3.1</td>
<td>47.8 45.4 50.2</td>
<td>26.0 23.9 28.2</td>
<td>16.9 15.2 18.7</td>
</tr>
<tr>
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<td>1.9 1.4 2.5</td>
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<tr>
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<td>30.8 28.8 32.8</td>
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<tr>
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<tr>
<td>All females</td>
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<td>45.2 44.0 46.5</td>
<td>24.8 23.9 25.8</td>
<td>17.3 16.5 18.1</td>
</tr>
<tr>
<td>Persons</td>
<td></td>
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<tr>
<td>18–24</td>
<td>6.7 5.0 8.9</td>
<td>58.9 55.0 62.7</td>
<td>17.0 14.3 20.2</td>
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<tr>
<td>25–34</td>
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<td>22.8 21.4 24.2</td>
</tr>
<tr>
<td>65+</td>
<td>1.5 1.2 1.8</td>
<td>34.1 32.9 35.4</td>
<td>36.5 35.2 37.8</td>
<td>20.2 19.1 21.3</td>
</tr>
<tr>
<td>All persons</td>
<td>2.3 2.0 2.7</td>
<td>40.8 39.8 41.8</td>
<td>32.7 31.8 33.6</td>
<td>17.5 16.8 18.2</td>
</tr>
</tbody>
</table>

a. Determined by calculation of body mass index (BMI)

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

Note that figures may not add up to 100 per cent due to a proportion of ‘don’t know’ or ‘refused’ responses.

Data are crude estimates, except for the totals, which represent the total for Victoria and have been age-standardised to the 2011 Victorian population.

* Estimate has a relative standard error of between 25 and 50 per cent and should be interpreted with caution.

** Estimate has a relative standard error of greater than 50 per cent and is not reported as it is unreliable for general use.

Source: Victorian Population Health Survey 2011–12

The distribution in the prevalence of overweight and obesity in the Victorian population by age, socioeconomic status and geographic location, along with changes in the prevalence of overweight and obesity in Victoria between 2003 and 2011–12 are presented in the full report of the Victorian Population Health Survey 2011–12 (Department of Health 2014). Between 2003 and 2011–12, the prevalence of obesity significantly increased by 29 per cent for all people, with similar increases for both men and women; however, the prevalence of overweight remained unchanged for both genders.
The 2008 Victorian Population Health Survey reported that while there were no statistically significant differences between Aboriginal and non-Aboriginal Victorians in body weight status, there was a substantially lower prevalence of overweight and higher prevalence of obesity in Aboriginal men compared with their non-Aboriginal counterparts, and a higher prevalence of obesity in Aboriginal women compared with their non-Aboriginal counterparts (Department of Health 2011).

**Measured overweight and obesity**

Studies comparing self-reported height and weight with actual physical measurements have shown that people tend to underestimate their weight and overestimate their height, resulting in an underestimation of their BMI. Data on measured height and weight are available from the Australian Health Survey 2011–12 (ABS 2013).

The results from the Australian Health Survey 2011–12 show that 61.0 per cent of all Australian people aged 18 years or older were overweight or obese (35.3 per cent overweight and 25.6 per cent obese). For children, results show that 23.7 per cent of all children aged 5–17 years were overweight or obese (17.6 per cent overweight and 6.1 per cent obese).

**References**


**Concepts**

Body mass index (BMI): Calculated from reported height and weight information, using the formula weight (kg) divided by the square of height (m²). The World Health Organization (2000) classifies adult body weight status based on the following BMI scores:

- **Obese**: 30.0 and greater
- **Overweight**: 25.0 to less than 30.0
- **Normal range**: 18.5 to less than 25.0
- **Underweight**: Less than 18.5

**Limitations**

Studies comparing self-reported height and weight with actual physical measurements have shown that people tend to underestimate their weight and overestimate their height, resulting in an underestimation of their BMI. Therefore, estimates of the prevalence of overweight and obesity in a population that are based on self-reported data are likely to be slightly lower than
actual values. A further cautionary note is that BMI cannot distinguish between body fat and muscle. Therefore, an individual who is very muscular with low body fat could have a high BMI estimate and be classified as obese.

Provenance
Body weight status is reported by the Australian Bureau of Statistics and the Australian Institute of Health and Welfare.

For more information
Department of Health, Victorian Population Health Survey

World Health Organization, BMI classification

Australian Institute of Health and Welfare, Overweight and obesity

Contact
Alison Markwick
Health Intelligence Unit, System Intelligence and Analytics
Portfolio Strategy and Reform Division
Department of Health and Human Services
Telephone: (03) 9096 2237
Email: alison.markwick@dhhs.vic.gov.au
Newborn screening

Description
The number of babies born in Victoria who have had a newborn screening test, over time

The goal of newborn screening is the early identification of 25 rare, but serious, congenital and metabolic disorders, including phenylketonuria, cystic fibrosis, congenital hypothyroidism and a number of other disorders that affect protein and fat metabolism. Early detection through screening ensures that the condition can be treated, or managed, as soon as possible and prevent lifelong disability, developmental problems and, in some cases, mortality.

Screening has been available in Victoria since the mid-1960s. The screening test is offered free of charge to all newborns in Victoria. While newborn screening is strongly recommended for all babies, it is a voluntary program in Australia (Department of Health 2011).

In 2013–14, 77,732 newborns were tested and 96 were identified as having one of the conditions screened for as part of the Newborn Screening Program (Figure 39).

Figure 39: Number of babies screened in Victoria 2003–04 to 2013–14

99.4 per cent of newborns in Victoria are screened.
The proportion of babies in Victoria having newborn screening is currently not able to be measured on an ongoing basis. A 2008 study, which involved record linkage of newborn screening tests (from Genetic Health Services Victoria) with birth data from the Perinatal Morbidity Statistics System (a register of all births 20 weeks or older in Victoria), estimated the proportion of babies screened in 2003. Results indicated that the uptake of newborn screening in Victoria was extremely high, with an estimated 99.4 per cent of babies being screened (Jacques et al. 2008). There were 375 births that were not matched to a newborn screening test, suggesting that these babies were not screened.

In August 2011 a new written consent process for newborn screening was introduced across all public and private maternity hospitals in Victoria. This provides an opportunity for discussion between parents and healthcare providers about newborn screening to increase parents’ knowledge and to support informed choice. A ‘two-stage’ written consent protocol allowed parents to give separate consent for their baby to be screened and for secondary use of the sample in de-identified health research. Twelve months of laboratory data from 2012 showed that, although refusals for screening increased, overall participation remained above 99 per cent. The percentage of parents opting out of research use was 6.5 per cent. Provider compliance with the new protocol was high, with only 1.4 per cent of cards received without a completed consent form (Charles et al. 2013).

References


Victorian Clinical Genetic Services 2014, *Quarterly reporting data, September 2014*
**Concepts**
Screening: In medicine, screening is a strategy used in a population to detect a disease in individuals without signs or symptoms of that disease.

**Limitations**
The uptake/participation rate is not reported because this value may be underestimated. The 2008 study found that a number of factors may contribute to why a birth is not matched with a newborn screening test, including name changes, neonatal death, having a homebirth, living in rural Victoria, having a short length of stay after birth, and not having any other children (Jacques et al. 2008).

**For more information**
Victorian Clinical Genetics Services (VCGS)

Better Health Channel – Newborn screening

**Contact**
Screening and Cancer Prevention
Prevention and Population Health Branch
Mental Health, Wellbeing and Ageing Division
Department of Health and Human Services
Telephone: (03) 9096 0404
Community and socioeconomic factors

This dimension includes community factors relating to social capital, such as support networks and community engagement, and socioeconomic factors such as housing, education, employment and income. Both socioeconomic and community factors have been shown to have an impact on the health and wellbeing of individuals. The indicators for this dimension include the following.

Population: The composition of the estimated resident population of Victoria at the beginning of a given period including components of natural increase (births and deaths – on a usual residence basis) and net overseas and interstate migration.

Socioeconomic factors: Selected socioeconomic indicators for the adult population, expressed as a percentage of the adult population.

Social connectedness: There are two measures included in this indicator:

1. Support networks: The proportion of adults aged 18 years or older who report an ability to get help from family, friends or neighbours when needed, by sex.
2. Community engagement: The proportion of adults aged 18 years or older who help out a local group as a volunteer, over time.
Population

Description
The composition of the estimated resident population (ERP) of Victoria at the beginning of a given period, including components of natural increase (births and deaths – on a usual residence basis) and net overseas and interstate migration.

The ERP is an estimate of the Victorian population that links people to a usual place of residence in Victoria. It includes all people, regardless of nationality or citizenship, who usually live in Victoria, with the exception of foreign diplomatic personnel and their families. It includes usual residents who are overseas for less than 12 months but excludes overseas visitors who are in Australia for less than 12 months.

The ERP adds value to the Census population figure by providing greater accuracy and intercensal updates. It is the official measure of the population and is used for a range of key decisions such as resource and funding distribution by government.

In June 2014 there were 5,841,667 people usually resident in Victoria (Table 23). There were 2,890,538 males and 2,951,129 females. Of the total population in Victoria on 30 June 2011, 47,333 identified as Aboriginal and/or Torres Strait Islander people.

<table>
<thead>
<tr>
<th>Period</th>
<th>Natural increase</th>
<th>Net overseas migration</th>
<th>Net interstate migration</th>
<th>Number of births</th>
<th>Number of deaths</th>
<th>Number of infant deaths</th>
<th>Total population growth</th>
<th>Estimated resident population</th>
</tr>
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<tr>
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<td></td>
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<td>2009</td>
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<td>72,087</td>
<td>2,592</td>
<td>71,906</td>
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<td>105,964</td>
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<td>3,131</td>
<td>71,951</td>
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<td>251</td>
<td>76,462</td>
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<td>50,311</td>
<td>3,372</td>
<td>72,907</td>
<td>36,313</td>
<td>216</td>
<td>86,959</td>
<td>2,761,846 2,820,824 5,582,670</td>
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<td>2012</td>
<td>39,763</td>
<td>55,734</td>
<td>2,335</td>
<td>76,299</td>
<td>36,536</td>
<td>211</td>
<td>97,832</td>
<td>2,809,865 2,870,637 5,680,502</td>
</tr>
<tr>
<td>2013</td>
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<td>60,637</td>
<td>7,528</td>
<td>74,308</td>
<td>35,889</td>
<td>228</td>
<td>106,584</td>
<td>2,862,595 2,924,491 5,787,086</td>
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<td>10,869</td>
<td>-44</td>
<td>18,810</td>
<td>9,095</td>
<td>52</td>
<td>20,540</td>
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<td>388</td>
<td>19,189</td>
<td>10,133</td>
<td>57</td>
<td>24,131</td>
<td>2,798,415 2,858,237 5,656,652</td>
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<td>19,450</td>
<td>8,859</td>
<td>43</td>
<td>23,850</td>
<td>2,809,865 2,870,637 5,680,502</td>
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<tr>
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<td>March</td>
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<td>18,983</td>
<td>8,495</td>
<td>57</td>
<td>30,345</td>
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<td>16,033</td>
<td>8,475</td>
<td>71</td>
<td>22,815</td>
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<tr>
<td>2014</td>
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<tr>
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<td>2,468</td>
<td>19,803</td>
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<td>49</td>
<td>22,063</td>
<td>2,890,538 2,951,129 5,841,667</td>
</tr>
</tbody>
</table>

Source: ABS 2014
The Department of Planning and Community Development report *Victoria in Future 2012* projects that Victoria’s population will grow to 7.3 million over the next 20 years (DPCD 2012). Overseas migration is expected to be the greatest driver of population growth during this period. Victoria’s age profile will become progressively older and household size will gradually decrease, with a lower proportion of families with children and more lone person and couple-only households.

**References**


**Concepts**

Usual residence: Defined as where each person lived or intends to live for six months or more from the reference date for data collection.

**Limitations**

After each Census, estimates for the preceding intercensal period are revised to ensure that the total intercensal increase agrees with the difference between the ERPs at the two respective Census dates.

**Provenance**

Population data are reported by the Australian Bureau of Statistics.

**For more information**


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Portfolio Strategy and Reform Division  
Department of Health and Human Services  
Telephone: (03) 9096 0384  
Email: leonard.piers@dhhs.vic.gov.au
Socioeconomic factors

Description
Selected socioeconomic indicators for the adult population, expressed as a percentage of the adult population

The health and wellbeing of individuals and populations are influenced by, and determined as the result of, the interactions among human biology, lifestyle and environmental (including social) factors, modified by health and other interventions. Socioeconomic characteristics are key determinants of health and wellbeing, and contribute to differences in health or ‘health inequality’ across the population (AIHW 2012; Wilkinson & Marmot 2003).

Despite significant achievements in public health in Victoria over the past century, the evidence on socioeconomic status (SES) and health in Australia is unequivocal: people lower in the socioeconomic hierarchy fare significantly worse in terms of their health. Specifically, those classified as having low SES have higher mortality rates for most major causes of death. Their morbidity profile indicates they experience more ill health (both physiological and psychosocial), and their use of healthcare services suggests they are less likely, or may have less opportunity, to act to prevent disease or detect it at an early stage.

As those with the highest SES are those who have the most resources, opportunities and power to make choices, this forms a ‘social gradient’, with overall health and wellbeing tending to improve at each step up the socioeconomic ladder (Marmot, Shipley & Rose 1984). Although it is clear that poor living and working conditions impair health and shorten lives, the pathways through which these factors act and are related are complex and not yet fully understood (AIHW 2008).

SES is typically measured by attributes that include educational attainment, occupational status and income. Greater levels of educational attainment are associated with higher levels of knowledge and other non-material resources likely to promote a healthy lifestyle. Education also provides formal qualifications that affect occupational status and associated income level. Occupational status reflects social status, power and material conditions related to paid work. Income provides individuals and families with necessary material resources (including housing and access to transport) and determines their purchasing power for accessing goods and services needed to maintain good health (Lahelma et al. 2004).

In addition to health information, the Victorian Population Health Survey collects information about SES (Department of Health 2012). In 2010 the survey showed that 10.5 per cent of households had a gross income less than $20,000 per annum.

The Australian Bureau of Statistics (ABS) also collects information about SES across a range of population surveys. The results of the ABS Labour Force Survey, which is a component of the Monthly Population Survey, show that 5.3 per cent of the Victorian labour force aged 15 years or older were unemployed for December 2011. The ‘Education and Work’ component of the survey, which is conducted in May each year, shows that 27.8 per cent of adults aged 15–64 years reported their level of highest educational attainment as Year 11 or below in 2011 (ABS 2011b; see also Figure 40).
The results of the ABS Household Income and Income Distribution Survey 2009–2010 show that approximately one-quarter (25.3 per cent) of homes in Victoria were rented, and the results of the General Social Survey 2010 show that 4.5 per cent of Victorians aged 18 years or older experienced difficulties with transport in getting to the places they needed to go in 2010.

Figure 40: Selected socioeconomic factors, Victoria, 2010–2011

- **Transport stress (cannot, or often has difficulty, getting to places needed, aged 18+ years)**: 4.5%
- **Housing (% households rented)**: 25.3%
- **Unemployed (% of total labour force, aged 15+ years)**: 5.3%
- **Education (% highest level of educational attainment was year 11 or below, aged 15–64 years)**: 27.8%
- **Gross household income (% ≤ $20,000 pa)**: 10.5%


**References**


Provenance
Socioeconomic factors are reported by the Australian Institute of Health and Welfare and the Australian Bureau of Statistics.

For more information

Department of Health, *Victorian Population Health Survey*

Department of Health, *The determinants of health*

Cannon R 2008, *The social determinants of health SACOSS information paper*,
South Australian Council of Social Service, Adelaide

World Health Organization, Copenhagen
http://www.euro.who.int/document/E81384.PDF

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Social connectedness

Description
There are two measures included in this indicator:

1. Support networks: The proportion of adults aged 18 years or older who report an ability to get help from family, friends or neighbours when needed, by sex
2. Community engagement: The proportion of adults aged 18 years or older who help out a local group as a volunteer, over time

Social connectedness, a social capital measure of how people come together and interact, is a key determinant of mental and physical health and wellbeing. Social connections that matter are considered to be those with family, friends, schools, work, sporting clubs, religious organisations, youth organisations and art organisations and in various forms of civic engagement (Keleher & Armstrong 2005). Increased social contact and stronger support networks are associated with better health, and some studies conclude that the benefits of strong social relationships may be as important to health as health risks such as tobacco smoking, physical inactivity, poor nutrition and high blood pressure (Wilkinson & Marmot 2003).

Families, friends and neighbours are among the more immediate sources of care and support for individuals if they need help with everyday activities or unforeseen emergencies. They are part of the social environment in which people spend a large part of each day and in which children grow and develop. Social and support networks refer to informal relationships that individuals have with family, friends, neighbours and other members of their community. These networks often serve as a resource, providing individuals with information or emotional, practical and financial support. These resources are often provided to an individual without obligation, as a form of reciprocity. At a social level, social and support networks provide individuals with a sense of belonging.

Ways of expressing community and civic engagement include being involved in the community through volunteering, being on a committee or decision-making body, or taking local action on behalf of an organised group. Volunteer-based organisations provide a vehicle for individuals or groups to address human, environmental and social needs. Volunteering helps individuals form interpersonal ties and develop their social networks. It provides a sense of purpose and connectedness within a group or community.

The Victorian Population Health Survey asks respondents whether they are able to get help from family, friends and neighbours if they need it. In 2011–12 more than eight in 10 people reported that they could definitely get help from family or friends if needed. A further 10.6 per cent felt they could ‘sometimes’ get help from family, while 12.3 per cent felt they could ‘sometimes’ get help from friends if needed. There were no significant differences between the sexes.

More than half (54.4 per cent) of people reported that they could definitely get help from neighbours if needed, and a further 21.2 per cent of people felt they could ‘sometimes’ get help. Being able to get help from neighbours was related to age, with a higher proportion of men and women aged 55 years or older reporting that they were able to get help from neighbours when needed (Table 24).
Table 24: Proportion of adults aged 18 years or older who reported an ability to get help from family, friends or neighbours when needed, by sex, 2011–12

<table>
<thead>
<tr>
<th></th>
<th>No, not at all</th>
<th>Not often</th>
<th>Sometimes</th>
<th>Yes, definitely</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% 95% CI</td>
<td>% 95% CI</td>
<td>% 95% CI</td>
<td>% 95% CI</td>
</tr>
<tr>
<td></td>
<td>LL</td>
<td>UL</td>
<td>LL</td>
<td>UL</td>
</tr>
<tr>
<td>Help from family</td>
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<td></td>
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</tr>
<tr>
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<td>3.4</td>
<td>2.1</td>
</tr>
<tr>
<td>Females</td>
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<td>4.2</td>
<td>3.1</td>
</tr>
<tr>
<td>Persons</td>
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<td>3.1</td>
<td>3.7</td>
<td>3.0</td>
</tr>
<tr>
<td>Help from friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>2.3</td>
<td>1.9</td>
<td>2.9</td>
<td>2.1</td>
</tr>
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<td>2.9</td>
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<td>Persons</td>
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<tr>
<td>Help from neighbours</td>
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<td></td>
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<td>7.4</td>
</tr>
</tbody>
</table>

Note that the figures may not add up to 100 per cent due to a proportion of ‘don’t know’ or ‘refused’ responses.

Data are age-standardised to the 2011 Victorian population.

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

Source: Victorian Population Health Survey 2011–12

The Victorian Population Health Survey measures the amount of voluntary effort undertaken by individuals in their local community. In 2011–12 more than one-fifth (23.6 per cent) of people reported definitely having helped out a local group as a volunteer, and a further 11.4 per cent sometimes did so. Men and women were similarly disposed to volunteer. The proportion of all people who volunteered did not significantly change between 2005 and 2011–12 (Figure 41).
Figure 41: Proportion of adults aged 18 years or older who help out a local group as a volunteer, Victoria, 2005 to 2011–12

Note that the figures may not add up to 100 per cent due to a proportion of ‘don’t know’ or ‘refused’ responses. Data are age-standardised to the 2006 Victorian population. Ordinary least squares regression was used to test for trends over time. Source: Victorian Population Health Surveys 2001 to 2011–12

References


For more information
Department of Health, Victorian Population Health Survey

http://www.euro.who.int/document/E81384.PDF

Keleher H, Armstrong R 2005, Evidence-based mental health promotion resource, Chapter 3: Promoting social inclusion and connectedness, report for the Department of Human Services and VicHealth, Melbourne:

Contact
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Portfolio Strategy and Reform Division
Department of Health and Human Services

Telephone: (03) 9096 2237
Email: alison.markwick@dhhs.vic.gov.au
Environmental factors

Environmental factors include physical, chemical and biological factors such as air, water, food and soil quality. All of these factors influence the health of Victorians. The indicators presented in this section of the report include the following.

**Air quality:** There are two measures included in this indicator:

1. **PM$_{10}$:** The number of days where the national objective for PM$_{10}$ was not met in Melbourne, over time (the national objective for PM$_{10}$ is a 24-hour average of 50 µg/m$^3$ with no more than five days where this level is exceeded)
2. **Ozone:** The number of days where the national objective for ozone was not met in Melbourne, over time (the national objective for ozone is to have no more than one day a year exceeding 0.10 parts per million for a one-hour average or 0.08 parts per million for a four-hour average)

**Quality of drinking water:** The proportion of the population supplied with drinking water who received water that complied with the *Escherichia coli* (*E. coli*) water quality standard, over time

**Cooling tower water quality (*Legionella):** There are two measures included in this indicator:

1. The proportion of *Legionella* detections in cooling tower water samples, over time
2. The number of notified cases of legionellosis, over time

**Salmonellosis (non-typhoidal):** The number of notified cases, expressed as a rate per 100,000 population, by age group, over time
Air quality

Description
There are two measures included for this indicator:

1. PM$_{10}$ fine particles: The number of days where the national objective for PM$_{10}$ was not met in Melbourne, over a year of monitoring (the national objective for PM$_{10}$ is a 24-hour average of 50 µg/m$^3$ or below with a goal of no more than five days where this level is exceeded)

2. Ozone: The number of days where the national objective for ozone was not met in Melbourne, over a year of monitoring (the national objective for ozone is to have no more than one day a year exceeding 0.10 parts per million for a one-hour average or 0.08 parts per million for a four-hour average)

Fine particles
Airborne particulate matter that is smaller than 10 micrometres (less than one-tenth the width of human hair) is also called fine particles or PM$_{10}$. Fine particles can exacerbate existing respiratory and cardiovascular conditions and exposure is associated with an increase in hospitalisations and premature mortality. The major sources of fine particles in an urban environment are emissions from motor vehicles (particularly diesel-powered), industry and wood combustion for heating. Smoke from bushfires and occasional dust storms also contribute to fine particles in the air environment.

The national objective is a 24-hour average of 50 µg/m$^3$ or below for PM$_{10}$, with the National Environment Protection Measure for Ambient Air Quality (NEPM Ambient Air Quality) goal being that by 2008 the objective is exceeded on no more than five days per year. In addition to this national objective, an advisory reporting value exists for PM$_{2.5}$, a smaller fraction of fine particles. This is a 24-hour average of 25 µg/m$^3$ or below.

The following is a summary of air monitoring of the PM$_{10}$ indicator in Melbourne up to and including 2013. It is however acknowledged that a major open cut brown coal mine fire occurred in early 2014 at the Hazelwood power station in the Latrobe Valley, producing significant smoke. Both types of fine particles (ie PM$_{10}$ and PM$_{2.5}$) were monitored during this event. The NEPM Ambient Air Quality and these two fine particle standards are currently undergoing review.

The PM$_{10}$ air monitoring for Melbourne highlights that the days where this national objective is not met are highly dependent on weather conditions and other factors. In some of the years between 2002 and 2010 Melbourne was adversely impacted by drought-related factors (particles from dust storms and bushfires). The spikes for both 2003 and 2006 can be attributed to bushfires. In 2009 the PM$_{10}$ objective was exceeded at all stations as a result of bushfires, planned burning, windborne dust and urban sources.

For 2010, 2011 and 2012 the NEPM Ambient Air Quality PM$_{10}$ goal of no more than five days a year above the objective value was met (Figure 42). This was most likely due to the increased rainfall resulting in less raised dust in the air, and wetter conditions limiting bushfire activity. In 2013, on the days when PM$_{10}$ exceedances occurred, these were attributed to local dust, fires, planned burning and urban emissions.
The PM$_{10}$ air quality monitoring is representative of the general air quality in Melbourne. The PM$_{10}$ air quality objective was met on almost all days in from 2010 to 2013, indicating that Melbourne’s air quality is generally good. Separate to ambient air monitoring of fine particles, the Environment Protection Authority Victoria (EPA Victoria) also undertakes monitoring of site-specific local area impacts that require targeted management.

Ozone

Ozone is a naturally occurring gas that is common in the lower atmosphere (the air we breathe). Higher concentrations of ozone are formed when, in the presence of sunlight, chemical reactions take place between pollutants including nitrogen dioxide and hydrocarbons. Ozone is also a pollutant and is the main ingredient in summer smog. Exposure to high levels of ozone can result in increases in asthma attacks and hospitalisations for heart and lung conditions.

High ozone levels typically occur in Melbourne when air masses are recirculated within the metropolitan area. Ozone is only a potential problem between late spring and early autumn and if there is enough warmth and sunlight for the chemical reactions to occur. Exceptional ozone events may occur if bushfire smoke is blown towards the city; however, most ozone events are a result of pollution generated in the urban area. Progressive improvements in vehicle emission standards have resulted in a reduction in the number of days where the national objective for ozone was not met.

The national objective for ozone is 0.10 parts per million for a one-hour average and 0.08 parts per million for a four-hour average. The NEPM Ambient Air Quality goal is, by 2008, to have no more than one day a year where these objectives are not met (as measured at each monitoring site).

During 2012 and 2013, the one-hour ozone objective was met at all stations (Figure 43). There were no exceedences of the four-hour ozone objective in 2012; however, in 2013 the four-hour ozone objective was met on all but one day (at four separate stations) in Melbourne (Table 25). The ozone objectives were exceeded on typical days that are warm to hot and have poor dispersion (low winds), typically conducive to formation of photochemical oxidants.

Graphs and tables

Air quality monitoring is performed in accordance with a modified form of Victoria’s monitoring plan (EPA 2002, available from <www.epa.vic.gov.au/publications>), AAQ NEPM Technical Papers and EPA’s NATA accreditation. Since implementing the AAQ NEPM monitoring plan for Victoria, a number of modifications and reviews of components of the original plan have been made. A review of the monitoring plan is underway and the monitoring plan will be finalised by the end of the 2015–16 financial year.
<table>
<thead>
<tr>
<th>Year</th>
<th>Maximum number of days</th>
<th>Average number of days</th>
</tr>
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<tbody>
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<tr>
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<tr>
<td>2013</td>
<td>8</td>
<td>2</td>
</tr>
</tbody>
</table>

24 hour PM$_{10}$ (average): involves averaging of the number of days where the objective is not met at each station within Melbourne.

24 hour PM$_{10}$ (maximum): the value for the monitoring station recording the highest number of days not meeting the air quality objective each year (that is the worst performing station for that year).

Source: EPA Victoria 2014
Figure 43: Number of days where the ozone objective was not met in Melbourne (worst monitoring station), by one-hour and four-hour ozone measures, 1988–2013

Source: EPA Victoria 2014
Table 25: Number of days where the ozone objective was not met in Melbourne (worst monitoring station), by one-hour and four-hour ozone measures, 1988–2013

<table>
<thead>
<tr>
<th>Year</th>
<th>1–hour ozone</th>
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<td>2007</td>
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<tr>
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<td>0</td>
</tr>
<tr>
<td>2013</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: EPA Victoria 2014

References


Concepts
The ozone in the air we breathe in the lower atmosphere or troposphere (up to 10 km above the earth’s surface) should be distinguished from ozone in the much higher stratosphere (above 10 km to 50 km above the earth’s surface – the ozone layer), which has the beneficial effect of absorbing harmful radiation.

Provenance
Air quality is assessed against the National Environment Protection Measure for Ambient Air Quality (NEPM Ambient Air Quality), which sets national standards for the six key air pollutants to which most Australians are exposed. The six key air pollutants are fine particles as PM$_{10}$, carbon monoxide, sulphur dioxide, nitrogen dioxide, photochemical oxidants (as ozone) and lead.

EPA Victoria measures ozone as a measure of photochemical oxidants and fine particles as PM$_{10}$ (the mass of airborne particles with diameter of equal or less than 10 micron or 0.010 millimetre), including dust in the air, as part of its Air Monitoring Program.

Ozone is measured at 10 sites in Melbourne and one site each in Geelong South and Traralgon. Small particles are measured at nine sites in Melbourne and one site each in Geelong South and Traralgon.

For more information
Environment Protection Authority Victoria

National Environment Protection Measure for Ambient Air Quality, National standards for criteria air pollutants in Australia

Ground-level ozone

Particulate matter

Contact
Environmental Health
Health Protection Branch
Regulation, Health Protection and Emergency Management Division
Department of Health and Human Services
Telephone: (03) 9096 0000
Quality of drinking water

Description

The proportion of the population supplied with reticulated drinking water who received water that complied with the water quality standard, over time. The drinking water regulations refer to drinking water quality standards for a range of parameters including metals, toxins, chemicals and bacteria. Of these there is one microbiological parameter, *Escherichia coli* (*E. coli*), that indicates recent contamination.

*E. coli* is a bacterium that can occur in water supplies as a result of recent faecal contamination from humans or animals. Detecting *E. coli* in treated drinking water supplies can indicate that the disinfection process is inadequate or has failed, or there has been intrusion of untreated water into the water supply system.

The quality of drinking water in Victoria is regulated by the *Safe Drinking Water Act 2003*. Regulations under the Act set a water quality standard for *E. coli*, which requires that at least 98 per cent of all drinking water samples collected over any 12-month period contain no *E. coli* per 100 mL of drinking water.

Under the Act, the state’s water corporations collect and report on this indicator on a monthly basis to the Department of Health and Human Services’ Water Program for each water sampling locality. Regulatory audits also occur every two years.

A water sampling locality is defined as an area of similar water quality. This is usually based on the area receiving reticulated drinking water from a single source, or water undergoing the same treatment process. In rural Victoria, localities usually equate to townships. In large regional centres and metropolitan Melbourne, localities are more likely to be based on the configuration for water distribution. At 30 June 2014 there were 25 water businesses regulated by the department under the regulatory framework, which cover a discrete geographic area divided into 474 ‘water sampling localities’.

In the period from 2005–06 to 2013–14, close to 100 per cent of the population was supplied with reticulated drinking water that complied with the *E. coli* water quality standard (Figure 44). The water sampling localities that were found to be noncompliant with the water quality standard were typically small, rural localities, which had little impact on the overall percentage of the population supplied with noncompliant water.

In 2013–14 almost all (99.9 per cent) of the population were supplied with reticulated drinking water that complied with the *E. coli* water quality standard.
Figure 44: Proportion of the population supplied with reticulated drinking water who received water that complied with the *Escherichia coli* (*E. coli*) water quality standard, Victoria, 2005–06 to 2013–14

Source: Department of Health and Human Services, Health Protection Branch 2014

References

Concepts
Supplied population: This is the population who were supplied with reticulated drinking water from localities managed by the state’s water corporations. In 2013–14 it was estimated that 5,554,450 Victorians were supplied with reticulated drinking water in 474 water sampling localities across Victoria.

For more information
Water Program – Health Protection Branch

Department of Health, Annual report on drinking water quality in Victoria 2013–14

Contact
Water Program
Health Protection Branch
Wellbeing, Integrated Care and Ageing Division
Department of Health and Human Services
Telephone: (03) 9096 0000
Cooling tower water quality (Legionella)

Description
There are two measures included in this indicator:

1. The proportion of Legionella detections in cooling tower water samples, over time
2. The number of notified cases of legionellosis, over time

Legionnaires’ disease ( legionellosis) is a serious and sometimes fatal form of pneumonia caused by the bacteria Legionella. Although not all cases of Legionnaires’ disease are severe, up to 10 per cent of cases can be fatal. There are more than 50 species of Legionella bacteria, but only a few cause disease in humans. The species that are most commonly associated with human disease are Legionella pneumophila and Legionella longbeachae (Heyman 2004).

Transmission is via inhalation of Legionella bacteria in very fine droplets of water called aerosols. Legionella bacteria are found naturally in the environment and thrive in warm water and warm, damp conditions. They are commonly found in bodies of water, soil and potting mix. Man-made water systems sometimes provide environments that enable Legionella bacteria to thrive. These man-made systems include showers, spa pools, fountains and cooling towers associated with air-conditioning and industrial cooling processes (Department of Human Services 2005).

The proportion of cooling tower water samples in which Legionella is detected is an exposure-based indicator that is used to gauge the success of the Legionella reform strategy (Department of Human Services 2000). The strategy has been progressively implemented since 1 March 2001.

This strategy, which is unique to Victoria, sees the Legionella Team conducting over 1000 inspections of cooling tower systems each year. These inspections are targeted at sites that have failed to register or renew the registration of the cooling tower system, where there has been a failure to audit the risk management plan or the audit of the risk management plan has identified a problem. The Legionella Team also conducts inspections in response to cases of Legionnaires Disease notified to the department. Samples of water are collected from the cooling tower as part of the inspection. The Public Health and Wellbeing Regulations 2009 (Vic) require remedial action to be conducted on a cooling tower system if Legionella is detected.

The number of Legionella detections in cooling tower samples in the period 2003–2013 was consistently low (Figure 45). A steady decrease in the number of cooling towers operating in Victoria has occurred over this time.

Overall, notifications of legionellosis have been on a downward trend since the introduction of the Legionella reform strategy in 2000 (Figure 46).
Figure 45: Proportion of Legionella detections in cooling tower water samples, Victoria, 2003–2013

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of registered cooling tower systems</td>
<td>5,859</td>
<td>5,390</td>
<td>5,091</td>
<td>4,852</td>
<td>4,630</td>
<td>4,475</td>
<td>4,301</td>
<td>4,098</td>
<td>3,881</td>
<td>3,739</td>
<td>3,601</td>
</tr>
<tr>
<td>Number of samples collected</td>
<td>717</td>
<td>1,259</td>
<td>808</td>
<td>1,195</td>
<td>644</td>
<td>623</td>
<td>887</td>
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<td>863</td>
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<tr>
<td>Proportion of samples where Legionella was detected (%)</td>
<td>4.32</td>
<td>4.77</td>
<td>4.08</td>
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<td>5.75</td>
<td>3.35</td>
<td>4.75</td>
<td>4.35</td>
</tr>
</tbody>
</table>

Source: Department of Health 2014
Figure 46: Number of notified cases of legionellosis and rate of *L. pneumophila* per 100,000 population, Victoria, 1995–2013

Source: Infectious Diseases Epidemiology and Surveillance 2014
References


Limitations

Cooling tower sampling: During the initial phase of the implementation of the *Legionella reform strategy*, the samples from cooling tower systems were collected on a fairly random basis.

Over the past few years, the Inspection and Sampling Program has focused on those cooling tower systems that have been identified as a higher potential risk.

There is no similar cooling tower system regulation dataset available in other jurisdictions with which this data can be compared.

Samples of water are collected from cooling tower systems by officers in the Legionella Team in the Health Protection Branch of the Department of Health and Human Services and sent to the Melbourne Diagnostic Unit for testing. The test results are entered into the EMERALD (Efficient Management of Electronic Registration And Licensing Data) database. Data has been revised since the previous edition of this report, due to the realignment of sample information to cooling tower inspection dates within this database.

Legionellosis notifications: Notified cases of laboratory-confirmed legionellosis are an under-representation of the true incidence of the condition in the community. It has been estimated that anywhere up to 16 per cent of community-acquired pneumonia cases are likely to be undiagnosed cases of legionellosis. Cases notified to the department are biased towards those who are more likely to seek medical attention and have a respiratory specimen collected, which is then tested specifically for *Legionella*; this includes those with more severe symptoms, cases with a longer duration of symptoms and, in particular, the elderly.
For more information
Department of Health – Environmental Health, Legionella

Infectious Diseases Epidemiology and Surveillance

Contact
Legionella Team
Health Protection Branch
Regulation, Health Protection and Regions Division
Department of Health and Human Services
Telephone: 1800 248 898
Email: legionella@dhhs.vic.gov.au

Communicable Disease Epidemiology and Surveillance
Health Protection Branch
Regulation, Health Protection and Regions Division
Department of Health and Human Services
Telephone: 1300 651 160
Email: infectious.diseases@dhhs.vic.gov.au
Salmonellosis (non-typhoidal)

Description
The number of notified cases, expressed as a rate per 100,000 population, by age group, over time

Salmonellosis is an acute bacterial disease that most commonly presents as acute gastroenteritis with a sudden onset of headache, abdominal pain, diarrhoea, nausea and vomiting. Dehydration may occur, especially among infants and the elderly. Infection may also present as septicaemia and may occasionally be localised in other body tissues, resulting in endocarditis, pneumonia, septic arthritis, cholecystitis and abscesses. Deaths are uncommon but may occur in the very young, the very old, the debilitated and the immunosuppressed. However, morbidity and associated costs of salmonellosis may be high.

Transmission is via the faecal–oral route and most commonly through ingestion of the organism in food derived from infected animals or food contaminated by faeces of infected animals or humans. Person-to-person and animal-to-person faecal–oral modes of transmission are uncommon but do occur.

Salmonellosis occurs as outbreaks and sporadic cases. In Victoria, incidence and the number of outbreaks is highest in summer and early autumn, although cases and outbreaks can occur at any time throughout the year. There are more than 2,000 serotypes of *Salmonella*, with *S. typhimurium* causing the majority of infections in Victoria.

In order to prevent infection, it is important to thoroughly cook all food derived from animal sources, particularly poultry, pork, eggs and meat dishes, and to avoid recontamination from raw food after cooking.

The number of notified cases and the notification rate of salmonellosis have increased steadily in Victoria between 2000 and 2013 (Figure 47). Notification rates of salmonellosis have been consistently high in the 0–4-year age group, with secondary peaks occurring in the 20–24 and 25–29-year age groups (Figure 48). The number of point source outbreaks of salmonellosis has fluctuated over the past five years. Eggs (predominantly ready-to-eat foods containing raw or lightly cooked eggs) were identified as the source for 70 per cent of the outbreaks notified between 2009–2013, where a food source was able to be identified (Table 26).
Figure 47: Notification rate of laboratory confirmed salmonellosis, per 100,000 population, Victoria, 2000–2013

Source: Department of Health and Human Services, Communicable Disease Epidemiology and Surveillance 2014

Figure 48: Notification rate of laboratory-confirmed salmonellosis, by age group, Victoria, 2009–2013

Source: Department of Health, Communicable Disease Epidemiology and Surveillance
### Table 26: Outbreaks of salmonellosis by food source, Victoria, 2009–2013

<table>
<thead>
<tr>
<th>Food source/Vehicle</th>
<th>2009</th>
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<td><strong>13</strong></td>
<td><strong>19</strong></td>
<td><strong>10</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

Source: Department of Health, Communicable Disease Epidemiology and Surveillance

### References


Department of Health and Human Services, Communicable Disease Epidemiology and Surveillance 2014, Unpublished data.

**Limitations**

Notified cases of laboratory-confirmed salmonellosis under-represent the true incidence of salmonellosis in the community. This is because most cases do not present to a doctor and have a faecal specimen collected. Cases notified to the department are biased towards those that are more likely to seek medical attention and have a faecal specimen collected, which includes those with more severe symptoms, cases that have a longer duration of symptoms and young children. Outbreaks that account for a large number of cases (> 100 cases), such as those that occurred in 2003 and 2005, are included in the annual case numbers. Many of these cases were detected through enhanced case finding rather than through passive surveillance.

**For more information**

Communicable Diseases Intelligence

Infectious Diseases Epidemiology and Surveillance

OzFoodNet

Department of Human Services, *The blue book: guidelines for the control of infectious diseases*

Better Health Channel – Gastroenteritis – salmonellosis

**Contact**

Communicable Disease Epidemiology and Surveillance
Health Protection Branch
Regulation, Health Protection and Regions Division
Department of Health and Human Services

Telephone: 1300 651 160
Email: infectious.diseases@dhhs.vic.gov.au
Technical notes

Indicator selection

Indicators were selected under each dimension and domain following consideration of their level of sensitivity and specificity, the availability of relevant reporting data, and their consistency with national and/or international best practice.

The indicators presented in this report will be reviewed and modified or replaced, as appropriate, prior to the development of the next edition of Victoria’s health: The Chief Health Officer’s report.

Revised indicators

Several indicators have been revised in this edition to expand the information they provide: the oral health status of adults and children have been combined as a single indicator in the ‘health conditions’ domain; an indicator in the wellbeing domain, reporting on the mental health status of Victorians, now includes information on depression in addition to psychological distress; risk of harm from alcohol consumption now encompasses short-term and long-term risk of harm; and social connectedness is included in the community and socioeconomic factors domain, and encompasses both support networks and community engagement. Several indicators have also been refined for clarity.

Indicators not revised in 2014 report

Unit record mortality data for Victoria has not been available after 2007; as such, avoidable mortality rates have not been updated. Health adjusted life-expectancy (HALE) is based on Burden of Disease (BoD) estimates. The Australian Institute of Health and Welfare (AIHW) is currently computing BoD estimates for 2011. It is expected new HALE estimates will be based on these estimates.

Statistical terminology

Crude rates

A crude rate is an estimate of a proportion of a population that experiences a specific event over a specified period. It is calculated by dividing the number of events recorded for a given period by the number at risk of the event in the population. Crude rates have been presented wherever rates have been broken down by age group (age-specific rates).

Age-standardisation

The age-standardised (or ‘age-adjusted’) rates that are presented in this report have been adjusted based on the direct method of standardisation. This method adjusts for effects of differences in the age composition of different populations (for example, between geographical areas) and allows for comparison between these populations. The direct age-standardised rates presented are based on the weighted sum of age-specific (for example, a five-year age group) rates in the population. The weights that have been used to calculate rates (the standard population) are referenced in the notes to tables and graphs throughout the report.
Standard error
The standard error is a measure of the variation in an estimate, produced by sampling a population. The standard error can be used to calculate confidence intervals and relative standard errors, providing the likely range of the true value of an estimate and an indication of the reliability of an estimate.

Relative standard error
A relative standard error (RSE) provides an indication of the reliability of an estimate. Rates with RSEs less than 25 per cent are generally regarded as ‘reliable’ for general use. The rates presented in tables and graphs in this report have RSEs less than 25 per cent, unless otherwise stated. Rates that have an RSE between 25 to 50 per cent have been marked with an asterisk (*) and should be interpreted with caution. For the purposes of this report, rates with RSEs more than 50 per cent were not considered reliable estimates and have not been presented. A double asterisk (**) has been included in certain tables where the rate would otherwise appear, indicating that the relevant RSE was greater than 50 per cent.

\[
\text{relative standard error (\%)} = \frac{\text{standard error}}{\text{point estimate}} \times 100
\]

Confidence intervals
A confidence interval is a computed interval with a given probability (for example, 95 per cent) that a true value of an estimate, such as a rate, is contained within the interval. Therefore, the confidence interval in this case is the likely range of the true value for the rate. Throughout the report, 95 per cent (%) confidence intervals have been included in tables and graphs.

\[
95\% \text{ confidence interval} = \text{point estimate} \pm \text{standard error} \times 1.96
\]

Statistical significance
Statistical significance provides an indication of how likely a result is due to chance. Significant differences between rates are deemed to exist where confidence intervals for rates do not overlap.

In some sections of the report, ordinary least squares linear regression models were used to test statistical significance. If the 95 per cent confidence interval for the regression coefficient did not include the value 0, the trends were considered to be statistically significant. Tables and graphs depicting time trends include notes about ordinary least squares linear regression, where relevant.

Throughout the report, the term ‘significance’ is used to denote statistical significance. It is not used to describe clinical significance, the relative importance of a particular finding, or the actual magnitude of difference between two estimates.
The report of the Chief Health Officer has been developed as required under s. 21(c) of the Public Health and Wellbeing Act 2008, which came into effect on 1 January 2010:

21 Functions and powers of the Chief Health Officer

The functions and powers of the Chief Health Officer are—

... 

(c) to publish on a biennial basis and make available in an accessible manner to members of the public a comprehensive report on public health and wellbeing in Victoria...
## Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>95% CI</td>
<td>95 per cent confidence interval</td>
</tr>
<tr>
<td>95% CI LL</td>
<td>lower limit of 95 per cent confidence interval</td>
</tr>
<tr>
<td>95% CI UL</td>
<td>upper limit of 95 per cent confidence interval</td>
</tr>
<tr>
<td>ABS</td>
<td>Australian Bureau of Statistics</td>
</tr>
<tr>
<td>ACIR</td>
<td>Australian Childhood Immunisation Register</td>
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<tr>
<td>ACSC</td>
<td>ambulatory care sensitive conditions</td>
</tr>
<tr>
<td>AIHW</td>
<td>Australian Institute of Health and Welfare</td>
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<tr>
<td>AM</td>
<td>avoidable mortality</td>
</tr>
<tr>
<td>BMI</td>
<td>body mass index</td>
</tr>
<tr>
<td>CCOPMM</td>
<td>Consultative Council on Obstetric and Paediatric Mortality and Morbidity</td>
</tr>
<tr>
<td>COAG</td>
<td>Council of Australian Governments</td>
</tr>
<tr>
<td>DEECD</td>
<td>Department of Education and Early Childhood Development</td>
</tr>
<tr>
<td>DoHA</td>
<td>Department of Health and Ageing</td>
</tr>
<tr>
<td>DPCD</td>
<td>Department of Planning and Community Development</td>
</tr>
<tr>
<td>DTP</td>
<td>diphtheria/tetanus/pertussis</td>
</tr>
<tr>
<td>EPA</td>
<td>Environment Protection Authority</td>
</tr>
<tr>
<td>ERP</td>
<td>estimated resident population</td>
</tr>
<tr>
<td>FOBT</td>
<td>faecal occult blood test</td>
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<tr>
<td>HALE</td>
<td>health-adjusted life expectancy</td>
</tr>
<tr>
<td>Hep B</td>
<td>hepatitis B</td>
</tr>
<tr>
<td>HIB</td>
<td>haemophilus influenzae type b</td>
</tr>
<tr>
<td>HPV</td>
<td>human papillomavirus</td>
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<tr>
<td>ICD-10</td>
<td>International Classification of Diseases – 10th revision</td>
</tr>
<tr>
<td>MMR</td>
<td>measles/mumps/rubella</td>
</tr>
<tr>
<td>NBCSP</td>
<td>National Bowel Cancer Screening Program</td>
</tr>
<tr>
<td>NEPM</td>
<td>National Environment Protection Measure</td>
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<tr>
<td>NHSSC</td>
<td>National Health Information Standards and Statistics Committee</td>
</tr>
<tr>
<td>Acronym</td>
<td>Full Form</td>
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<tr>
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<tr>
<td>NHMRC</td>
<td>National Health and Medical Research Council</td>
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<tr>
<td>NHPA</td>
<td>National Health Performance Agency</td>
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<tr>
<td>NHPAC</td>
<td>National Health Priority Action Council</td>
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<tr>
<td>NHPC</td>
<td>National Health Performance Committee</td>
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<tr>
<td>NPAPH</td>
<td>National Partnership Agreement on Preventive Health</td>
</tr>
<tr>
<td>PM$_{10}$</td>
<td>particles smaller than 10 micrometres</td>
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<tr>
<td>PMR</td>
<td>perinatal mortality rate</td>
</tr>
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<td>RACGP</td>
<td>Royal Australian College of General Practitioners</td>
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<td>RSE</td>
<td>relative standard error</td>
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<td>VAED</td>
<td>Victorian Admitted Episodes Dataset</td>
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<td>VBDR</td>
<td>Victorian Birth Defects Register</td>
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<tr>
<td>VCCR</td>
<td>Victorian Cervical Cytology Registry</td>
</tr>
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<td>VHIS</td>
<td>Victorian Health Information Surveillance System</td>
</tr>
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<td>VHPF</td>
<td>Victorian health priorities framework</td>
</tr>
<tr>
<td>VISU</td>
<td>Victorian Injury Surveillance Unit</td>
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<tr>
<td>WCRF/AICR</td>
<td>World Cancer Research Fund and the American Institute for Cancer Research</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
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