Changing patterns of mortality in Australia since 1900

4

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Key findings

Life expectancy has increased – from age 55 for people born in the early 1900s to age 80 or more for people born after 2010. Many factors, including medical advances, improved living conditions, and health promotion and prevention strategies have contributed to this gain.

Deaths from infectious diseases declined over the 20th century, while deaths from chronic conditions, such as cancers and dementia, have increased.

Key changes in mortality over the 20th century include:

- far fewer deaths in infants and children, as well as fewer maternal deaths
- a 98% decline in the age-standardised mortality rate from infectious diseases between 1907 and 2020. Infectious disease control measures and childhood immunisation led to substantial declines in mortality from tuberculosis, poliomyelitis (polio), diphtheria, tetanus, whooping cough, measles, mumps and rubella
- a rise and then a fall in mortality from cardiovascular diseases, although coronary heart disease continued to be Australia's leading cause of death in 2020
- a reduction in the number of lung cancer deaths due to decreasing prevalence of daily smoking
- notable changes in breast, bowel and cervical cancer incidence and mortality rates since cancer screening programs were introduced
- a reduction in the number of deaths from motor vehicle accidents due to substantial improvements in road and motor vehicle safety over the past 40 years. This trend also partly contributed to improved life expectancy in recent decades
- a decline in the number of workplace fatalities and injuries due to safer work practices and industry-level standards, acts and regulations
- an increase in recent years in the number of deaths of young people from suicide and external causes (such as drug misuse), affecting males more than females
- a marked increase in the number of dementia deaths, which is projected to continue with Australia's ageing population.

Despite achievements in public health in Australia over the 20th century, health inequalities, increased prevalence of chronic conditions, and pandemics are some of the challenges faced in the early 21st century.

Life expectancy in Australia has increased substantially since the start of the 20th century. People born in the early 1900s were expected to live, on average, to around age 55, contrasting markedly with people born after 2010 who are expected to live, on average, to age 80 or more (an increase of around 40% since the start of the 20th century). Life expectancy has increased both at birth, and for all ages. Once a person survives birth, childhood and adolescence, their life expectancy and chance of reaching older age increases.

For example, boys and girls aged 15 in 2018–2020 could expect to live to around 81.6 and 85.7, respectively (an increase of 17.6 and 18.8 years, respectively, since 1901). Men and women aged 65 in 2018–2020 could expect to live until 85.3 and 88.0, respectively (an increase of 9.0 and 10.1 years, respectively, since 1901).

Until 1932, infectious and parasitic diseases caused at least 10% of all deaths each year, with death rates from these diseases highest among the very young and very old (Jain 1994). Improvements in living conditions in the early 20th century – such as better water supplies, sewerage systems, food quality and health education – led to overall lower death rates and longer life expectancy at all ages.

During the 20th century, chronic diseases such as heart disease, stroke and cancer replaced infectious and parasitic diseases as the main causes of death of older people (Olshansky and Ault 1986). Infection control measures had improved in medical facilities, and public awareness of the value of preventive actions (such as hand washing) had grown. Increases in life expectancy at all ages in the second half of the 20th century have been attributed to improving social conditions, advances in medical technology (such as mass immunisation and antibiotics), and promotion and prevention strategies related to public health (Jain 1994).

The first 2 decades of the 21st century have seen even further increases in life expectancy – partially due to lower infant mortality, fewer young people dying in motor vehicle accidents, and fewer older people dying from heart disease. The reduction in deaths from heart disease has been linked to medical advances and behavioural changes, such as improvements in diet and less smoking (ABS 2018a).

With increasing life expectancy, Australians are living more years in full health (meaning no symptomatic disease or injury; also referred to as health-adjusted life expectancy). However, years lived in ill health are also increasing, resulting in little change in the proportion of life spent in full health between 2003 and 2018 (AIHW 2021c).

Mortality levels and trends provide important information on the many serious diseases and injuries that affect people. Although information on death and its causes cannot provide a complete picture of Australia's health, it can contribute much to that picture and help in assessing the nature and extent of progress. For background information on the prevalence of selected diseases, see the 'Health status' domain at https://www.aihw.gov.au/reports-data/australias-health/australias-health-snapshots.

Australia saw the transition from infectious to chronic diseases in the first half of the last century, where deaths due to chronic diseases (such as cancer and cardiovascular diseases) were on the rise and deaths due to infectious diseases were declining. Examining trends in mortality statistics such as these can help to explain how the health status of a population is changing and assist in evaluating a health system (see also Chapter 5 'Australia's healthcare system: its evolution from the Spanish influenza to COVID-19').

There have been a number of major developments and transitions in factors affecting the health and mortality of Australians over the 20th century and early 21st century. This article describes several trends that have affected the health of Australians since the start of the 20th century. Long-term trend data with a focus on mortality are examined for the following health topics:

- infant, child and maternal mortality
- infectious diseases, new viruses and vaccinations
- chronic diseases and cardiovascular disease mortality
- smoking, lung cancer and cancer screening programs
- injury (including road traffic accidents, workplace fatalities, accidental poisoning and suicide)
- dementia.

Examining long-term health trends across the entire 20th century (where data are available) through to recent times provides valuable information to researchers, administrators and policymakers. This information can help to identify major turning points where diseases may have increased due to social factors or decreased because of health interventions. It can also reflect Australia's progress and health successes which, in turn, helps to inform what is done in the future.

More recently, the Coronavirus disease 2019 (COVID-19), a viral respiratory infection, spread across the world, causing a major national and international health threat. Deaths from COVID-19 worldwide have exceeded 6.2 million (WHO 2022). Practical ways to contain its spread have included travel bans, physical distancing, personal hygiene and, later, immunisation. Restrictions such as lockdowns have had a serious impact on economies and societies worldwide, affecting travel; trade; and the ability to work, attend school and socialise.

The COVID-19 pandemic has had a number of direct and indirect health effects in Australia (AIHW 2021i). These are explored in Chapter 1 'The impact of a new disease: COVID-19 from 2020, 2021 and into 2022', Chapter 2 'Changes in the health of Australians during the COVID-19 period' and Chapter 3 'Changes in Aboriginal and Torres Strait Islander people's use of health services in the early part of the COVID-19 pandemic'.

Box 4.1: Health disparities between different population groups in Australia

Mortality improvements have not been evenly shared among population groups. Disparities remain for population groups, including Aboriginal and Torres Strait Islander people, rural and remote populations, and migrant populations. For example, there is currently a large gap in life expectancy between Indigenous and non-Indigenous Australians, and mortality rates are higher for Indigenous than non-Indigenous Australians for most causes of death.

Between 2016–2020, after accounting for differences in age structures in the two populations, the overall age-standardised mortality rate for Indigenous Australians was almost twice that for non-Indigenous Australians (960 and 522 deaths, respectively per 100,000).

Over the same period, after accounting for differences in age structures in the populations, mortality rates increased as remoteness increased. Australians living in *Very remote* areas had a mortality rate that was 1.5 times as high as for Australians living in *Major cities*.

Australia's overseas-born population accounted for 33% of deaths registered in 2020 (53,845 deaths), despite making up 30% of the resident population in 2020. This reflects the older age structure of the overseas-born population (median age of 44 in 2020) compared with that of the Australian-born population (median age of 34) (ABS 2021d). When the older age structure of the overseas-born population is taken into account, migrants generally have lower death rates than the Australian-born population (ABS 2021c).

During the COVID-19 pandemic, people who died of COVID-19 with an overseas country of birth had an age-standardised death rate close to 3 times that of people who were born in Australia (6.8 versus 2.3 deaths per 100,000 population) (ABS 2022).

On average, Australian females experience different health outcomes than Australian males. Females have a higher life expectancy than males and are more likely to have multiple chronic conditions (AIHW 2019).

It is acknowledged that some health improvements have not been evident in all population groups in Australia to the same extent, or in the same time frames; however, data on population group health disparities are out of scope for this article. See the 'Health of population groups' and 'Indigenous health' domains for more information: https://www.aihw.gov.au/reports-data/australias-health/australias-health-snapshots.

Over time, the quality of information has improved, and changes in cause of death coding practices will have had an impact on the information reported in this article.

Far fewer infant, child and maternal deaths

Increases in life expectancy in Australia are largely related to the substantial decrease in child and infant mortality (deaths in live born babies up to 1 year) that occurred in the first half of the 20th century. Infant mortality rates were very high in the early 1900s (68 deaths per 1,000 live births in 1915) but declined markedly over the rest of the century. By 1955, the infant mortality rate had fallen to 22 deaths per 1,000 live births (a 67% decline from the early 1900s); it then fell to 5.2 in 2000 (a 92% decline). This fall was largely due to improved medical technology and neonatal intensive care, as well as to education campaigns and immunisation. A national campaign launched in the 1990s increased public awareness of sudden infant death syndrome (SIDS), where the sleeping position of infants was one of the preventable risk factors. This contributed even further to the overall decline of infant mortality in Australia which, today, remains low (3.2 deaths per 1,000 live births in 2020) (Figure 4.1).

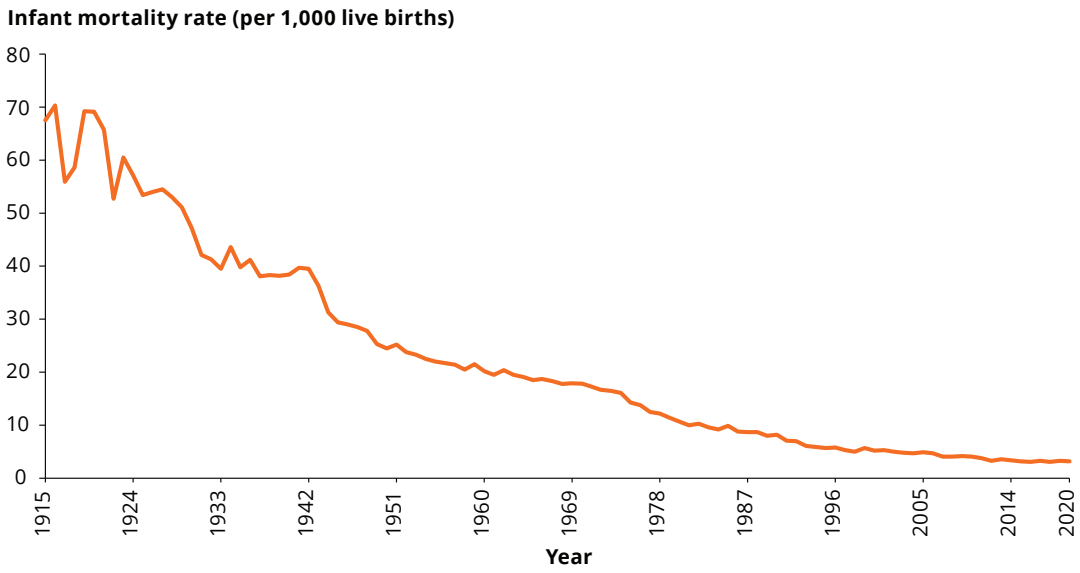
In the first decade of the 20th century, 1 in 10 children died before the age of 5 (or 26% of all deaths), most from infections such as diarrhoeal diseases and enteritis (Cumpston 1989). By 1931, the childhood mortality rate had been halved, with a dramatic decline in deaths from gastrointestinal diseases.

The mortality rate from diarrhoea in children aged 0–4 fell from around 700 per 100,000 population for boys and 580 for girls at the start of the century to under 100 per 100,000 for both sexes by 1935. This decline was linked to improvements in public sanitation and in the quality of drinking water and milk supplies, an increase in breastfeeding, and better health education.

In the 1940s, the availability of vaccines and the use of antibiotics contributed to further declines (Gandevia 1978). By the 1950s, state and local health departments had made substantial progress in food technology and prevention. This included refrigeration and pasteurisation, food safety inspection, and public education about hygienic food storage and handling practices. These improvements all contributed to the decline in foodborne diseases (Gruszin et al. 2012).

Today, there are very few deaths from diarrhoeal diseases and enteritis in Australia. In 2020, 0.7% of all deaths were among children aged under 5, and the child mortality rate was 71 deaths per 100,000 (a decline from 2,412 per 100,000 in 1907).

Figure 4.1: Decline in infant mortality rate (per 1,000 live births), 1915–2020



Note: Births are used in calculating infant mortality rates. There were fewer births registered in 2020 than in recent years.

Sources: ABS 2021a; AIHW 2006; AIHW National Mortality Database.

As well as improvements in infant and child mortality, there has been a dramatic decline in mortality rates in Australia for women during pregnancy, birth or in the period soon afterwards. Maternal deaths were responsible for around 600 deaths per 100,000 live births in the early 1900s. Post-partum infection was responsible for about one-third of these deaths (Cumpston 1989).

Maternal death rates remained relatively high until 1937 then there was a rapid decline: antibacterial drugs became available (Taylor et al. 1998). Over the 20th century, improved nutrition, antenatal and postnatal care, the advent of medical interventions such as antiseptic procedures, a decrease in pregnancies (as a result of contraception and family planning), use of blood transfusions, and training of birth attendants have all contributed to a sustained decrease in maternal deaths (Stanley 2001; Weil and Fernandez 1999).

Today, maternal deaths occur infrequently in Australia (fewer than 9 deaths per 100,000 women who gave birth between 2010 and 2019). Over this period, the main causes of direct and indirect maternal deaths included sepsis, cardiovascular disease, thromboembolism, suicide and non-obstetric haemorrhage (AIHW 2021g).

Box 4.2: Crude rates versus age-standardised rates – assessing changing patterns of mortality over time

A fundamental aim of disease and mortality surveillance is to determine whether levels of mortality are rising or falling over time, or whether they differ between population groups. Numbers alone are insufficient to measure differences because they do not account for population size. Rates, on the other hand, are measures that are scaled to the size of the population.

The simplest rate is the crude rate. For deaths, this reflects the number of deaths in a year divided by the size of the population being measured (and typically multiplied by 100,000). It is an average death rate for the whole population, without taking into account any factors that influence mortality.

The risk of disease and dying varies with many factors, but predominantly with age. A population that has, for example, a larger proportion of older people will experience more deaths than a younger population. Consequently, the usefulness of the crude rate is limited as it does not account for differences in the age composition of the populations being compared, or for changes in the age composition that occur over time.

A statistical method called age-standardisation is used to adjust for these age variations. This method imposes a common (standard) age structure on the populations being compared. The resulting rates reflect those that would have occurred if each population being compared had the same age structure as the standard population, thereby allowing rates to be compared on an equal age basis. In this article, changes in age-standardised mortality rates indicate that factors other than age are contributing to an increase or decrease in deaths in Australia over time.

This article predominantly uses age-standardised rates to report on mortality over time. However, there are limitations to age-standardisation, particularly when the age distribution of the chosen population differs greatly from that of the standard population. It is also important to note that age-standardised rates do not always correspond with the actual rate of mortality at the time. For example, the crude mortality rate from cancer has been steadily increasing in recent decades, but the age-standardised mortality rates have been steadily falling. For this reason, crude rates are also presented in some sections of this article and in the supplementary tables.

Control of infectious diseases

During the first half of the 20th century, infectious diseases predominated as causes of death. Diarrhoeal diseases, tuberculosis, diphtheria, scarlet fever, whooping cough, smallpox and measles were major health concerns. Clean water, improved sanitation and housing conditions, immunisation programs and antimicrobial drugs helped to control these diseases (AIHW 2000; Davis and George 1988). Advancements in science and widespread education also played major roles in their control (Tognotti 2013). Public trust was gained through regular, effective communications that balanced the risks and benefits of public health interventions.

In the following paragraphs, infectious diseases refer to International Classification of Diseases, 10th revision (ICD-10) codes A00–B99. These include conditions such as tuberculosis, polio, smallpox, hepatitis and sexually transmitted diseases such as syphilis and human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS). The category does not include influenza, which is reported on separately in a following section.

From 1907 to 1930, the age-standardised mortality rates from infectious diseases fell by 66% (from 320 to 110 deaths per 100,000 population) and life expectancy at birth rose from age 55 to 64 for males and age 59 to 67 for females (AIHW 2022a).

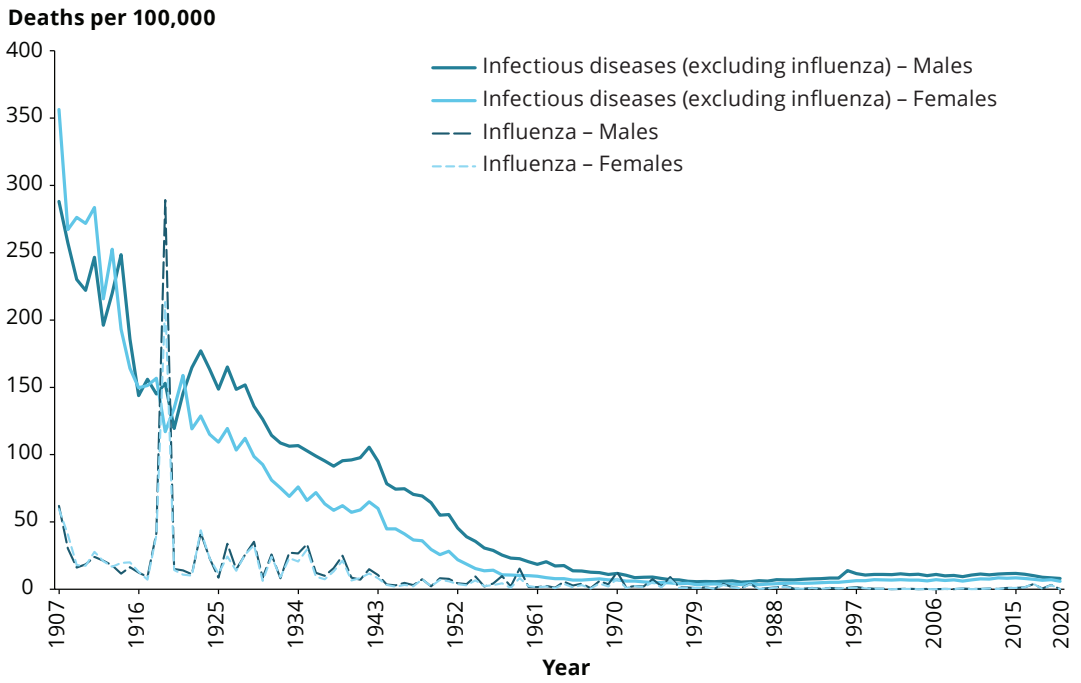
In subsequent decades, from 1931 to 1980, the mortality rate from infectious diseases continued to fall, from 98 to 4.7 deaths per 100,000 population. The mortality rate rose slightly in 1996, to around 9.7 per 100,000, with increases in deaths from HIV/AIDS and hepatitis (Figure 4.2). It fell to between 7.6 and 10 deaths per 100,000 from 1997 to 2019, and to 6.9 in 2020.

There was an overall decline of 98% in the age-standardised mortality rate from infectious diseases between 1907 and 2020.

Influenza

Influenza is a contagious respiratory disease that causes seasonal epidemics in Australia. It spreads from person to person through droplets formed when an infected person coughs, sneezes or talks. Influenza was responsible for many deaths during the 20th century. The greatest number occurred during the Spanish influenza pandemic of 1918–1919, when 12,000 Australians died from a population of 5 million (age-standardised rate of 252 deaths per 100,000) in 1919. After that, influenza deaths declined (to 25 per 100,000 in 1931) and remained low in the second half of the 20th century (fewer than 2 per 100,000 in the 1990s). There was a spike in influenza deaths in 2017 (4.0 per 100,000) due to increased cases and mutation of the influenza virus, which became resistant to the flu vaccine available at the time (Figure 4.2).

Figure 4.2: Age-standardised mortality rates (per 100,000 population) from infectious diseases and influenza (includes 'Spanish flu'), by sex, 1907–2020



Note: Infectious diseases are coded to ICD-10 codes A00–B99. They include conditions such as tuberculosis, polio, smallpox, hepatitis, sexually transmitted diseases such as syphilis and HIV/AIDS, other bacterial diseases and viral infections. Excludes influenza (and 'Spanish flu'). Influenza is coded to ICD-10 codes J09–J11.

Source: AIHW National Mortality Database.

Infectious diseases and influenza during the COVID-19 pandemic

During the COVID-19 pandemic, the mortality rate from infectious diseases has remained low. Deaths from influenza declined dramatically in 2020, likely due to the public health measures put in place to prevent the spread of COVID-19 (such as increased personal hygiene and social distancing). In 2020, 55 people died from influenza compared with 1,080 in 2019 (ABS 2021b).

For more analyses of the impact of COVID-19 on mortality rates in Australia, see Chapter 1 'The impact of a new disease: COVID-19 from 2020, 2021 and into 2022' and Chapter 2 'Changes in the health of Australians during the COVID-19 period'.

Examples of infectious diseases are provided in the following sections to explore mortality improvements seen in Australia.

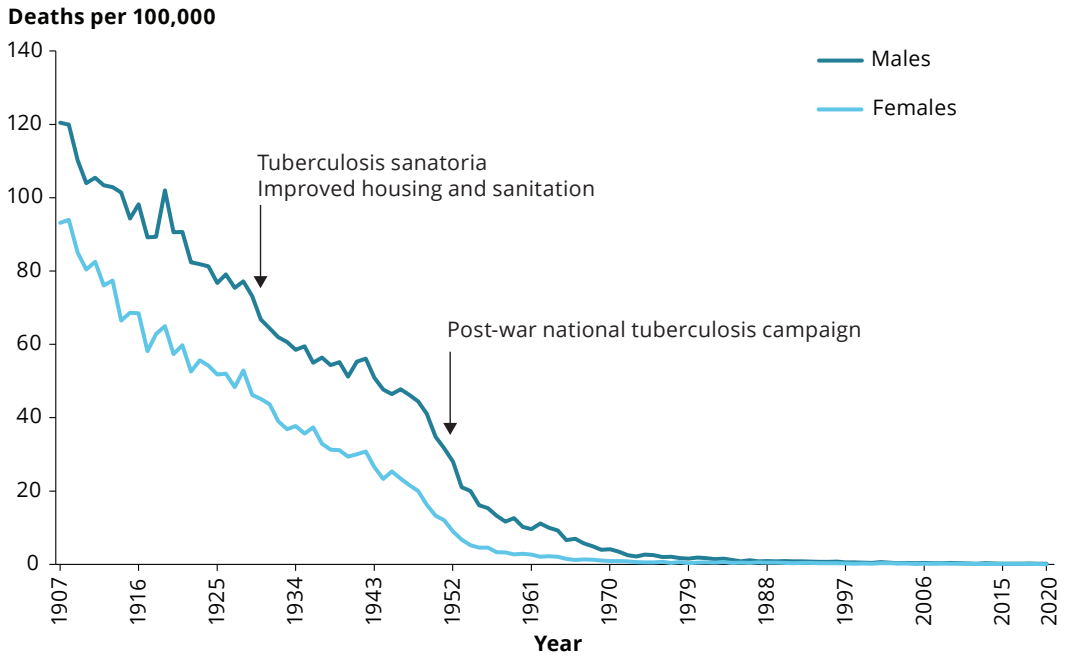
Tuberculosis

Tuberculosis is a contagious bacterial disease that especially affects the lungs, causing fever-like symptoms and destruction of lung tissue. It can also spread to other parts of the body, causing secondary problems and often death if not treated. At the start of the 20th century, tuberculosis was the leading cause of death among females, and the second leading cause of death among males (after heart disease). In 1907, age-standardised mortality rates were 121 per 100,000 population for males, and 93 per 100,000 for females (Figure 4.3).

The rates fell markedly over the century. By the 1980s, deaths from tuberculosis had been virtually eliminated in Australia, with 1 death per 100,000 population. Nowadays, instances of tuberculosis mainly occur in migrant populations and in people with immunity-depressing conditions such as HIV/AIDS. At the end of the century, Australia had one of the lowest rates of tuberculosis infection in the world.

The substantial decline in the mortality rate from tuberculosis was attributed to improved sanitation and housing, tuberculosis sanatoria (establishments for the isolation, treatment and convalescence of people with tuberculosis), effective treatment with antibiotics and the success of the national tuberculosis campaign after World War II, which included immunisation and mass chest X-ray screening (AIHW 2006).

Figure 4.3: Age-standardised mortality rates (per 100,000 population) from tuberculosis, by sex, 1907–2020



Source: AIHW National Mortality Database.

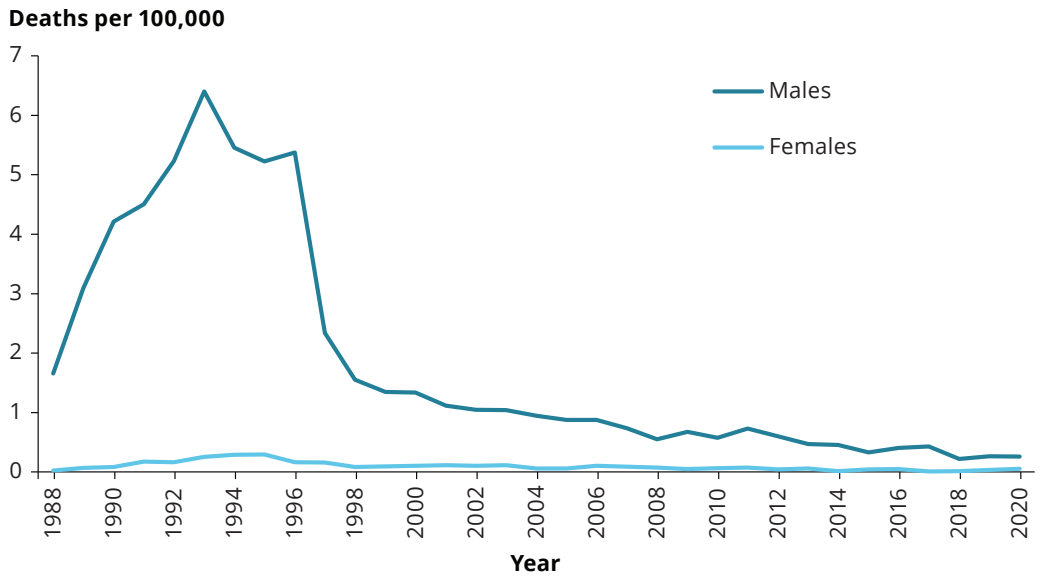
HIV/AIDS

HIV is the virus that causes AIDS. First identified in 1981, HIV became a global epidemic. Between 1996 and 2001, more than 3 million people were infected with HIV every year (Roser & Ritchie 2018). AIDS-related deaths increased throughout the 1990s and reached a peak in 2004–2005 when, in both years, close to 2 million people died worldwide (Danforth et al. 2017).

HIV impairs a person's immunity, making them susceptible to other infections. In Australia, the majority of HIV/AIDS cases occurred in men who have sex with men, with smaller numbers resulting from injecting drugs, contaminated blood or needle stick injury, or heterosexual contact (AIHW 2006; Gruszin et al. 2012).

In Australia, HIV/AIDS was controlled with public health intervention and effective community action (Gruszin et al. 2012). Interventions included safe sex and safer injecting campaigns, screening of blood donors and the blood supply, infection control guidelines and the introduction of antiretroviral treatments from 1996. The age-standardised mortality rate peaked in Australia at 6.4 deaths per 100,000 males in 1993, but slowed substantially after 1994. By 2005, mortality rates from HIV/AIDS had fallen to less than 1 death per 100,000 population for males (Figure 4.4). These falls are evident across the age groups.

Figure 4.4: Age-standardised mortality rates (per 100,000 population) from HIV/AIDS, by sex, 1988–2020



Source: AIHW National Mortality Database.

Recent emergence of new viruses (SARS, COVID-19)

In the early years of the 21st century, the appearance of 'avian flu' and SARS (severe acute respiratory syndrome) attracted worldwide attention, and a fear that some viruses might adapt and mutate to allow human-to-human transmission. In 2020–2021, the worldwide transmission of the SARS 2 (severe acute respiratory syndrome coronavirus 2, or SARS-CoV-2) virus strain caused the COVID-19 pandemic.

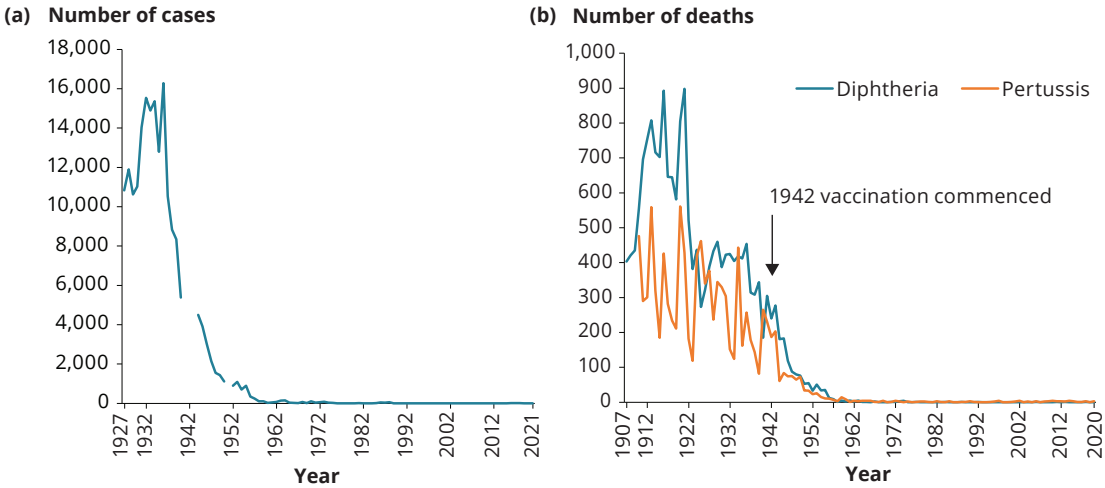
There have been a number of direct and indirect health impacts as a result of the pandemic and the restrictions put in place, which have affected many aspects of daily life (see Chapter 1 'The impact of a new disease: COVID-19 from 2020, 2021 and into 2022' and Chapter 2 'Changes in the health of Australians during the COVID-19 period'; AIHW 2021g). Emergence of these recent infectious diseases illustrate the unpredictability of disease outbreaks and new infective agents.

Role of vaccination

Since World War II, Australia has experienced advances in immunology; the eradication of smallpox; the near eradication of poliomyelitis; and control of diphtheria, pertussis, tetanus, measles, mumps, rubella and, more recently, hepatitis B.

For example, in the decades between the world wars, diphtheria and pertussis vaccines were produced and national school-based vaccinations began. Subsequently, the incidence and deaths from these respiratory diseases declined dramatically (Figure 4.5).

Figure 4.5: Number of cases for diphtheria, 1927–2021 (a) and number of deaths from diphtheria and pertussis, 1907–2020 (b)



Notes

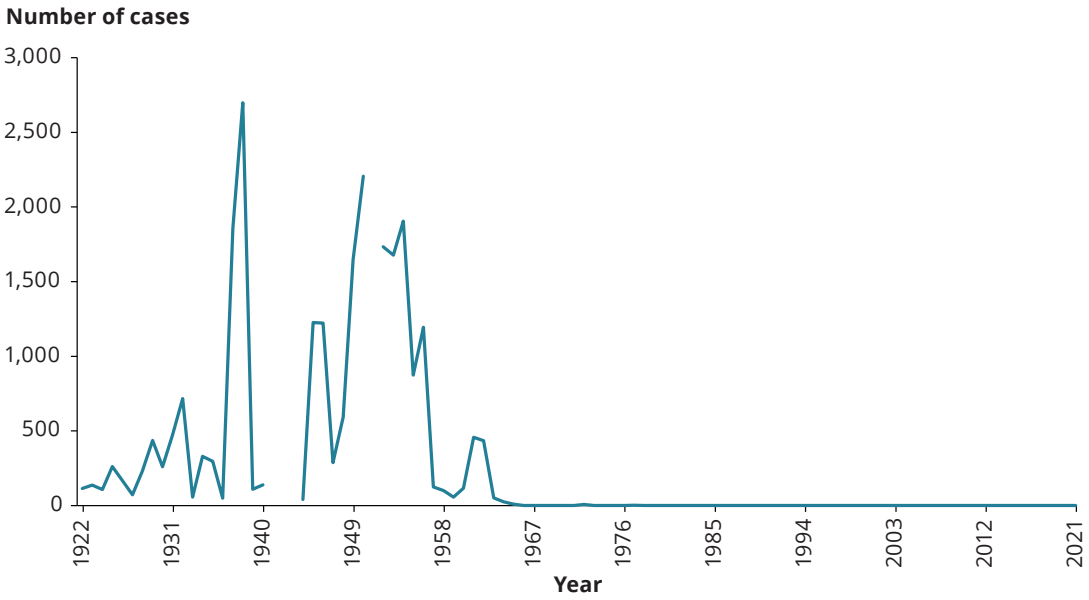
1. Cases are notified nationally and provided to the Australian Government's National Notifiable Diseases Surveillance System (NNDSS). National notifications of pertussis were incomplete before 1990; hence, a long-term trend cannot be presented.
2. Notification data for diphtheria were not available for 1941, 1943 and 1951.

Sources: AIHW analysis of NNDSS data; Hall 1993.

Source: AIHW National Mortality Database.

Also of note were the introduction of polio vaccines in 1956 by Salk and in 1966 by Sabin, followed by mass immunisation programs (Gruszin et al. 2012). With the ongoing immunisation of young children, poliomyelitis (polio) was eradicated in Australia towards the end of the century (Figure 4.6).

Figure 4.6: Number of cases for polio, 1922–2021

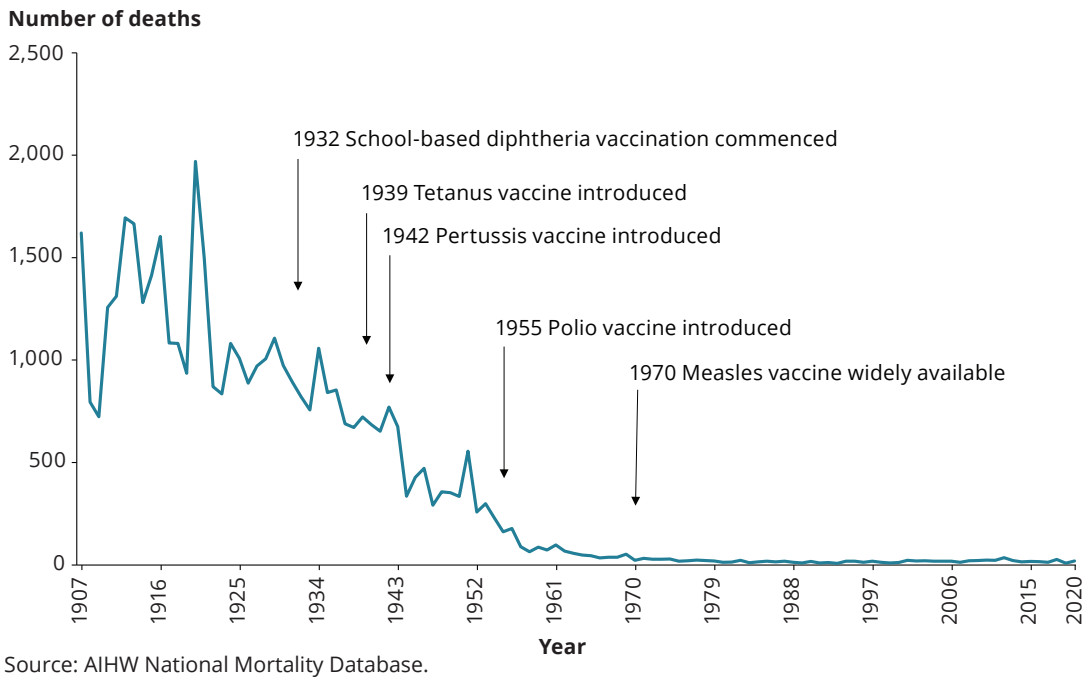


Note: Notification data for polio were not available for 1941, 1943 and 1951.

Sources: AIHW analysis of NNDSS data; Hall 1993.

The introduction of vaccines led to declining deaths in the last century (Figure 4.7). The vaccines for measles, mumps and rubella were developed in the 1960s and became widely available in the following decade. Between 1907 and 1916, there were 2,143 deaths from measles, but only 2 deaths between 2011 and 2020. As measles is highly infectious, maintaining its elimination requires very high vaccine coverage (93% or more). Australia has achieved this coverage through the National Immunisation Program (93% at 2 years of age in 2021).

Figure 4.7: Deaths from vaccine-preventable diseases – diphtheria, tetanus, pertussis, polio, measles, 1907–2020



Source: AIHW National Mortality Database.

Today, Australia is widely regarded as having one of the most robust and comprehensive immunisation systems in the world. This is attributed to the National Immunisation Program, a partnership between Australian and state and territory governments, which provides free vaccines against 17 diseases (including shingles) for eligible people. Fully immunised status is measured at ages 1, 2 and 5 and means that a child has received all the scheduled vaccinations appropriate for their age (Table 4.1).

Table 4.1: Vaccination coverage estimates (per cent) for children at age 1, 2 and 5 in Australia, 2021

Vaccine/antigen	1-year-olds	2-year-olds	5-year-olds
DTP (Diphtheria/tetanus/whooping cough)	95.00	93.71	95.18
Hepatitis B	95.03	96.78	. .
HIB (Haemophilus influenzae type b)	94.96	94.46	. .
IPD (Invasive pneumococcal disease)	96.27	95.74	. .
Meningococcal C	. .	95.69	. .
MMR (Measles/mumps/rubella)	. .	93.89	. .
Polio	94.99	96.78	95.13
Varicella	. .	94.02	. .
Fully immunised[(a)]	**94.61**	**92.60**	**94.98**

(a) The rolling annualised percentage of all children fully immunised by the target age.
Source: National Centre for Immunisation Research and Surveillance online data, updated on 1 April 2022.

Immunisation of young children has increased since the 1990s. The coverage for all recommended vaccines at 2 years of age increased from 74% in 1999 to 93% in 2021. At 5 years of age, coverage for Indigenous children is 97% which exceeds that for children overall (95%). In 2021, the proportion of children fully immunised at 1 year of age was 95% (Table 4.1).

The advent of immunisations has led to the prevention of infectious diseases, and the potential eradication of some. This was a major public health achievement of the 20th century and plays an important role today in the COVID-19 pandemic. As at 27 April 2022, 95% of people aged 16 and over have been fully vaccinated against COVID-19 in Australia (Department of Health 2022).

Shift from infectious diseases to chronic diseases

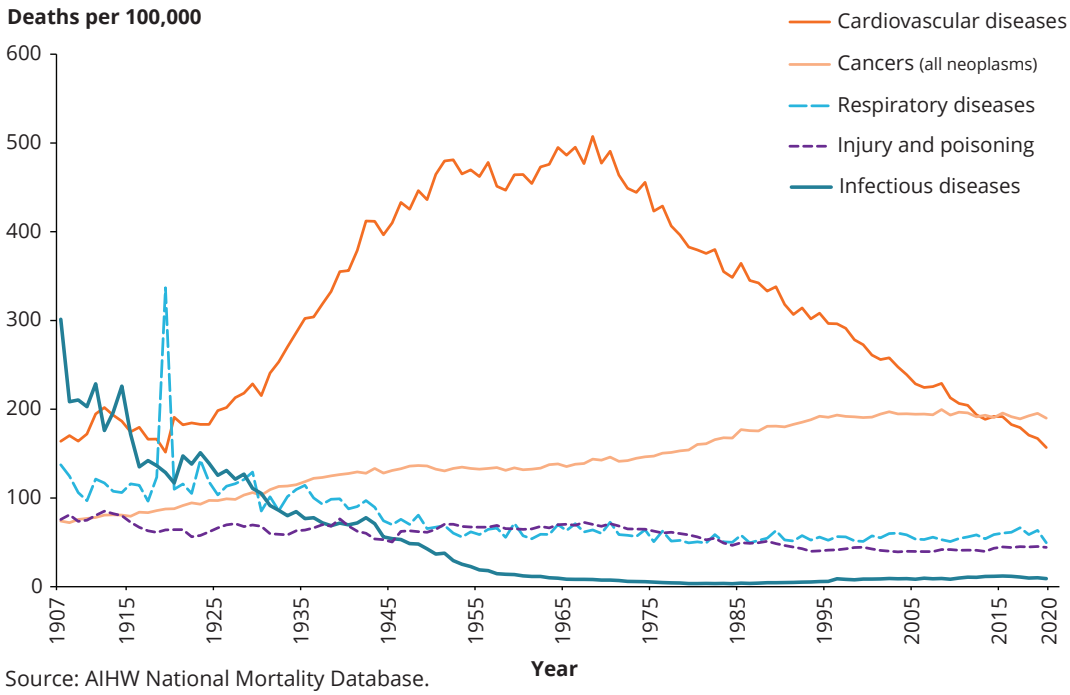
As in many other developed nations, Australia experienced a 'health transition' from infectious to chronic diseases in the mid-20th century, with influenza and tuberculosis being replaced by cardiovascular diseases and cancer as the major causes of death (Beaglehole and Bonita 1997). More specifically, as infectious diseases were coming under control, mortality from cardiovascular diseases and cancers increased from what it was in the 1920s and 1930s.

Since the 1970s, crude mortality rates from cancer have steadily increased while the crude mortality rates from cardiovascular diseases have continued to fall (Figure 4.8a).

Taking into account changes in the age structure of the population over time, cardiovascular diseases were still the major cause of death for most years (Figure 4.8b). Exceptions were the year 1919 – when the Spanish influenza pandemic caused widespread mortality – and from 2010 onwards – when the rate of deaths from cardiovascular diseases dropped below that from cancers, largely due to improvements in cardiovascular disease treatment and management.

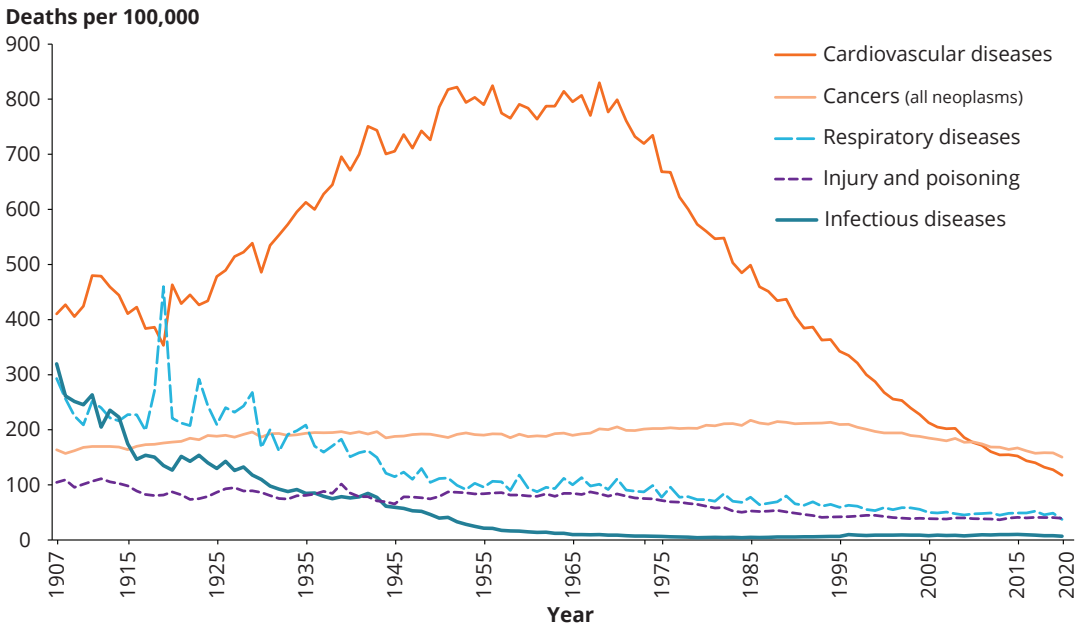
Interestingly, over the last 50 years, crude mortality rates from cancer have steadily increased. However, a different pattern is seen when looking at the age-standardised rates from cancer; age-standardised rates were generally steady between 1970 and 2000 and have decreased since. This suggests changes in the age at death due to cancer over this period.

Figure 4.8a: Crude mortality rates (per 100,000 population), by broad cause of death, 1907–2020



Source: AIHW National Mortality Database.

Figure 4.8b: Age-standardised mortality rates (per 100,000 population), by broad cause of death, 1907–2020



Source: AIHW National Mortality Database.

Age-standardised mortality trends by cancer type show some different patterns over time. For example, stomach cancer was the largest cause of death among cancers in the 1920s, and its mortality rate fell over the century. It is the reverse for lung cancer. Lung cancer mortality rates rose markedly across the century, with a peak in the mid-1980s, after which they began to fall for males.

Later in the 20th century, deaths from prostate cancer increased for males, while the contribution of deaths from cancers of the cervix and uterus fell for females. Mortality rates for bowel cancer (both males and females) and breast cancer (for females) increased in the first half of the century and then fell after national bowel and breast cancer screening programs were introduced. For breast cancer, the mortality rate declined from the 1990s, and for bowel cancer from the 1980s (with larger declines from the early 2000s) – for more detail, see the section 'Impact of screening programs on cancer mortality rates' later in this chapter.

Lung cancer was the leading cause of cancer death in 2020, followed by bowel, pancreatic, prostate and breast cancer. For more information, see *Cancer in Australia 2021* (AIHW 2021d), https://www.aihw.gov.au/reports/cancer/cancer-in-australia-2021/summary.

The observed trends in the age-standardised mortality rates from cancer described in this section could be influenced by multiple factors, such as:

- increased and earlier detection through cancer screening
- changes in risk factor behaviours, such as smoking and dietary risk factors
- data improvements and changes over time, such as changes in mortality coding practices.

Rise and fall of cardiovascular diseases

In the early part of the 20th century, cardiovascular diseases were recognised as substantial contributors to the mortality of Australians. It was the fourth most common cause of death in Australia after pneumonia, tuberculosis, and diarrhoeal disease, and was more common than cancer (Cumpston 1989). By the mid-20th century, cardiovascular diseases accounted for more than half of all deaths, not only in Australia but also in most of the industrialised nations (Braunwald 1997).

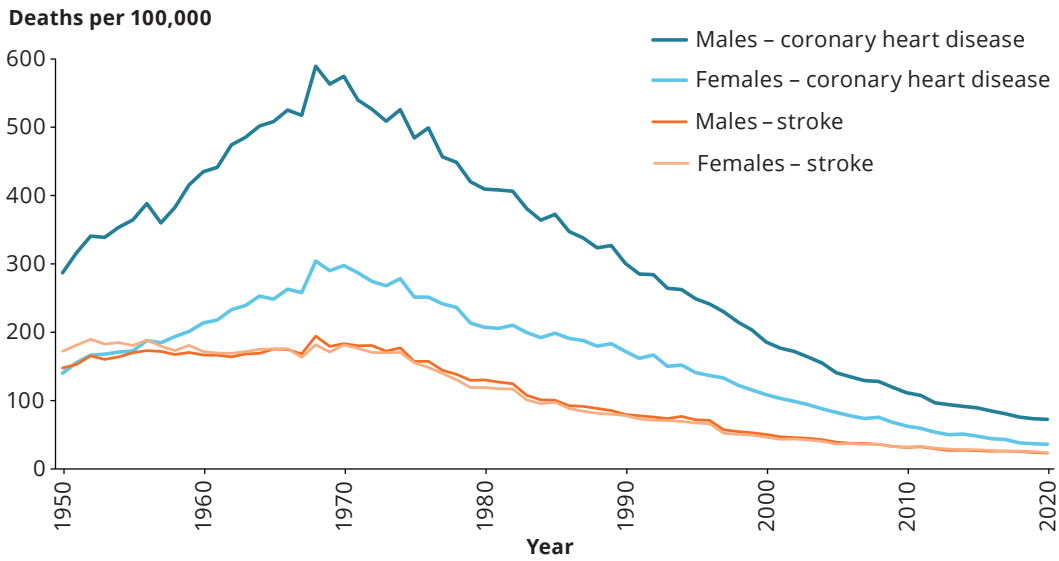
After accounting for changes in the population age structure over time, mortality from cardiovascular diseases rose from 353 deaths per 100,000 population in 1919 to a peak of 830 in 1968. In 1968, coronary heart disease and stroke combined caused 43% of Australian deaths, peaking at a rate of 616 deaths per 100,000. This included 25,522 deaths of people under the age of 75 out of a total 46,624 deaths from these causes

(55%). Due to coding practices, deaths from stroke prior to 1979 were not available. Stroke deaths for these years were estimated using deaths from total cerebrovascular diseases in the following decade.

Age-standardised mortality rates then dropped substantially until the early 2000s (by around two-thirds), after which the rate of decline started to slow (Figure 4.9). By 2020, coronary heart disease and stroke accounted for 15% of all deaths at a rate of 73 deaths per 100,000, with 6,377 deaths (26%) among people aged under 75. The biggest contributor to this trend was coronary heart disease. Mortality from coronary heart disease has fallen dramatically, from a peak of 428 deaths per 100,000 in 1968 to 49 per 100,000 in 2020 – an 89% decline. Despite this improvement, coronary heart disease continued to be Australia's leading cause of death in 2020 and the second leading cause of premature death.

There was also a decline in acute cardiovascular disease outcomes – deaths from acute myocardial infarction fell 93% from 1968 to 2020 (304 deaths per 100,000 population to 19). Deaths from acute rheumatic heart diseases declined by 97%, from a peak in 1936 (3.9 per 100,000) to 2020 (0.1 per 100,000).

Figure 4.9: Age-standardised mortality rates (per 100,000 population) from coronary heart disease and stroke, by sex, 1950–2020



Note: Before 1979, deaths from stroke were not available due to coding practices; for these years, stroke deaths were estimated using the proportion of stroke deaths from overall cerebrovascular disease deaths in the following decade.

Source: AIHW National Mortality Database.

Declining mortality rates for coronary heart disease and stroke have been influenced by improvements in:

- known risk factors (smoking, high cholesterol and dietary risk factors)
- medical interventions, including advancements in pharmaceutical drugs
- diagnosis, and medical and surgical treatments (Ford and Capewell 2011; OECD and The King's Fund 2019).

Despite these gains, in the 21st century, the decline in mortality rates for cardiovascular diseases has slowed. The reason for this is unclear. Possible explanations are plateauing or increases in risk factors, such as the increasing prevalence of overweight/obesity and diabetes; the recent stabilisation of smoking prevalence and blood cholesterol levels after steep declines; and limited improvements in case fatality rates for stroke (Mensah et al. 2017; Shah et al. 2019).

Rise and fall of tobacco use and lung cancer

Tobacco use is the leading cause of preventable diseases and death in Australia, and the major cause of lung cancer deaths.

Tobacco use increased from the early 1900s, reaching a peak in the mid-1960s, when the majority of males (58%), and more than one-quarter of females (28%) aged 16 and over, were current smokers. In the following decades, smoking among men declined, while still having a higher prevalence than for women, and smoking among women continued to increase (Figure 4.11).

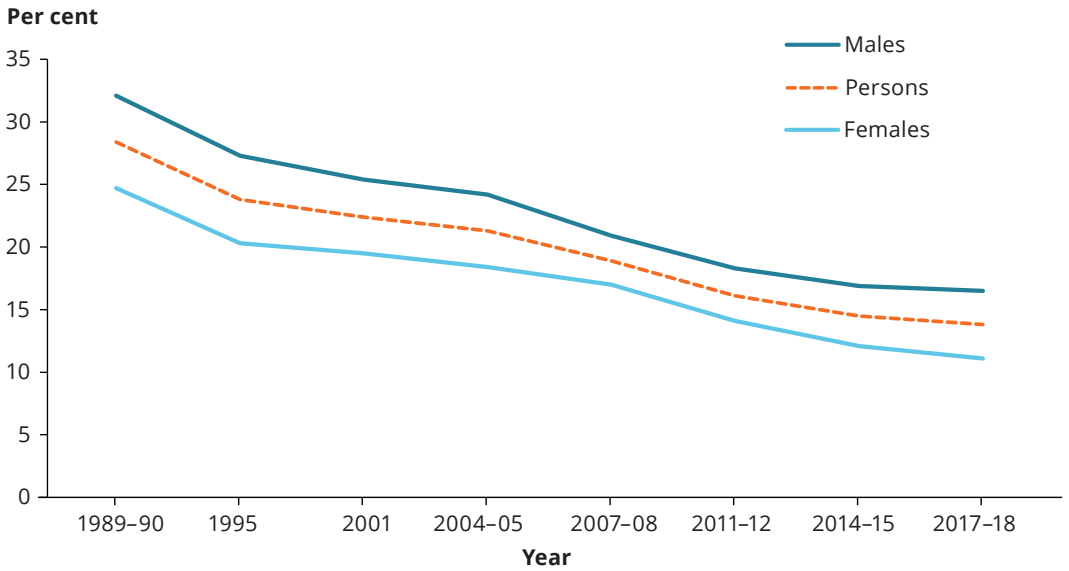
The publication of international reports during the 1960s causally linking tobacco with death and disease stimulated action by Australian health professionals. In the 1970s, advertising bans in the broadcast media were introduced, but were quickly circumvented by the tobacco companies through sport sponsorships (Winstanley and Woodward 1992). However, the 1980s brought increased public awareness about health issues, and legislation on advertising restrictions and other tobacco controls, such as regular increases in tobacco taxes (Scollo and Bayly 2022). Importantly, evidence about the effects of passive smoking also become available in the 1980s, signalling a conflict between public health interests and the tobacco industry.

Legislation and other initiatives to highlight public awareness of the dangers of passive smoking resulted in more public places declared to be free of tobacco smoke. These included workplaces, public spaces and commercial buildings. By 2000, many jurisdictions had controlled exposure to tobacco smoke by regulating against smoking in public buildings, and on public transport, in cinemas, theatres, and, increasingly, in shopping centres and restaurants (Chapman et al. 1999).

The rate of daily smokers has reduced over time, from 28% of adults being daily smokers in 1989–90 to 14% in 2017–18 (Figure 4.10). Today, although the rates of consumption and heart and stroke disease are falling, priority areas for action remain. In 2018, tobacco use contributed to 39% of the total burden from respiratory diseases and 22% of the total burden from cancers (AIHW 2021b).

The latest data from the National Drug Strategy Household Survey estimated that 12% of adults smoked daily in 2019. This rate has declined from an estimated 13% in 2016 and has halved since 1991 (when it was 25%) (AIHW 2020).

Figure 4.10: Proportion of daily smokers aged 18 and over, by sex, 1989–90 to 2017–18



Notes

1. Trend data are based on when survey data are available.
2. In 2017–18, data from National Health Survey and Survey of Income and Housing have been combined to create a much larger sample, which will allow for a more accurate estimate of smoker status.
3. For 1989–90 and 1995, 'current daily smoker' has been reported using the category 'current smoker'. For those years, the definition of 'current smoker' – regularly smoking one or more cigarettes per day on average – aligns with the definition that has been used for the category 'current daily smoker' from 2001 onwards.

Source: ABS 2019.

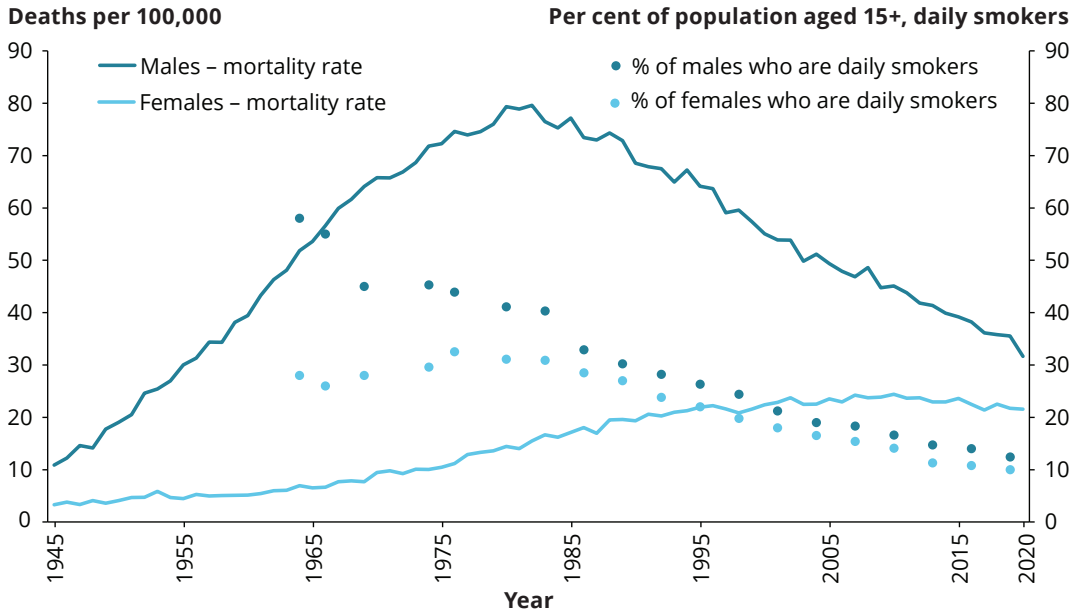
Smoking and lung cancer deaths

Trends in smoking strongly predict lung cancer mortality rates, with a time lag (between exposure to carcinogens in tobacco smoke and the diagnosis of cancer) of 2 to 3 decades (Scollo and Winstanley 2008). Figure 4.11 – which presents age-standardised mortality rates for lung cancer from 1945 to 2020, along with data on smoking prevalence from 1964 to 2019 sourced from the Organisation for Economic Co-operation and Development Health Database (OECD 2021) – shows that the lung cancer mortality rate for males was relatively low in 1945.

It increased sharply in the following years due to an increased uptake of smoking among males in the previous 2 to 3 decades (Scollo and Winstanley 2008), peaking in the early 1980s; it has since fallen markedly, reflecting the steady drop in male smoking rates in the second half of the 20th century (from 58% in 1964 to 12% in 2019). By 2020, the lung cancer mortality rate for males was at the same level as that observed in the mid-1950s.

Females took up smoking later than males and in fewer numbers. As a result, the mortality rates from lung cancer have increased more gradually in females than in males since the mid-1940s. The continued rise in the mortality rates for females over the period may be due to the increased uptake of smoking among females until the mid-1970s, when about 33% of Australian females reported being daily smokers. Since 2010, the female mortality rate from lung cancer has plateaued and more recently begun to decline, compared with what it was in earlier decades. Despite these patterns, the male rate is still 1.5 times as high as the female rate.

Figure 4.11: Age-standardised mortality rates (per 100,000 population) from lung cancer, by sex, 1945–2020, and prevalence of daily smoking, by sex, 1964–2019



Sources: AIHW National Mortality Database; Organisation for Economic Co-operation and Development Health Data 2021.

Impact of screening programs on cancer mortality rates

Three national population-based cancer screening programs were introduced in Australia in the 1990s – BreastScreen Australia and the National Cervical Screening Program in 1991 and the National Bowel Cancer Screening Program in 2006. These programs are run through partnerships between the Australian Government and state and territory governments. The programs aim to reduce illness and death from these cancers through early detection of cancer and pre-cancerous abnormalities, and through effective follow-up treatment. They target specific populations and age groups where evidence shows screening is most effective at reducing cancer-related morbidity and mortality.

These programs have resulted in notable changes in breast, bowel and cervical cancer incidence and mortality rates since their introduction (AIHW 2021d).

Breast cancer

New cases of breast cancer increased rapidly between the 1980s and the late 1990s, which may partly be due to increased detection after the national breast screening program was implemented. The age-standardised incidence rate levelled off at 111 cases per 100,000 women by 2007 and has remained stable since (AIHW 2021d).

Age-standardised breast cancer mortality rates increased between the early 1900s and 1940s, after which they stabilised until the early 1990s. Thereafter, there were substantial reductions in these mortality rates: they fell by almost 40%, from 31 deaths per 100,000 women in 1991 to 19 per 100,000 in 2020 (Figure 4.12a).

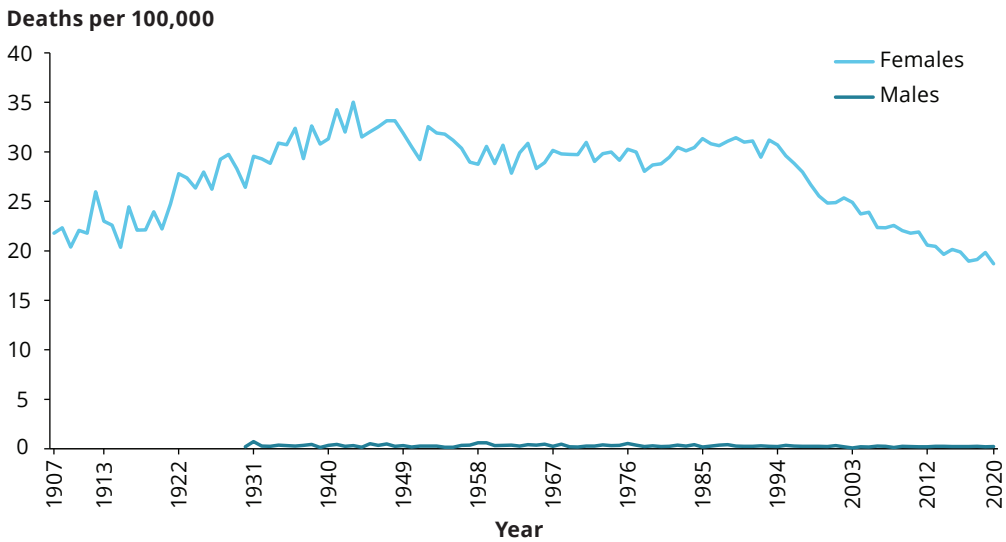
Bowel cancer

Incidence of bowel cancer (which comprises cancers of the colon and the rectum) rose by 14% between 1982 and 2001 (from 58 to 66 cases per 100,000 population) and then declined gradually to 51 cases per 100,000 in 2020 (AIHW 2021d). Age-standardised bowel cancer mortality rates increased for males and decreased slightly for females between 1968 and the early 1980s. They fell by 19% (32 to 26 deaths per 100,000) from 1982 to 2000, before continuing to decline from 26 per 100,000 in 2001 to 17 in 2020 (36% decline) (Figure 4.12b).

The strong declines in both bowel cancer incidence and mortality since 2001 are likely to reflect, to some extent, the success of the National Bowel Cancer Screening Program, which actively recruits and screens the target population for early detection and treatment.

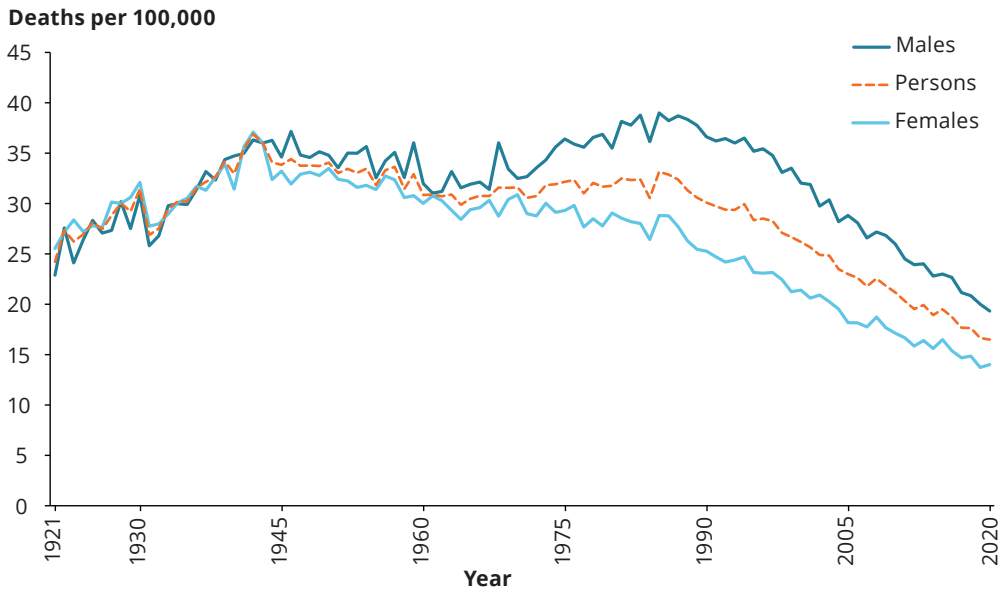
Figure 4.12: Age-standardised mortality rates (per 100,000 population) from breast cancer (a) and bowel cancer (b), by sex, 1907–2020

(a) Breast cancer



Note: Data for male deaths from breast cancer are not available before 1930.
Source: AIHW National Mortality Database.

(b) Bowel cancer



Note: There was a change in coding practice for deaths from bowel cancer. Since 1968, the equivalent ICD codes to ICD-10 C26.0 are included where the specific site of the cancer is not known and combined with C18–C20. Before 1968, equivalent ICD codes to ICD-10 C18–C21 were used to give an approximate trend of bowel cancer deaths.

Source: AIHW National Mortality Database.

Cervical cancer

A decrease was observed for both incidence and mortality from cervical cancer. Between 1982 and 2020, the rate of new cases dropped by more than half – from 14 to 6.9 cases per 100,000 women (AIHW 2021d). The age-standardised rate of deaths dropped to 1.6 per 100,000 women – about one-third of the rate when the National Cervical Screening Program began in 1991 (when it was 4.0 per 100,000).

The introduction of a national human papilloma virus (HPV) vaccination program in April 2007 and organised screening are likely to have contributed to the mortality decline and are expected to continue to lead to further reductions in cervical cancer incidence and mortality in the future (Hall et al. 2019). A renewed national cervical screening program began on 1 December 2017 and uses an HPV test as its primary screening test (Hall et al. 2019).

Preventing injury

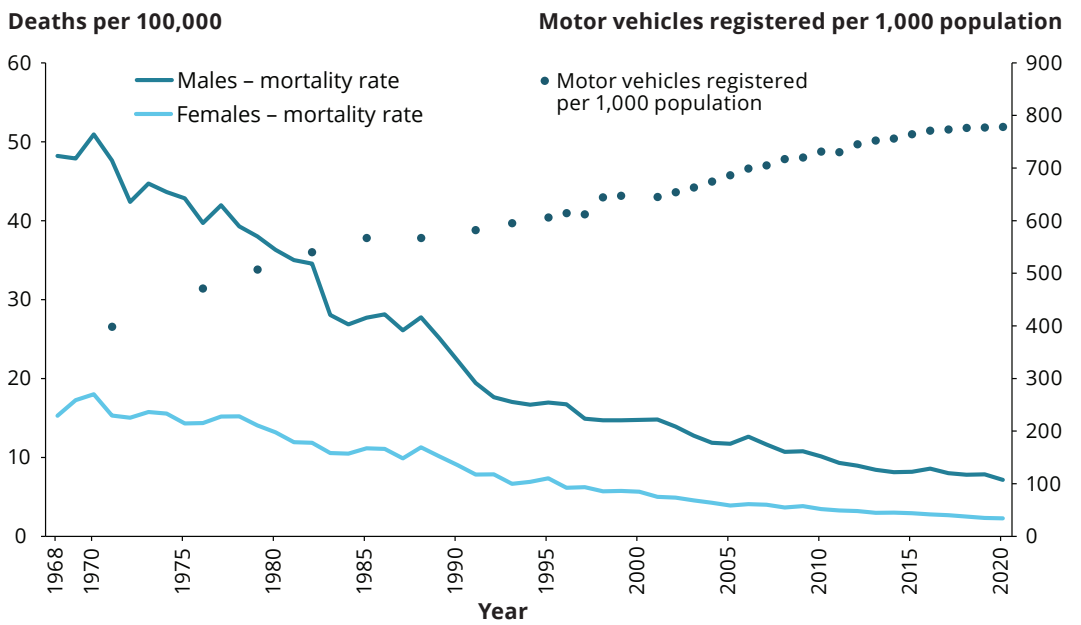
Accidental deaths were relatively common in the early part of the 20th century with drowning, burns, falls, work-related injuries and accidents with horses being the most common contributors to mortality rates (Gordon 1976). Deaths from accidents have always tended to occur more frequently among the younger age groups. In 1925, external causes were the leading cause of death (26%) for people aged 15–24 (Cumpston 1989). This pattern still applies today, particularly to deaths from motor vehicle accidents. Drowning (most commonly in swimming pools) also remains a major cause of injury deaths for children aged 1–4.

Rise and fall of deaths from road traffic accidents

The introduction of motor vehicles at the start of the 20th century had advantages for trade and more rapid transport; however, it has also resulted in a substantial number of deaths as well as disability. Road deaths represented a large proportion of injury deaths in the 1950s and 1960s.

From a peak in 1970 of 51 deaths per 100,000 males and 18 per 100,000 females, age-standardised mortality rates for road accidents fell substantially. In 2000, they were 15 and 5.6 per 100,000 for males and females, respectively. They continued to decline in the 21st century, to 7.2 and 2.3 for males and females, respectively in 2020 (Figure 4.13).

Figure 4.13: Age-standardised mortality rates (per 100,000 population) from land transport accidents, by sex, 1968–2020; motor vehicles on register per 1,000 population, 1971–2020



Sources: ABS Motor Vehicle Census, Australia 1976–2020; AIHW National Mortality Database.

The declines in motor vehicle related mortality rates, especially over the last third of the 20th century, were attributed to government policies, and leadership for motor vehicle safety. Motor vehicle safety programs succeeded through the combined efforts of federal and state governments, academic institutions, community-based organisations and industry – working together to improve the public's health. Improvements in technology and design of motor vehicles contributed to advances in road and car safety, such as seat belts, airbags, anti-lock braking systems, stability and traction control, child seat anchorage and rear-view cameras (ANCAP Safety 2022).

Successful public health measures have greatly improved road and motor vehicle safety over the last 40 years. They have included:

- compulsory seat belts from the 1970s and enforced mandatory wearing of seat belts
- mandatory wearing of motorcycle helmets and bike helmets
- baby capsules and improved occupant restraints in motor vehicles
- reductions in road speed limits
- setting and monitoring blood alcohol limits (for example, via random breath testing)
- road safety campaigns (Delaney et al. 2004).

Changes in suicide rates

Suicide has one of the highest average years of life lost each year from all leading causes of death in Australia (AIHW 2021j). Of the 3,318 people who died from suicide in 2019, on average, each lost an estimated 42 years of life. This average was much higher than years of life lost from other common causes of death, such as coronary heart disease (12 years of life lost), dementia (7 years) and lung cancer (17 years), and was similar to that for road transport injuries and drug use disorders (43 and 41 years, respectively) (AIHW 2021j).

For most of the century, overall suicide rates have been relatively stable; however, different trends have been evident at various points in time. In 1907, the age-standardised suicide rates were 27 and 5.2 deaths per 100,000 population for males and females, respectively. The peak death rate per 100,000 for males was 30 in 1930, with the lowest rate of 12 recorded in 1944. There were consistently around 20 suicide deaths per 100,000 males for the second half of the century.

Over the last 100 years, the age groups affected by suicide deaths have changed (Figure 4.14). Different trends have emerged for different age groups. Until the mid-1960s, suicide occurred mainly among older age groups; since then, there has been a dramatic shift to younger people. Today, it is the leading cause of death among people aged 15–44. Among people aged 15–24, the rate of suicide trebled between 1960 and 2020, from 6.8 to 21 deaths per 100,000 for males and from 2.0 to 6.7 deaths per 100,000 for females.

For females, the suicide rate remained steady for the first half of the 20th century, at around 5 deaths per 100,000 population. It rose rapidly during the 1960s to a peak of 13 deaths per 100,000 in 1967 but returned to around 5 deaths per 100,000 in the 1980s. In 2020, the female suicide rate was 5.8 deaths per 100,000.

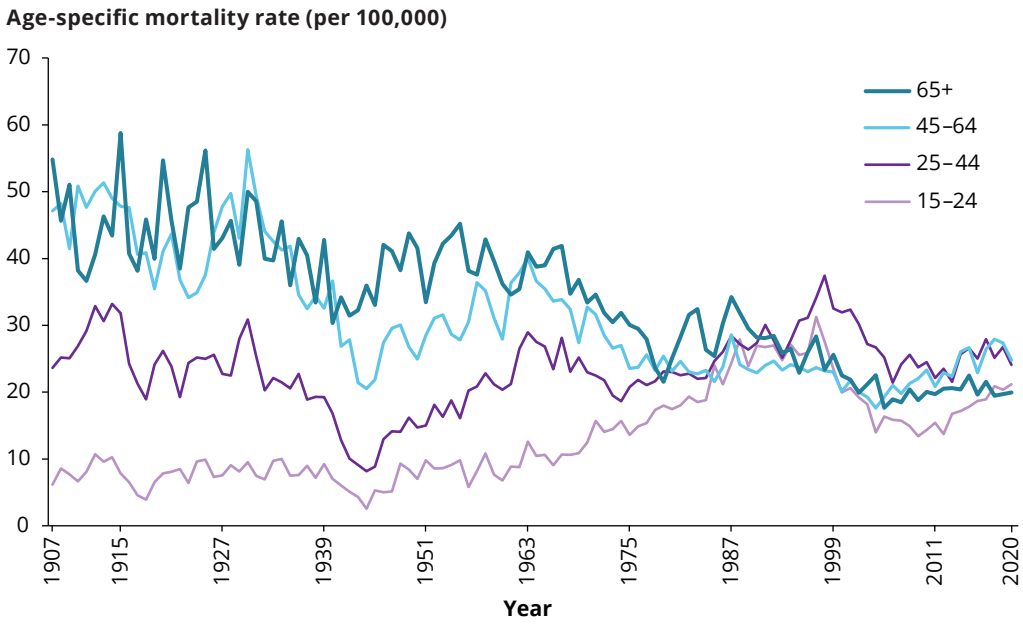
The high suicide rate for males in 1930 occurred during the Great Depression – a period of high unemployment, particularly among males. The rise in both male and female suicide rates in the 1960s has been attributed, in part, to the unrestricted availability of barbiturate sedatives (Oliver and Hetzel 1973; Whitlock 1975). Subsequent falls in the late 1960s and early 1970s have, in turn, been attributed to restrictions on the availability of these drugs, which were introduced in July 1967 (AIHW: Harrison and Henley 2014).

While high rates of suicide in the late 1980s and early 1990s coincided with a period of economic uncertainty in Australia, the social and economic disruption related to the COVID-19 pandemic has not seen an increase in the number of deaths suspected to be by suicide (AIHW 2022b).

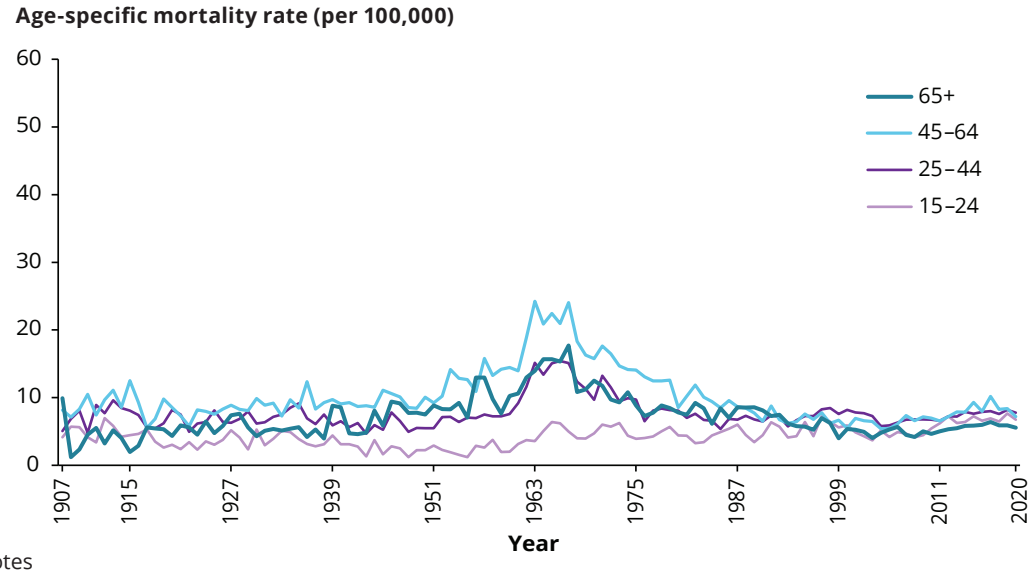
Today, suicide is a continuing public health challenge and it is one of the top 20 causes of death in Australia.

Figure 4.14: Age-specific mortality rate (per 100,000 population) from suicide, by broad age groups, males (a) and females (b), 1907–2020

(a) Males



(b) Females



Notes

1. Deaths of children attributed to suicide can be influenced by coronial reporting practices, and reporting practices may lead to differences in counts across jurisdictions. For more information on issues associated with the compilation of suicide data, see ABS report 3303.0 – Causes of death, Australia, 2018, Explanatory notes 91 to 100.
2. Age-specific mortality rates are the total number of deaths of a specified age group divided by the population of the same age group for the time period, multiplied by 100,000. They are used to provide a crude comparison between age groups.

Source: AIHW National Mortality Database.

High mortality rates in younger males are an ongoing public health concern. In 2000, suicide deaths made up 24% of all deaths for men aged 20–39; in 2019, this increased to 30%. Suicide is complex and thought to result from various biological, environmental and social factors. It could be associated with trauma and stress, potentially from early childhood. It can include wider socioeconomic factors, such as unemployment and low socioeconomic status.

In 2010, the Senate Community Affairs References Committee raised concerns about the accuracy of suicide reporting and about factors that may impede accurate identification and recording of possible suicides. The quality of suicide data has improved with quality assurance activities undertaken (Australian Senate Community Affairs Reference Committee 2010). For detailed and up-to-date data on suicide in Australia, see the AIHW's Suicide and Self-harm Monitoring website, https://www.aihw.gov.au/suicide-self-harm-monitoring/data.

Increase in accidental poisoning deaths from the late 20th century

The age-standardised mortality rate from accidental poisoning increased in the late 20th century – from 1.3 deaths per 100,000 population in 1979 to a peak of 5.7 in 1999. This notable increase in deaths in 1999 coincided with an epidemic of drug poisoning, mainly by opioids (mostly heroin) (AIHW 2015). In the following year (2000), the rate fell by 25% to 4.3 deaths per 100,000 before dropping further – to 2.9 deaths per 100,000 – in 2002 (Figure 4.15).

Between 2002 and 2020, the mortality rate due to accidental poisoning increased by 60% for females (from 2.0 to 3.1 deaths per 100,000 population) and 103% for males (from 3.9 to 7.9 per 100,000) (Figure 4.15). The age-standardised mortality rate for people in 2020 was 5.5 deaths per 100,000 – 7.3 per 100,000 in adults aged 25 and over, and 1.1 in children and young adults aged under 25.

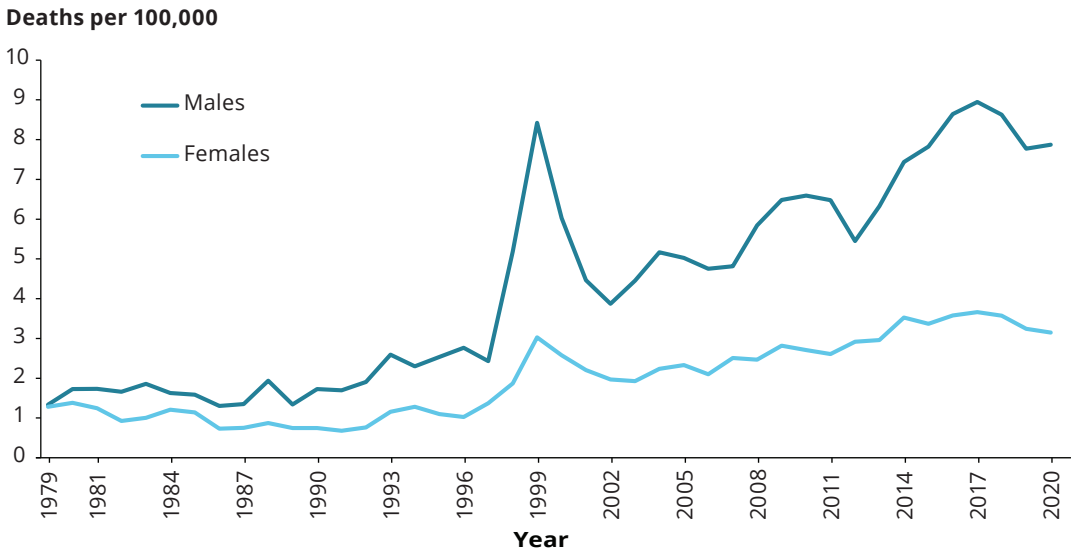
Drug-induced deaths have increased since the start of the 21st century (Figure 12.16). They are defined as those deaths that can be directly attributable to drug use. This includes deaths due to acute toxicity (for example, drug overdose) and chronic use (for example, drug-induced cardiac conditions) (ABS 2021b).

Between 2006 and 2020, the median age at death for drug-induced deaths increased from 41.1 to 44.4 for males and from 46.6 to 48.1 for females. Over the same period, the age-standardised mortality rate increased by 71% for males (from 5.6 to 9.5 deaths per 100,000 population) and by 36% for females, from 3.6 to 4.9 deaths per 100,000 (Figure 4.16).

Drug-induced deaths are more likely to be due to pharmaceutical drugs than illegal drugs, with benzodiazepines being the most commonly involved single drug type in drug-induced deaths (817 deaths in 2020). The rate of deaths where benzodiazepines were present rose from 1.2 deaths per 100,000 population in 2006 to 3.2 per 100,000 in 2020. For synthetic opioids (including fentanyl and tramadol), the mortality rate increased from 0.3 per 100,000 (57 deaths) in 2010 to 0.9 per 100,000 (218 deaths) in 2020.

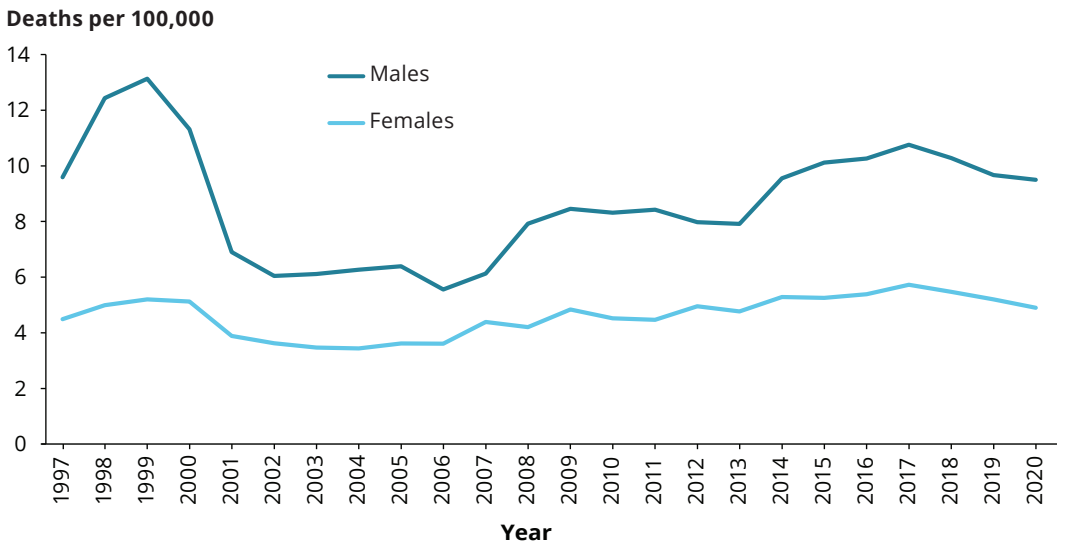
While pharmaceutical drugs caused a higher number of drug-induced deaths than illegal drugs, the number of methamphetamine deaths (including from using the illicit drug ice) has increased rapidly, with the death rate in 2020 being 5 times that in 2006 (increase from 0.4 to 2.1 per 100,000).

Figure 4.15: Age-standardised mortality rates (per 100,000 population) from accidental poisoning, by sex, 1979–2020



Source: AIHW National Mortality Database.

Figure 4.16: Age-standardised mortality rates (per 100,000 population) from drug-induced deaths, by sex, 1997–2020



Source: AIHW National Mortality Database.

While the total number of drug-related (excluding alcohol) hospitalisations remained relatively steady between 2015–16 (63,799 hospitalisations) and 2019–20 (62,757), when population growth and ageing are taken into account, the rate decreased over this period (from 271.5 to 252.8 hospitalisations per 100,000 population) (Chrzanowska et al. 2021; Man et al. 2021).

Individual drugs have contributed differently to this trend in drug-related hospitalisations. In recent years, the number of hospitalisations related to some drug types has increased (AIHW 2021a):

- Cannabinoids-related hospitalisations increased from 6,020 (25.1 per 100,00 population) in 2015–16 to 6,640 (26.0 per 100,000) in 2019–20.
- Methamphetamine-related hospitalisations increased from 9,317 (38.8 per 100,000) in 2015–16 to 14,053 (55.0 per 100,000) in 2019–20.
- Cocaine-related hospitalisations also increased, rising from 776 (3.2 per 100,000) hospitalisations in 2015–16 to 1,275 (5.0 per 100,000) in 2019–20.

Reductions in work-related fatalities

Work-related fatalities made up a substantial proportion of accidental deaths over the 20th century. Working conditions in the earlier part of the century were often dangerous, involving substantial exposure to a range of toxic substances or immediate physical risks.

Modern occupational health and safety legislation was developed in the 1970s. Since then, there have been major reductions in fatalities as a result of changes in industrial, occupational and work-related practices and safety measures. These have included:

- reforms in the mining and related industries to reduce workers' exposure to hazardous substances
- establishment of registries to record information about workers who suffered from certain hazardous exposures and injuries; for example, the Australian Mesothelioma Register, which began in 1980 and was redeveloped into the Australian Mesothelioma Registry in 2010
- National Coronial Information System
- campaigns on a range of issues, such as sun protection on construction sites, or the use of seat belts on forklifts (Gruszin et al. 2012).

Data on workplace fatalities are available from 2003 onwards from Safe Work Australia. The data indicate a slight increase in fatalities between 2003 and 2007, after which there was a 50% decrease in the mortality rate to 1.5 per 100,000 workers in 2020 (2.8 per 100,000 for men and 0.1 for women) (SWA 2021b). Both the number and rate of workers' compensation claims for serious illness and injury have fallen since 2000–01, from 16.3 to 9.9 serious claims per 1,000 employees in 2019–20 (SWA 2021a). In other words, the number of serious claims fell 9.5%, from 133,041 claims in 2000–01 to 120,355 claims in 2019–20 (SWA 2021a).

Today, industry-level standards, acts and regulations govern workplace health and safety. Each state and territory has its principal Occupational Health and Safety Acts. Australia's no-fault compensation schemes support injured workers and promote rehabilitation and a safe return to work.

Exposure to asbestos and mesothelioma

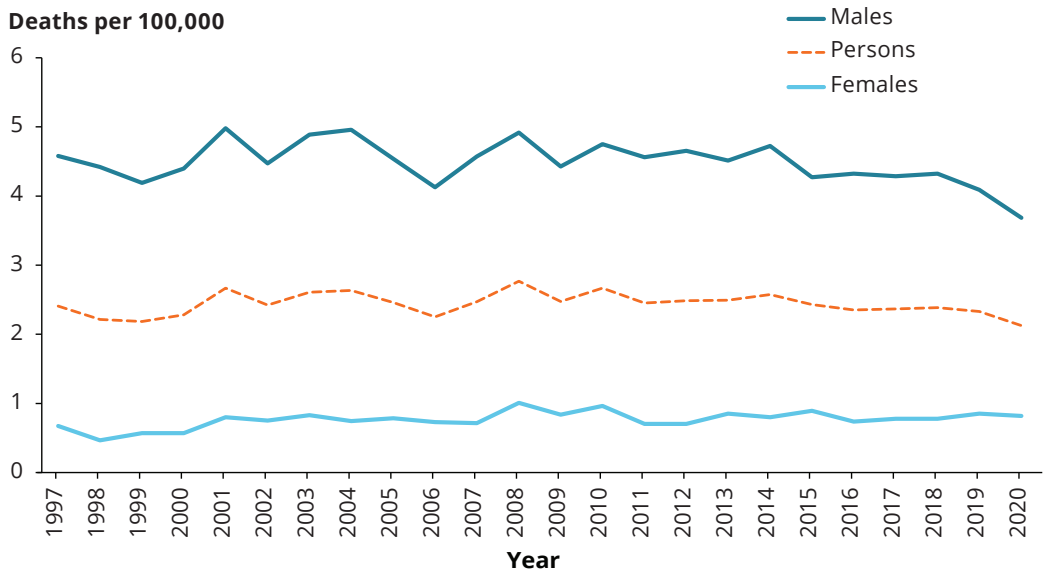
Occupational exposures, including exposure to asbestos, are estimated to be responsible for 15% of lung cancers in males, and air pollution is estimated to be responsible for about 5% of all cases of lung cancer (Giles et al. 1988). Asbestos was used widely throughout Australia by the 1950s and could be found in most homes, cars and workplaces. A substantial asbestos mining industry also existed, exposing workers to large doses of asbestos dust.

In the 1960s, there were growing concerns about the health risks associated with asbestos. Asbestos mining ended in 1983, and asbestos has not been used for new homes since 1990. A complete ban on its importation and use has been in place since 2003; however, asbestos exposure continues in both occupational and non-occupational settings (Soeberg et al. 2018).

Exposure to asbestos is the main cause of mesothelioma. A large amount of asbestos remains in older structures and products, potentially exposing workers and/or the public to asbestos (AIHW 2021h). Australia has one of the highest measured incidence rates of mesothelioma in the world (Bray et al. 2017). Each year in Australia, between 700 and 800 people are diagnosed with this rare and aggressive cancer. Between 1982 and 2019, the number of new cases of mesothelioma reported annually steadily increased (from 135 to 588 for males and from 22 to 138 for females; AIHW 2021h); however, there was little change in the age-standardised rates over this period, suggesting this increase is mainly due to population increase and ageing.

Deaths from mesothelioma followed a similar pattern, with the number of deaths increasing since 1997 to 735 in 2019 and 701 in 2020. While there has been little change in the age-standardised mortality rates over this period (Figure 4.17), there have been some improvements, most notably in the age-adjusted 1-year survival (AIHW 2021h).

Figure 4.17: Age-standardised mortality rates (per 100,000 population) from mesothelioma, by sex, 1997–2020



Source: AIHW National Mortality Database.

Recent rise of dementia as a leading cause of death

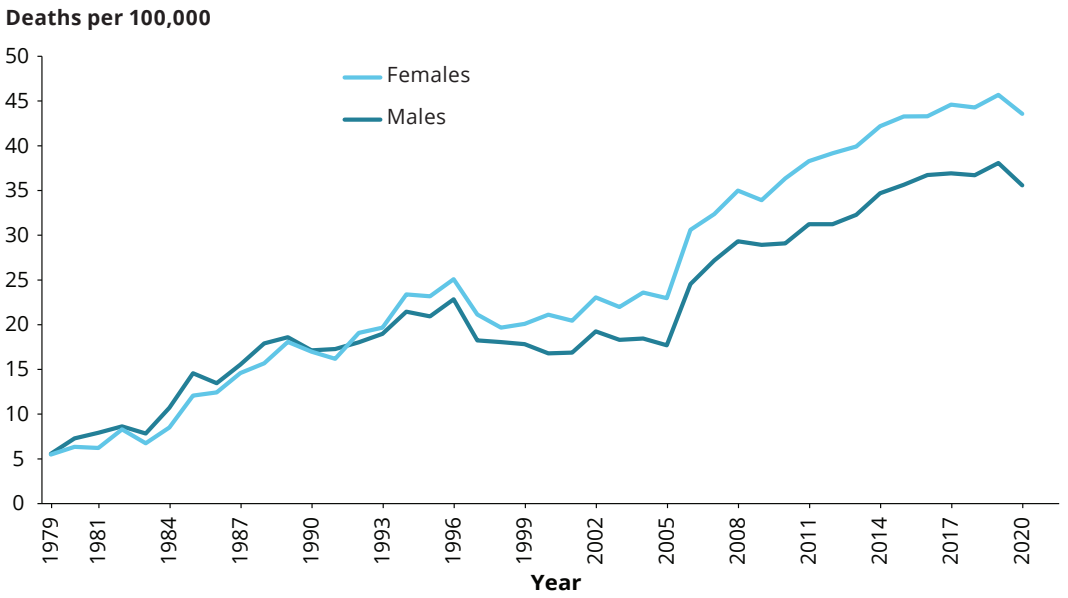
Dementia is a term used to describe a group of similar conditions characterised by gradual impairment of brain function. Changes due to these conditions may affect memory, speech, cognition (thought), behaviour, mobility and an individual's personality. A person's health and functional ability decline as the disease progresses. Alzheimer's disease is a common type of dementia (AIHW 2021f).

The age-standardised rate of deaths due to dementia (including Alzheimer's disease) rose steadily from the early 1980s to 1996 (25 deaths per 100,000 population). Changes to coding practices for dementia in 1997 and 2005 created breaks in the time series. Dementia age-standardised mortality rates then continued to increase by a further 41%, from 29 deaths per 100,000 in 2006 to 40 in 2020 (Figure 4.18), when looking at the underlying cause of death.

Ageing is the biggest risk factor for dementia. In 2020, 14,575 people died due to dementia as the underlying cause of death, and an additional 11,515 people died with dementia listed as an associated cause of death. Today, dementia is the second leading cause of death for men and the leading cause for women. The number of Australians living with dementia - and consequent mortality - is projected to continue to increase, with more Australians living to older ages (ABS 2015).

The number of deaths due to dementia has increased markedly since 1979 for people aged over 85 compared with people aged 60–64 (Figure 4.19). Among people aged 85 and over, the number of deaths from dementia in 2020 was 2.5 times more than that in 2006 (compared with 1.2 and 1.8 times more for people aged 60–64 and 65–69, respectively). This suggests that the increased mortality rate due to dementia is at least partly due to people living longer.

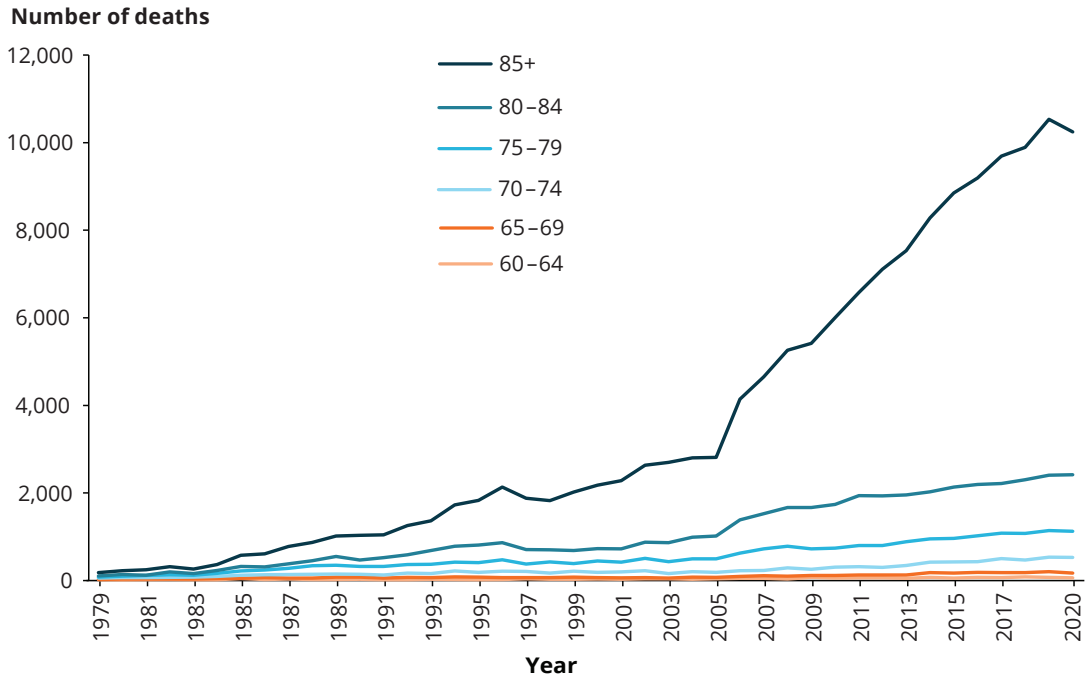
Figure 4.18: Age-standardised mortality rates (per 100,000 population) from dementia (including Alzheimer's disease), by sex, 1979–2020



Note: The number of deaths due to dementia has increased when comparing data before 2006 with data from 2006 onwards. This increase can be attributed to (1) changes in ICD-10 instructions for coding deaths data, which have resulted in assigning some deaths to vascular dementia (F01) that may previously have been coded to cerebrovascular diseases (I60–I69), and (2) legal changes allowing veterans and members of the defence forces to relate death from vascular dementia to relevant service, with an accompanying promotional campaign targeted at health professionals thought to have increased the number of dementia deaths among this group (ABS 2015).

Source: AIHW National Mortality Database.

Figure 4.19: Deaths from dementia (including Alzheimer's disease), by age groups 60–64 to 85 and over, 1979–2020



Source: AIHW National Mortality Database.

Further information and data on dementia can be found at https://www.aihw.gov.au/reports/australias-health/dementia and in the web report *Dementia in Australia* (AIHW 2021f) (see https://www.aihw.gov.au/reports/dementia/dementia-in-aus/contents/about).

Ongoing challenges

As societies evolve, so do the patterns of disease and appropriate strategies for intervention. Improved infectious disease control, and environmental and social conditions all contributed to longevity and reduced burden of disease in the 20th century.

Today, more people are living longer with chronic conditions. Just under half (47%) of Australians had one or more chronic conditions in 2017–18, an increase from 42% of people in 2007–08 (ABS 2018b). This increase is associated with a number of factors, including:

- improvements in the treatment and management of chronic conditions, which extends life expectancy
- social and behavioural risk factors, such as poor diet and physical inactivity (ABS 2018b).

As the prevalence of chronic conditions increases, it is expected that multimorbidity – the presence of 2 or more chronic conditions in a person at the same time – will also become more common (AIHW 2021e). Multimorbidity makes treatment more complex; it can require ongoing management and specialised care across the health system, leading to higher demand for health services and greater economic investment.

A key focus in recent years, therefore, is the prevention and better management of chronic conditions to improve health outcomes; this is reflected in national guidelines and the National Preventive Health Strategy (Department of Health 2019, 2021a, 2021b).

Although there have been many achievements in improving public health in Australia over the last century, inequalities in health across the population are still a challenge in the 21st century. Premature mortality and the prevalence of illness remain higher among lower socioeconomic groups, people living in remote areas and Indigenous Australians.

The COVID-19 pandemic has affected many aspects of life in Australia, including health behaviours, income and work – and how the health system operates (AIHW 2021i; see chapters 1, 2 and 3 of this report for more information). Other challenges will arise for future mortality trends related to modern lifestyle factors, such as obesity, physical inactivity and mental health. Furthermore, emerging global pressures, such as pandemics (UNEP and ILRI 2020), the rise of antibiotic and antimicrobial resistance (WHO 2020, 2021), and climate change (Haines and Ebi 2019; McMichael et al. 2012) may have an impact on the health of Australians into the future.

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