



Australian Government

Australian Institute of  
Health and Welfare

# Australia's health 2018





# Australia's health 2018



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Australian Government  
Australian Institute of  
Health and Welfare

AIHW



The Hon Greg Hunt MP  
Minister for Health  
Parliament House  
Canberra ACT 2600

Dear Minister,

On behalf of the Board of the Australian Institute of Health and Welfare, I am pleased to present to you *Australia's health 2018*, as required under Subsection 31(1) of the Australian Institute of Health and Welfare Act 1987.

This edition continues the AIHW tradition of delivering high quality evidence and value-added analysis on health-related issues. It provides comprehensive coverage of topics, including new narrative on topical issues, and provides insights into how national health information assets and future data could better meet the needs of policy makers, researchers and the public.

I commend this report to you as a significant contribution to national information on health-related issues, and to the development and evaluation of health policies and programs in Australia.

Yours sincerely

Mrs Louise Markus  
Chair  
AIHW Board

16 May 2018



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# Preface

*Australia's health 2018* marks the 16th biennial flagship report on health that the Australian Institute of Health and Welfare (AIHW) has released since it was established in 1987.

This latest national report card continues the trend of providing independent, trusted and timely information to the wide range of Australians who use it—the community, policymakers, service providers and researchers.

*Australia's health 2018* examines health using a person-centred approach—this takes the view that a person's health is part of a broader social context and encompasses the ideas that health:

- is an important part of how people feel and function
- contributes to, and is influenced by, social and economic wellbeing
- can exist in degrees of good, as well as poor, health and varies over time.

The report profiles our health status and use of health services, and takes an in-depth look at topical health issues, including the contribution of risk factors to disease burden; how the health of the population is linked to the natural environment; and the factors contributing to the increasing prevalence of overweight and obesity in our community. Other featured topics include mesothelioma—Australia has one of the highest diagnosis rates in the world for this cancer—and the increasing harm caused by the use of both pharmaceutical and illegal opioids.

The series of feature articles accompanies a collection of short statistical snapshots that outline the leading types of illness, risk factors, health behaviours, and the services available to help prevent and treat ill health.

The report also contains a breadth of information on the health—and health inequalities—experienced by some population groups, including Indigenous Australians; Australians from culturally and linguistically diverse backgrounds; Australian veterans; lesbian, gay, bisexual, transgender and intersex Australians; and Australians living in rural and remote areas.

The AIHW manages a number of national health information assets, and works with state and territory governments, the Australian Bureau of Statistics, other independent bodies and the non-government sector, to ensure that the data included in *Australia's health 2018* are comprehensive, accurate and timely.

Despite this, and ongoing efforts to develop and improve national health data, many gaps remain and information that are collected are not always used to their full potential. These and other data limitations are listed in 'What is missing from the picture?' sections throughout the report. Australia's health information and data environment is changing rapidly, with increasing demands made on the collection, reporting and use of health data. There is a strong need for a strategic approach to how we manage national health data assets in Australia—a strategy that provides a desirable vision for the future of Australia's national information resources. A structured, strategic approach to data and evidence is critical to support continuous improvement, innovation and progress in health.

For users who seek more detailed information, we are pleased to be able to provide a range of online visual presentations that supplement selected material throughout the report. This includes, for the first time, dedicated online reporting of Australia's performance against national indicators of health. All online content is available at <[www.aihw.gov.au/reports/australias-health/australias-health-2018](http://www.aihw.gov.au/reports/australias-health/australias-health-2018)>.

For those who seek an 'at a glance' summary of the key facts and concepts from the main report, we have again released an *Australia's health: in brief* companion report. I extend my thanks to everyone involved in producing this report and acknowledge the valuable contributions of the external experts and agencies involved in reviewing material.

This collaborative process, and the suite of *Australia's health 2018* products that it has helped to produce, highlight the AIHW's commitment to its 5 strategic goals—to be leaders in health and welfare data; drivers of data improvements; expert sources of value-added analysis; champions for open and accessible data and information; and trusted strategic partners.

The AIHW is committed to providing its data in the most accessible, user-friendly formats possible. As such, we are considering new approaches and structures for our biennial health and welfare reports and also welcome your feedback via [flagships@aihw.gov.au](mailto:flagships@aihw.gov.au). This will allow us to continue to deliver on our mission of providing stronger evidence, leading to better decisions and improved health and welfare for all Australians.

**Barry Sandison**

**Director**

# Acknowledgments

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Department of Health

Department of the Prime Minister and Cabinet

Department of Veterans' Affairs

National Disability Insurance Agency

NPS MedicineWise

Safe Work Australia

## Additional material online

*Australia's health 2018* is available online in PDF format. Individual articles and snapshots are also available in PDF format for easy downloading and printing.

*Australia's health 2018: in brief* is a companion report to *Australia's health 2018*. It presents some of the key findings and concepts from the main report and is available online in HTML and PDF formats.

*Australia's health 2018* and *Australia's health 2018: in brief* can be viewed and downloaded for free at <[www.aihw.gov.au/reports-statistics/health-welfare-overview/australias-health/](http://www.aihw.gov.au/reports-statistics/health-welfare-overview/australias-health/)>.

This edition of *Australia's health* has a comprehensive online presence, including online data visualisation tools that present dynamic or interactive content, supplementary tables that present the data underlying the charts in each chapter and supplementary documents that present additional technical information.

Online data visualisation tools are available for the following topics:

- Burden of disease scenario modelling
- BMI: where do you fit?
- Supply of the health workforce for the Indigenous population maps
- Indicators of Australia's health.

Online data visualisation tools can be viewed at <[www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/table-of-contents](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/table-of-contents)>.

Supplementary tables can be viewed and downloaded at <[www.aihw.gov.au/reports/australias-health/australias-health-2018/data](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/data)>.

Supplementary documents can be viewed and downloaded at <[www.aihw.gov.au/reports/australias-health/australias-health-2018/related-material](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/related-material)>.



*Australia's health 2018*



*Australia's health 2018: in brief*





# Chapter 1

An overview of Australia's health



# 1.0 Overview

Good health is important—it influences not only how we feel, but also how we go about our everyday lives. Health can mean different things to different people, but is widely accepted to be much more than the presence or absence of disease. It incorporates dimensions of physical, mental and social wellbeing and is influenced by factors such as our:

- individual and psychological make-up
- lifestyle
- environment and cultural influences
- socioeconomic conditions
- access to quality health care programs and services.

Australians generally have good health and an effective health system. How do we know this? We use a range of measures, such as life expectancy, mortality and morbidity, to monitor Australia's health over time and to compare it with that of other countries. For instance, we use the Australian Health Performance Framework to assess the health of our population and the performance of our health system. Since 1988, *Australia's health* has reported biennially on national indicators across the domains of health status, determinants of health, and the health system. Trend assessment for indicators across these three domains show mixed results:

- We have seen some favourable trends in the health status domain, including a decline in the incidence rate of heart attacks, bowel cancer and the prevalence of severe or profound core activity limitation. However, there have been unfavourable trends too: hospitalisations for injury and poisoning have been increasing.
- The proportion of adults who are daily smokers, who are at risk from long-term harm from alcohol and who have an educational attainment of a non-school qualification or above have all been trending favourably over the last 10 years. However, not all news in the determinants of health domain is positive: the proportion of people who are obese and overweight has been increasing over the past 20 years.
- Assessment of the health system domain shows favourable progress for a number of indicators, including immunisation rates for 1- and 5-year-olds and potentially avoidable deaths. There has been no change over the last 10 years in some measures, such as wait times for emergency departments, however, the wait time for elective surgery has increased (an unfavourable trend).

Australia is a diverse nation. Its more than 25 million people have different backgrounds and lived experiences. In 2016, more than one-quarter (26%) of its people were born overseas, an estimated 3.3% (787,000) identified as Aboriginal and Torres Strait Islander and about 71% (17.2 million) lived in *Major cities*.

Nationally, our life expectancy at birth has increased over time. Between 1890 and 2016, it rose for males from 47.2 to 80.4 years, and for females from 50.8 to 84.6 years. Australia now has the fifth highest life expectancy for males and the eighth highest for females compared with other member countries of the Organisation for Economic Co-operation and Development (OECD).

We are living longer lives, and those extra years are being lived in good health. A person can, however, have different states of health at different stages of their life. A measure called the health-adjusted life expectancy estimates, on average, how many years are lived in full health. It forecasts that males born in 2011 can expect to have 1.7 more years in full health than males born in 2003, while females can expect 1.2 more years.

While Australia performs well internationally on some measures of health, there is room for improvement on others. At 12%, Australia has one of the lowest rates of smoking among adults in the OECD, and a better than average rate of colon cancer survival, ranking third best. However, it has higher rates than the OECD average of alcohol consumption and obesity among people aged 15 and over.

The AIHW manages many important national health and welfare data collections. Evidence based on these data—together with health information collected by other government and non-government agencies—are used to inform research findings and policy decisions. Despite the breadth of health information available, there are gaps in our knowledge and opportunities to make better use of existing data, including through data linkage. Australia's health information and data environment is also changing rapidly. A coordinated, strategic approach to identify gaps, overlaps and priorities in health information would benefit policy, service delivery and research needs.

# 1.1 What is health?

Health is a state of wellbeing. It reflects the complex interactions of a person's genetics, lifestyle and environment. Generally, a person's health depends on two things: determinants (factors that influence health) and interventions (actions taken to improve health, and the resources required for these interventions).

Some definitions view the health of an individual as the presence or absence of disease or medically measured risk factors. The World Health Organization's definition of health is broader and more multidimensional—namely, 'a state of complete physical, mental and social well being and not merely the absence of disease or infirmity' (WHO 1946).

Australians are generally seen to enjoy good health and to have an effective health system. How do we know this? We use the Australian Health Performance Framework to assess the health of our population and health system. It outlines health indicators that describe specific elements of our health or aspects of our health system's performance; it also compares data for different population groups, different geographic regions, and internationally. The Framework includes the domains of health status, determinants of health, and the health system (see Chapter 1.4 'Indicators of Australia's health').

## Measures of health status

Figure 1.1.1 outlines some of the more common measures of the health status of an individual and a population.

**Figure 1.1.1: Common measures of health**

Life expectancy	The number of years of life, on average, remaining to an individual at a particular age if death rates do not change. The most commonly used measure is life expectancy at birth.
Mortality	The number of deaths in a population in a given period.
Morbidity	Ill health in an individual and levels of ill health within a population (often expressed through incidence, prevalence and comorbidity measures—see Glossary).
Disability-adjusted life year (DALY)	One year of healthy life lost due to illness and/or death. DALYs are calculated as the sum of the years of life lost due to premature death and the years lived with disability for people living with the health condition or its consequences.
Health-adjusted life expectancy	The average length of time an individual at a specific age can expect to live in full health; that is, time lived without the health consequences of disease or injury.
Self-assessed health status	An individual's own opinion about how they feel about their health, their state of mind and their life in general.

These measures are useful to compare health outcomes across different populations as well as to look specifically at certain health conditions (see Chapter 3 for more information on health conditions; chapters 5 and 6 for more information on the health of population groups).

We glean many useful insights into the health of individuals and populations from health data. Information so gained can then be used to improve health and health services and to reduce health inequity across population groups.

## Impact of determinants

Health determinants are multifaceted, interrelated factors that influence health.

Figure 1.1.2 divides them into four groups. The main direction of influence (as shown by the horizontal arrows) is from left to right; that is, from contextual factors (such as culture and affluence) through to more immediate influences (such as blood pressure).

The importance of the broader social determinants of health—not only social, but also economic, political, cultural and environmental determinants—is becoming better understood. Essentially, these are the conditions into which people are born, grow, live, work and age (WHO 2015). At all stages along the path, the various factors shown in the four groups in Figure 1.1.2 interact with an individual's physical and psychological make-up. As well, the factors within each of these groups often interact with each other and are closely interrelated (see Chapter 4 for more information on determinants of health).

## Role of the health system

A major aim of any health system is to prevent disease and other ill health and injury and to maintain health—not just to treat illness—so that people remain as healthy as possible for as long as possible. This approach includes a focus on the quality and timeliness of health care received, including preventive health care such as screening and immunisation. However, as health is not merely the absence of disease, our health system also plays a vital role in positively influencing our health status by building social and physical environments that support health and promote healthy behaviours (see Chapter 7 for more information on prevention, treatment and health services).

## Where do I go for more information?

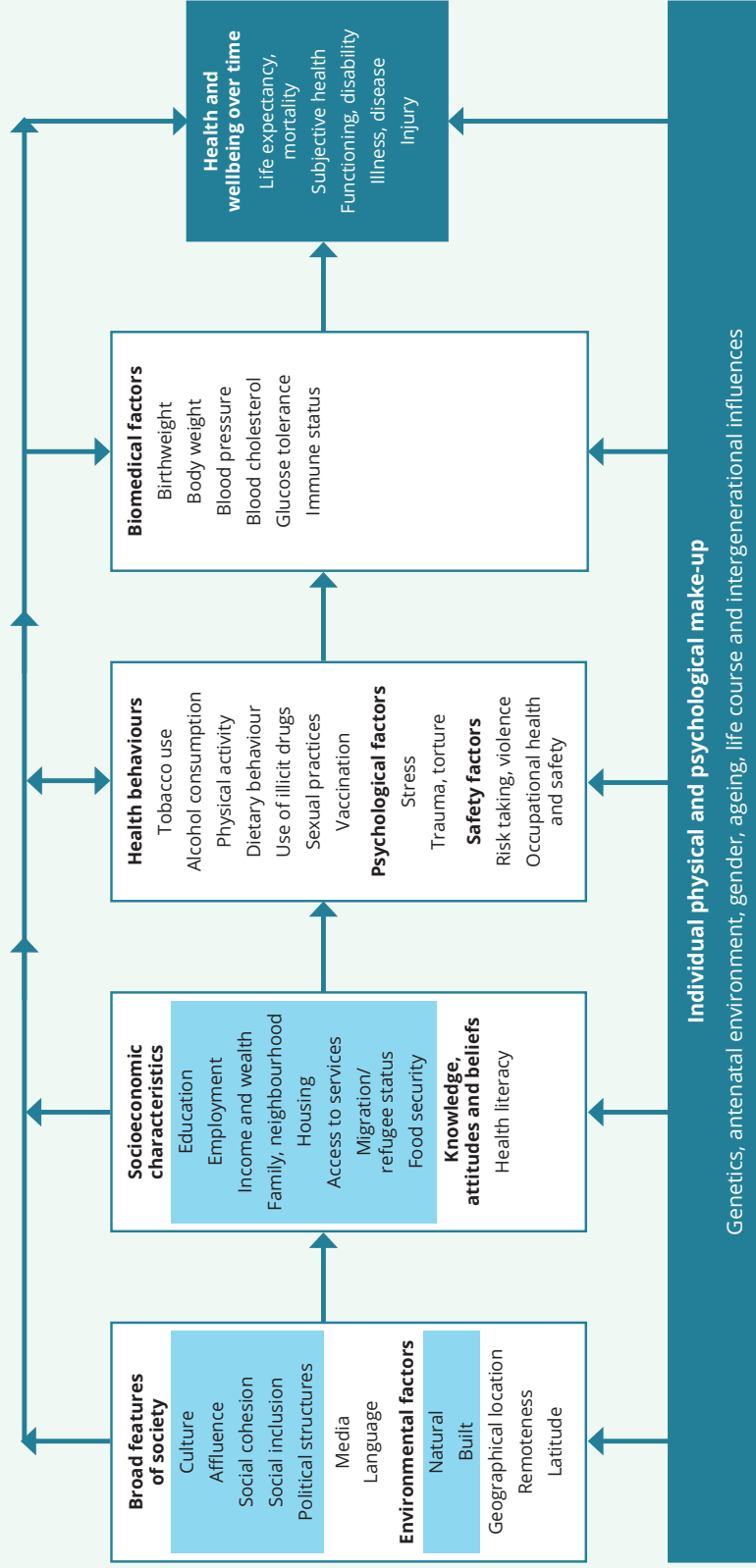
More information on health definitions, social determinants of health, global health actions and data can be obtained from the World Health Organization website <[www.who.int](http://www.who.int)>.

## References

WHO (World Health Organization) 1946. Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19–22 June 1946. New York: WHO.

WHO 2015. Social determinants of health. Geneva: WHO. Viewed 8 January 2018, <[http://www.who.int/social\\_determinants/en/](http://www.who.int/social_determinants/en/)>.

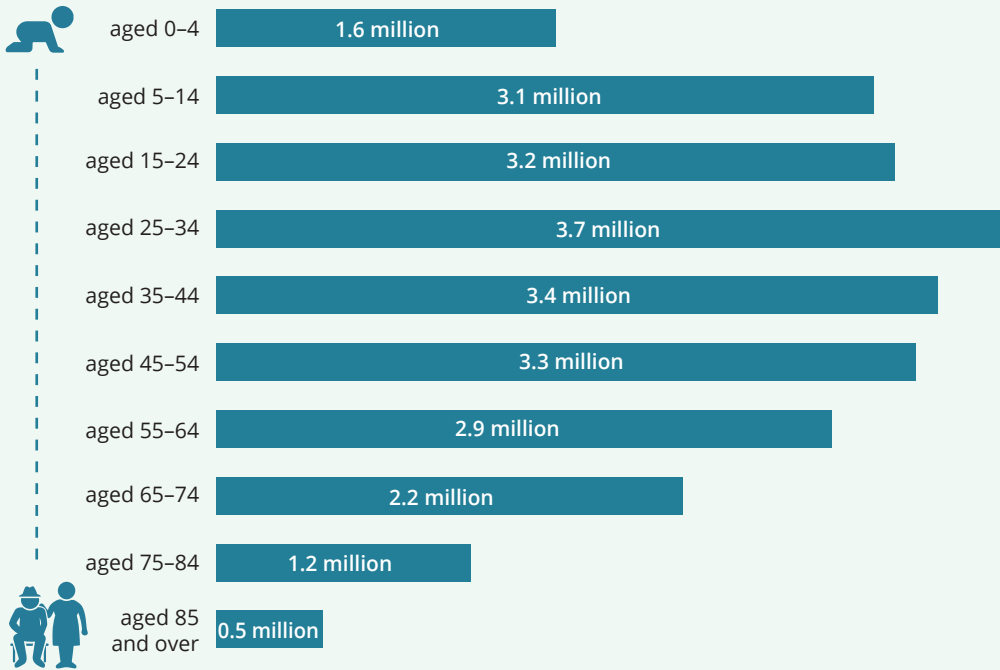
Figure 1.1.2: Framework for determinants of health



Note: Blue shading highlights selected social determinants of health.

# 1.2 Profile of Australians

In 2018, our estimated population is **25.2 million**:



Source: ABS 2013.

In 2016, an estimated **3.3%** of Australians identified as Aboriginal and/or Torres Strait Islander—  
**787,000 people** (ABS 2017a).



In 2016, **26%** of people were born overseas—  
**6.1 million people** (ABS 2017e).



In 2015, an estimated **18%** of people had disability—  
**4.3 million people** (ABS 2016).



An estimated **11%** of Australians may be of diverse sexual orientation, sex or gender identity (AHRC 2014).



In 2016:



**71%** lived in *Major cities*—  
**17.2 million people**

**Growth  
from 2006**

**21%**



**18%** lived in *Inner regional areas*—  
**4.4 million people**

**15%**



**8.6%** lived in *Outer regional areas*—  
**2.1 million people**

**8.4%**



**1.3%** lived in *Remote areas*—  
**308,000 people**

**1.4%**



**0.8%** lived in *Very remote areas*—  
**194,000 people** (ABS 2017f)

**5.7%**

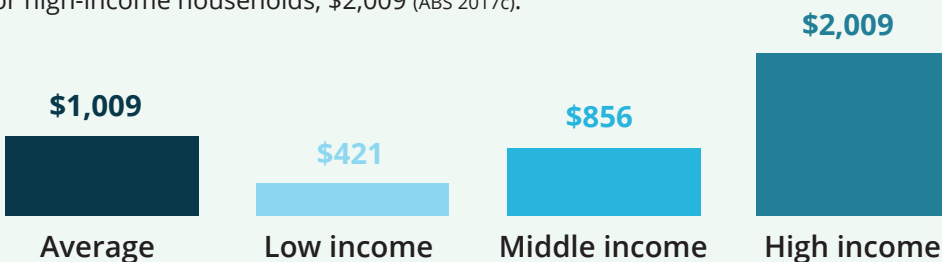


In December 2017, the employment to population ratio for people aged 15 and over was **62%** and the unemployment rate was **5.4%** (ABS 2017d).



In 2017, of people aged 20–64, **66%** held a non-school qualification and **31%** had attained a Bachelor degree qualification or higher (ABS 2017b).

In 2015–16, in real terms, the average disposable household income (after adjusting for the number of people in the household) was \$1,009. The weekly income for low-income households was \$421; for middle-income households it was \$856 and for high-income households, \$2,009 (ABS 2017c).





## References

ABS (Australian Bureau of Statistics) 2013. Population projections, Australia, 2012 (base) to 2101. ABS cat. no. 3222.0. Canberra: ABS.

ABS 2016. Disability, ageing and carers, Australia: summary of findings, 2015. ABS cat. no. 4430.0. Canberra: ABS.

ABS 2017a. Australian demographic statistics, Mar. 2017. ABS cat. no. 3101.0. Canberra: ABS.

ABS 2017b. Education and work, Australia, May 2017. ABS cat. no. 6227.0. Canberra: ABS.

ABS 2017c. Household income and wealth, Australia, 2015–16. ABS cat. no. 6523.0. Canberra: ABS.

ABS 2017d. Labour force, Australia, Dec. 2017. ABS cat. no. 6202.0. Canberra: ABS.

ABS 2017e. Migration, Australia, 2015–16. ABS cat. no. 3412.0. Canberra: ABS.

ABS 2017f. Regional population growth, Australia, 2016. ABS cat. no. 3218.0. Canberra: ABS.

AHRC (Australian Human Rights Commission) 2014. Face the facts: lesbian, gay, bisexual, trans and intersex people 2014. Sydney: AHRC.

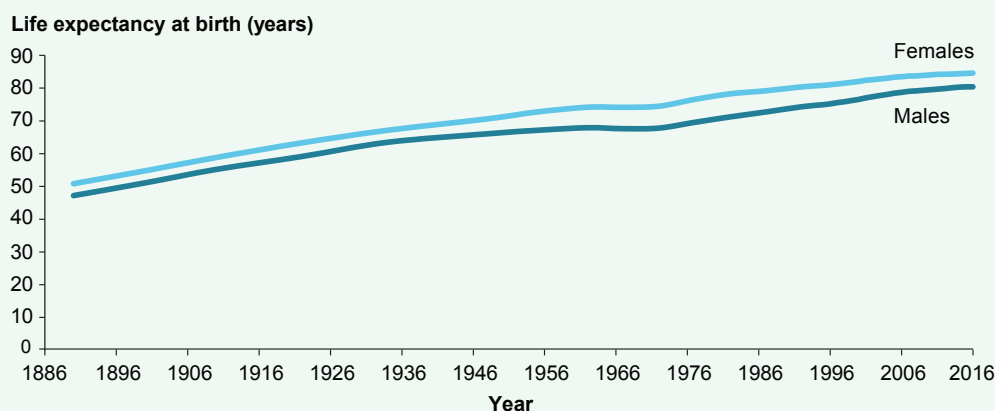
# 1.3 How healthy are Australians?

Australians generally have good health. We know this based on the range of measures we use (see Chapter 1.1 'What is health?') to compare our health over time or with that of other countries (see Chapter 1.5 'International comparisons').

## Australians are living longer...

Life expectancy at birth in Australia has risen steadily over time. In 2016, life expectancy at birth was 80.4 years for males and 84.6 years for females (Figure 1.3.1).

Figure 1.3.1: Life expectancy at birth, by sex, 1886–2016



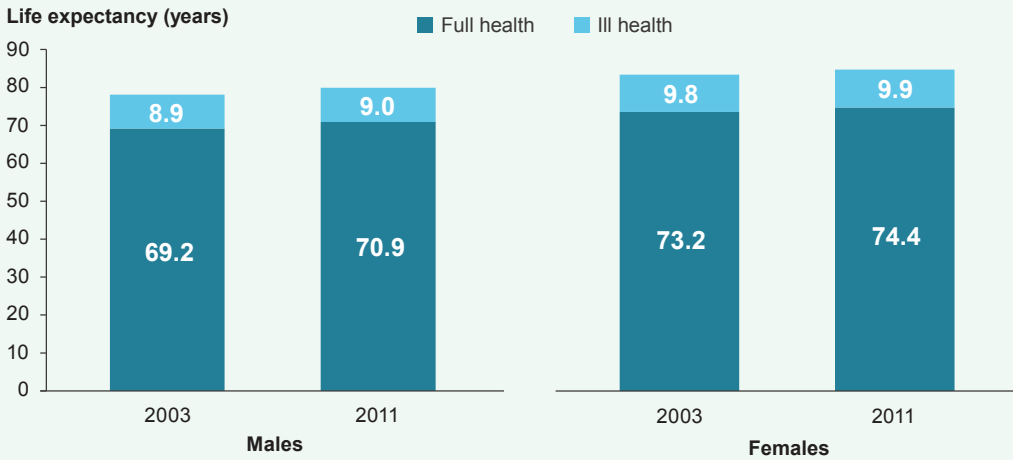
Sources: ABS 2014, 2017; Table S1.3.1.

Life expectancy measures how long, on average, a person is expected to live, based on current age and sex-specific death rates. Life expectancy changes over a person's lifetime; as they survive through birth, childhood and adolescence, their chance of reaching older age increases. Men aged 65 in 2016 could expect to live another 19.6 years and women aged 65 could expect to live another 22.3 years (ABS 2017).

## ...and with more years in good health

Are longer lives also healthier lives? During their lifetime, a person can have different states of health. The health-adjusted life expectancy (HALE) estimates, on average, how many years a person will live in full health. As life expectancy has increased, so, too, has the HALE—meaning people are living longer, and with more years of full health. Males born in 2011 could expect 1.7 more years in full health than males born 8 years earlier; females could expect 1.2 more years. These gains in healthy years are comparable to the gains in life expectancy. We are still, however (in 2011), living the same number of years in ill health as we were in 2003: 9.0 years for males and 9.9 for females (Figure 1.3.2).

Figure 1.3.2: Life expectancy at birth in full health (HALE) and ill health, by sex, 2003 and 2011



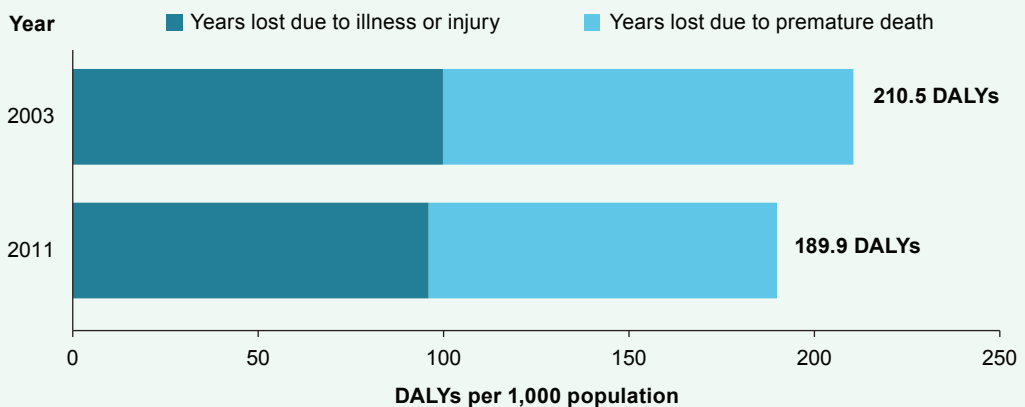
Source: AIHW 2017; Table S1.3.2.

## Australia is making population health gains

We can assess the current health status of the population by looking at the impact of living with illness and dying early. We call this the ‘burden of disease’ and express it as disability adjusted life years (DALYs). (DALYs measure the number of years of healthy life lost due either to premature death—dying before the ideal life span—or to living with ill health due to illness or injury.)

There were good gains in the health of the Australian population between 2003 and 2011. Based on findings from the 2011 Australian Burden of Disease Study, the age-standardised DALY rate fell by 10%, mostly due to reductions in premature death (Figure 1.3.3).

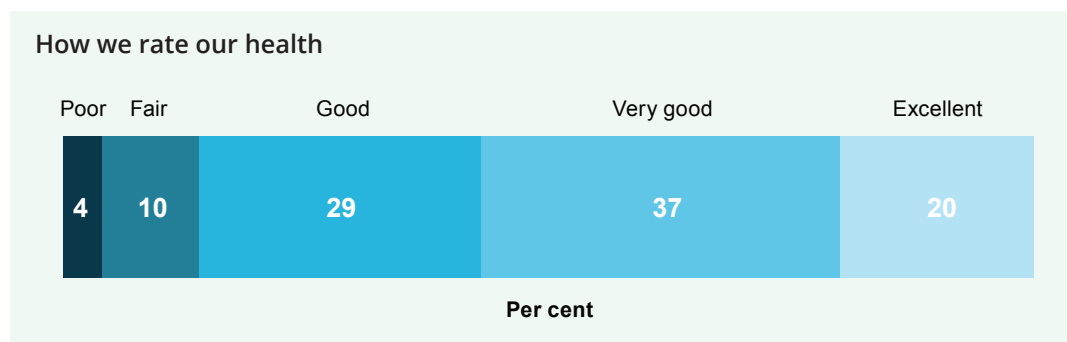
Figure 1.3.3: Composition of total burden of disease (DALY rate), 2003 and 2011



Source: AIHW 2016; Table S1.3.3.

# Australians rate their health well

In 2014–15, more than half (57%) of Australians aged 15 and over self-rated their health as 'excellent' or 'very good'—similar to the proportion recorded a decade earlier, in 2004–05 (ABS 2015).



These self-assessed health measures provide insight into the health of Australians at a population level. Health indicators are an important way to assess not only the health of our population but also the success of our health services and the health system. The health indicators currently agreed for national reporting are presented in Chapter 1.4 'Indicators of Australia's health'. This report also presents disease-specific measures of mortality and morbidity in Chapter 3. Some population groups have higher rates of illness, health risk factors and death than others. Chapters 5 and 6 present information on health inequalities and measure the health of selected population groups.

## Where do I go for more information?

Self-assessed health measures are collected in the Australian Bureau of Statistics National Health Survey. The most recent results for the [2014–15 National Health Survey](#) and measures of life expectancy are available at [www.abs.gov.au](http://www.abs.gov.au).

The reports *Australian Burden of Disease Study: impact and causes of illness and death in Australia 2011* and *Health-adjusted life expectancy in Australia: expected years lived in full health 2011* are available for free download from [www.aihw.gov.au](http://www.aihw.gov.au).

## References

ABS (Australian Bureau of Statistics) 2014. Australian historical population statistics, 2014. ABS cat. no. 3105.0.65.001. Canberra: ABS.

ABS 2015. National Health Survey: first results, 2014–15. ABS cat. no. 4364.0.55.001. Canberra: ABS.

ABS 2017. Life tables: states, territories and Australia, 2014–2016. ABS cat. no. 3302.0.55.001. Canberra: ABS.

AIHW (Australian Institute of Health and Welfare) 2016. Australian Burden of Disease Study: impact and causes of illness and death in Australia 2011. Australian Burden of Disease Study series no. 3. BOD 4. Canberra: AIHW.

AIHW 2017. Health-adjusted life expectancy in Australia: expected years lived in full health 2011. Australian Burden of Disease Study series no.16. BOD 17. Canberra: AIHW.

# 1.4 Indicators of Australia's health

Health indicators are an important way to assess the health of our population and the success of our health services and health system. These summary measures describe particular aspects of our health and health system performance and have a range of purposes. They can:

- offer insights into the health of Australians and the quality of the health system at a point in time (and allow different population groups, different regions and different countries to be compared)
- provide information on the effectiveness of changes to policies or new practices and programs (when measured consistently over time)
- improve accountability and transparency of service provision, and support consumer choices relating to health care
- encourage ongoing improvement in service delivery by highlighting areas of innovation and where better performance is needed.

The indicators selected generally reflect what is important to governments, service providers, funders of services (including taxpayers), and to patients and the broader Australian community.

Nationally agreed health indicators are usually compiled and reported as 'sets' of measures, organised into frameworks. Health indicator frameworks provide the conceptual basis for the indicator sets; they describe the broad aspects of health, its determinants and the health care system to be measured (for example, equity, quality and efficiency). They also depict the relationships between the indicators within the framework, and provide transparency in describing which aspects of the system are being assessed (or not able to be assessed).

In Australia, a number of health indicator frameworks are used to assess aspects of our health and health system. Some are related, and hence specific indicators may appear in more than one framework—but they have different purposes. This article provides information on the major national indicator frameworks in Australia, including the new Australian Health Performance Framework (AHPF). It also outlines the latest data available against the indicators agreed for reporting under the National Health Performance Framework (NHPF), now subsumed by the AHPF.

# New Australian Health Performance Framework

The AHPF was recently agreed by Australian and state/territory health ministers. It provides a single, enduring framework that can be used in different ways to assess the Australian health care system and its inputs, processes and outcomes (NHIPPC 2017). It replaces the NHPF and the Performance and Accountability Framework, which had separate but interrelated purposes:

- The NHPF was agreed by the Australian Health Ministers' Advisory Council in 2001 (NHPC 2002) to provide a conceptual framework to understand and evaluate the health of Australians and the health system, and to serve as a general support for performance assessment, planning and benchmarking in the health sector. In recent years, the AIHW reported biennially on the national indicators agreed under this framework in the *Australia's health* report series (see, for example, AIHW 2016a).
- The Performance and Accountability Framework was agreed under the National Health Reform Agreement (COAG 2011) to provide Australians with comparable, locally relevant information about the performance of hospitals and health services to support informed decision making by consumers and health care providers and managers. The Performance and Accountability Framework indicators were identified for reporting in two streams: for Primary Health Networks, and for hospitals/Local Hospital Networks; data are published by the AIHW on the [MyHealthyCommunities](#) and [MyHospitals](#) websites, respectively.

While these indicator frameworks and indicators were designed for different uses, the purposes were related; hence, there was some overlap in the indicators reported. Health ministers decided that it would be preferable to merge the frameworks into a single framework that could be used in a flexible way. This would enable reporting for use by different audiences, for different populations and at different levels of the health system (for example, reporting at the international, national, state/territory, and local area level).

The AHPF comprises a Health System Conceptual Framework, and a Health System Performance Logic Model.

## Health System Conceptual Framework

The conceptual framework depicts the indicator domains relevant to assessing the health system as a whole, namely: health status, determinants of health, and the health system (Figure 1.4.1). Key components are identified within these domains (for example, within the health status domain, it is relevant to consider including indicators that relate to health conditions, human functioning, wellbeing and deaths).

The conceptual framework also identifies a range of information needs that can be considered as ‘health system context’; that is, factors that are often beyond the direct control of health system decision makers (such as the demographic composition of the population). This is not a performance domain as such, but recognises information that is relevant in the planning, delivery and evaluation of health services.

‘Equity’ is recognised as a principle that applies across all domains, and one that should be reflected in appropriate reporting. The interrelationships between all domains is recognised explicitly in this framework presentation.

## Health System Performance Logic Model

The performance logic model presents similar domains to the conceptual model, but is organised in a program logic model. This indicates how the framework could be used to evaluate the outcome of specific health programs, initiatives and interventions—that is, in a performance measurement context (Figure 1.4.2).

For example, a number of the domains that were considered ‘health system context’ in the conceptual framework are considered to be ‘health system inputs’ in this model. Similarly, the ‘health status’ domain in this model is re-framed in terms of ‘health system outcomes’ where the focus is on measuring change in health status associated with a specific intervention or policy. The Health System Performance Logic Model is based on the service process model used for the *Report on Government Services (RoGS)* (SCRGSP 2018), which is further described elsewhere in this article.

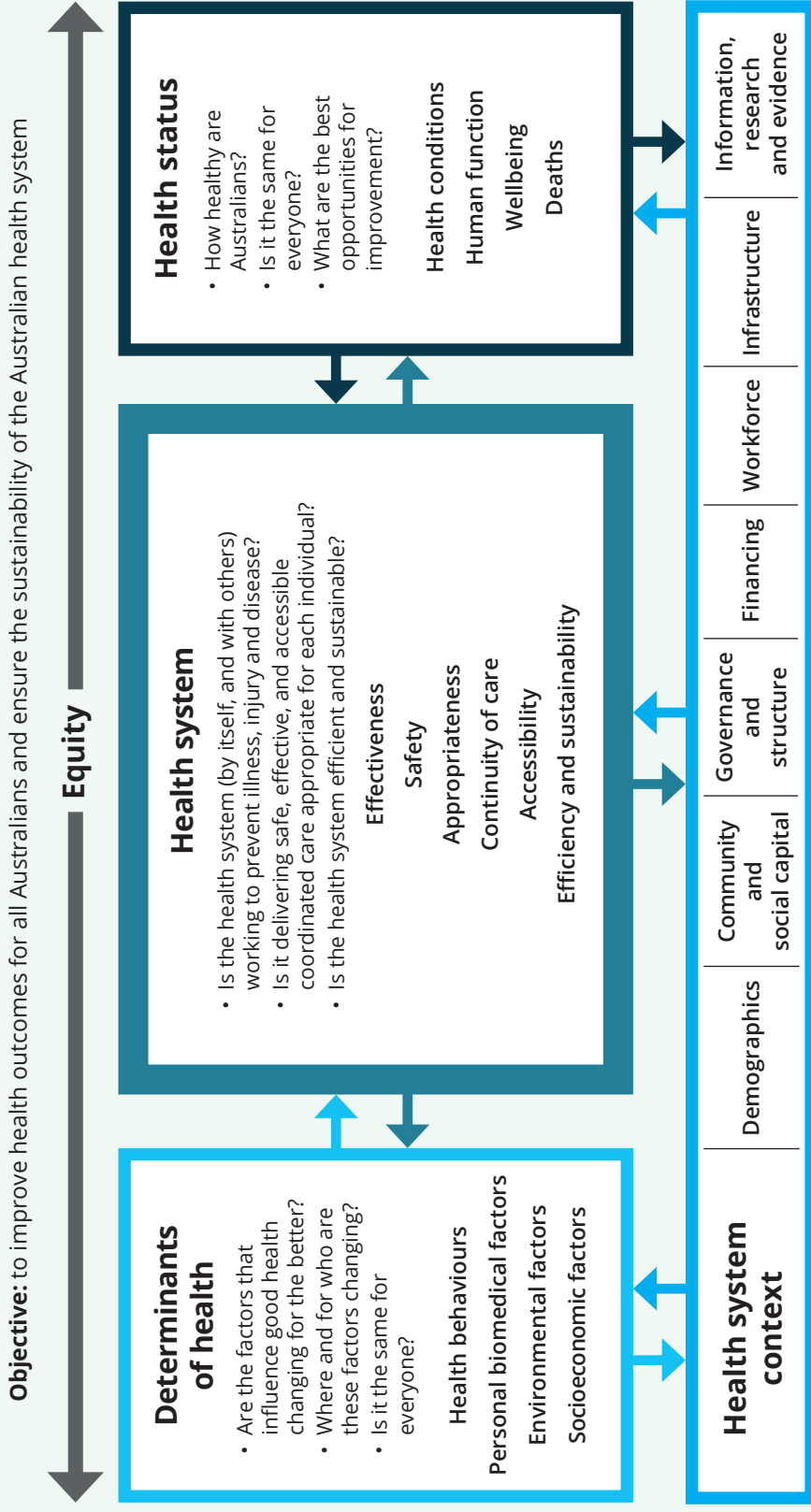
## Implementing the new framework

Indicator sets and reporting arrangements for the AHPF will be developed, aiming to ensure that indicator content and reporting formats continue to reflect national strategic priorities for health and health care delivery, and are delivered in ways that are most relevant for key audiences.

In the first instance, indicators previously agreed for reporting under the NHPF and the Performance and Accountability Framework have been transferred to the AHPF. Data for those indicators previously agreed to be relevant for national reporting (that is, the NHPF indicators) are summarised later in this article, but presented against the AHPF conceptual framework. At a later date, it is expected that these existing indicators will be reviewed in working towards a full set of indicators under the framework.

This work is also expected to identify relevant tiers for reporting that would allow for data presentation to be disaggregated in different ways—for example, at the state/territory and national levels and at different geographic levels, as well as for individual service providers, targeted population groups, people experiencing different health conditions, and for public and private health care providers and funders.

Figure 1.4.1: AHPF Health System Conceptual Framework

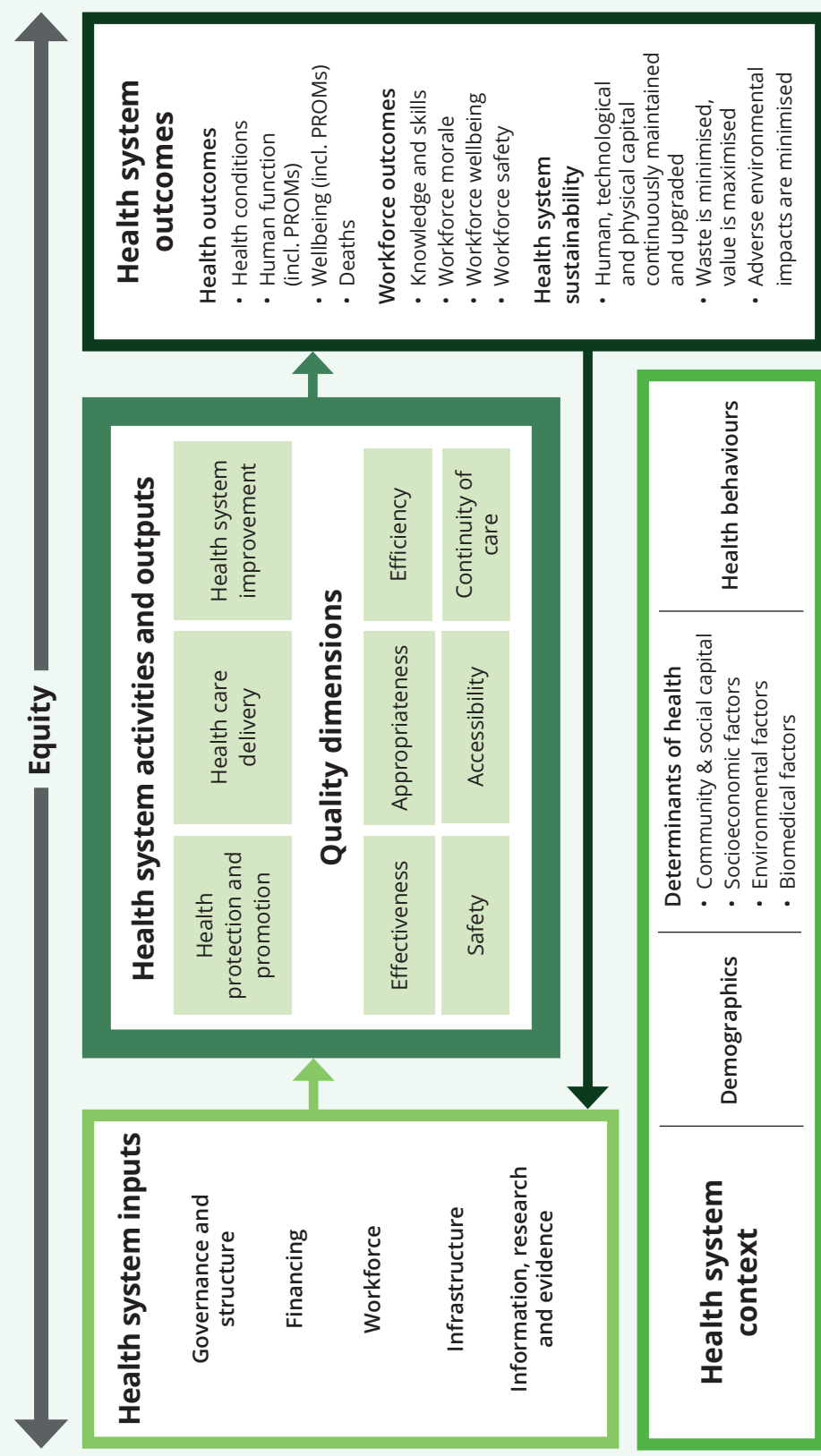


Note: See supplementary document S1.4 'Australian Health Performance Framework: detailed Health System Conceptual Framework' for a more detailed version of this figure <[www.aihw.gov.au/reports/australias-health/australias-health-2018/related-material](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/related-material)>.

Source: Adapted from National Health Information and Performance Principal Committee 2017.



Figure 1.4.2: AHPF Health System Performance Logic Model



PROM = Patient-reported outcome measure.

Source: Adapted from National Health Information and Performance Principal Committee 2017.

# Other national health performance frameworks

As well as the AHPF, there are other national performance indicator frameworks and monitoring activities used in Australia and applied in the health context. Key frameworks are summarised in this section.

## National Healthcare Agreement

The National Healthcare Agreement is an agreement between the Australian Government and state and territory governments that outlines the role and aims of Australia's health system, the roles and responsibilities of the parties, the policy and reform directions proposed to achieve desired outcomes, and accountability requirements (COAG 2012a). These requirements include reporting against specific performance indicators and performance benchmarks outlined within the specified outcome areas (better health, better health services, social inclusion and Indigenous health, and sustainability of the health system). Where possible, indicator data are disaggregated for specific population groups to ensure that the aims of focusing on social inclusion and tackling Indigenous disadvantage are being met.

The National Healthcare Agreement indicator data are reported annually in the RoGS series (for example, SCRGSP 2018), along with other indicator data.

As well as the National Healthcare Agreement, a range of other national agreements (for example, the National Indigenous Reform Agreement—COAG 2012b) include performance indicators for health and health service delivery. Some of these indicators are also included in the National Healthcare Agreement.

## Report on Government Services

Publication of an annual RoGS was initiated by the heads of government (now the Council of Australian Governments) to provide information on the equity, efficiency and effectiveness of a range of government human and social services in Australia, and to promote ongoing performance improvement. The first RoGS was published in 1995.

In recent years, the RoGS has been based on performance indicators set against a framework (consistent across all service areas) that reflects the review's focus on outcomes, consistent with the demand of governments for outcomes-oriented performance information.

Performance indicators included in the RoGS are supplemented by information on outputs, grouped under equity, effectiveness and efficiency headings. The RoGS for 2018 included chapters on public hospitals, ambulance services, primary and community health, and mental health management (SCRGSP 2018).

## Sector and population specific frameworks

As well as national performance frameworks, there are several other (related) performance frameworks. These support more in-depth monitoring of the health status of, and services delivered to, specific populations—for example, the Aboriginal and Torres Strait Islander Health Performance Framework (AHMAC 2017)—or focus on specific types of health services, such as the National Core Maternity Indicators (AIHW 2016b).

Performance monitoring and reporting at other ‘levels’ of the health system are also undertaken; for example, by states and territories, by some service provider organisations, and by participating in international reporting activities (see Chapter 1.5 ‘International comparisons’ for some indicator data available at the international level).

Over time, some of these Australian indicator frameworks may be ‘re-framed’ by the owners of the indicator sets and presented against the AHPF. This would help to ensure that similar indicators in different indicator sets are reported consistently wherever possible.

## Other related monitoring and reporting activities

Supplementing the national indicator framework and performance reporting arrangements are the activities of health service providers in measuring and monitoring performance within their organisations, and in improving clinical outcomes and the appropriateness of services. These activities are related to (but not considered the same as) ‘performance reporting’, and organisations may or may not choose to make this information publicly available. For example, the national Key Performance Indicators for Aboriginal and Torres Strait Islander primary health care support continuous quality improvement within services (AIHW 2017).

In recent years, the Australian Commission on Safety and Quality in Health Care has supported these activities. As part of its work to lead coordinated improvement in safety and quality in health care across Australia, the Commission undertakes and helps to enable the development of safety- and quality-related indicators for use in such local monitoring (see Chapter 7.9 ‘Safety and quality of hospital care’ for more information about safety and quality monitoring in Australian hospitals).

# AHPF indicators for national reporting

The rest of this article presents the latest data for indicators currently agreed for national reporting in the AHPF. These indicators were previously agreed as NHPF indicators; the other indicators that have been transitioned to the AHPF were previously agreed for reporting either at local area levels (that is, at the Primary Health Network level), or the hospital (or Local Hospital Network) level. Data for those indicators will continue to be made available on the [MyHealthyCommunities](#) and [MyHospitals](#) websites.

Key findings are presented in the following section—reported in three sections that align with the AHPF conceptual framework domains: health status, determinants of health, and health system. Note that as there are currently no agreed information requirements for the 'health system context' domain (as there was no equivalent domain included in the previous NHPF), information on this domain is not presented in this chapter, although relevant context information is available elsewhere in this report. Where possible, indicators are disaggregated for relevant population groups to ensure that they also satisfy the 'equity' reporting requirements under the framework.

Also included for each section is a table stating whether new data have become available since *Australia's health 2016* (AIHW 2016a) and whether the available data show a favourable or unfavourable trend (where this could be assessed).



For more information on each indicator and to view detailed data see the online data visualisation tool at [www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/indicators-of-australias-health](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/indicators-of-australias-health).

## Assessment of trends

Trends have generally been assessed using the most recent 10 years of data where comparable data were available for at least 3 time periods. In a small number of cases (where data sources have become available irregularly or on a triennial basis), a slightly longer time period was considered (up to 12 years). These time periods were used for the trend assessment even where time series information is presented in this article for longer periods; the exceptions are cancer survival rates and rates of overweight and obesity, for which the trend assessment is based on the longer time series information discussed in the indicator text.

A favourable trend is noted when the indicator has moved in the desired direction—for example, the proportion of people eating the recommended number of serves of fruit and vegetables should increase and instances of unsafe sharing of needles should decrease. A trend is considered unfavourable if it is opposite to the desired direction. For indicators where the measure does not appear to have changed meaningfully over the time period, the trend is described as 'no change'. For indicators where there are insufficient data to support trend analysis, the trend is described as 'no data/insufficient data'.

## Limitations of the AHPF performance indicators

The performance indicators for national reporting were last reviewed and endorsed (as indicators under the NHPF—now replaced by the AHPF) by health ministers in 2009. Over time, some limitations have become evident for a number of them. Data quality may have diminished, for example, where changes in service delivery has meant that data would need to be captured from more disparate sources, or changes in policies and priority areas for monitoring have meant that the usefulness of some indicators is now questionable.

In this report, a small number of indicators previously reported at the national level are not reported here:

- *Survival following an acute coronary heart disease event* (last reported in 2012). The AIHW has judged that, due to changes in the method used to identify acute coronary events, reporting on this indicator is not appropriate.
- *Proportion of people with diabetes who complete a GP annual cycle of care* (last reported in 2012). The AIHW has assessed that the available data are likely to result in an underestimate, due to changes in treatment patterns, and a recognition that people with diabetes may use other avenues for care.
- *Selected potentially avoidable GP-type presentations to emergency departments* (last reported in 2014). Previous work has shown limitations in the method used (AIHW 2015) and so the data are not presented here; indicator data are presented in the RoGS (SCRGSP 2018).
- *Cost per casemix-adjusted separation for acute and non-acute episodes* (last reported in 2014). A range of stakeholders regard the previous calculation method as being no longer appropriate, and a revised method has not yet been agreed.

For indicators where no new data are available or where new data could not be readily obtained, previously reported data are used, though new disaggregations are presented where appropriate.

# Key results

## Health status

The health status domain is assessed by considering measures related to the incidence or prevalence of health conditions, and measures related to human functioning, wellbeing and mortality rates and life expectancy.



























The indicators reported for health status are outlined in Table 1.4.1.



For more information on each indicator and to view detailed data see the online data visualisation tool at [www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/indicators-of-australias-health](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/indicators-of-australias-health).

- In 2015, the heart attack rate for men was more than twice that for women, though rates have declined for both men and women since 2007. Overall, there has been a decline of 37% in the rate of heart attack since 2007.
- In the latest 10 years for which data are available, there has been an increase in the incidence of breast cancer in females and a decrease in the incidence of bowel cancer. Rates of melanoma of the skin and lung and cervical cancer have remained stable over this period.
- Over the last 10 years for which data are available, notification rates for hepatitis B and C have fallen, but rates of syphilis, chlamydia and gonorrhoea have risen. The notification rate of human immunodeficiency virus (HIV) has remained steady and was 4.2 notifications per 100,000 people in 2016.
- In 2013, there were 5,100 new cases of end-stage kidney disease—an age-standardised rate of 19 per 100,000 people. The incidence rate increases substantially with age.
- In 2015–16, there were an estimated 509,900 hospitalised cases due to injury and poisoning. Rates of hospitalised cases for injury and poisoning increase substantially with age for people aged 75 and over.
- In 2015, 5.0% of liveborn singleton babies were of low birthweight. The proportion of low birthweight singleton babies born to Aboriginal and Torres Strait Islander mothers was 2.2 times the proportion of babies born to non-Indigenous mothers.
- In 2015, 1.4 million people had a severe or profound core activity limitation—that is, a limitation in communication, mobility and/or self-care activities. Overall, the proportion of people with a severe/profound core activity limitation had decreased since 2003.
- The death rate for infants aged under 1 and children aged 1–4 has decreased since 2001—a trend that has been maintained in the most recent 10 years for which data are available. Since 2001, the death rate for Indigenous infants also fell, however, the rate is still almost twice that for all infants.
- Life expectancy for a boy born in Australia between 2014 and 2016 was 80.4 years, and for a girl, 84.6 years. However, the estimated life expectancy for an Indigenous boy born between 2010 and 2012 was 10.6 years lower than for a non-Indigenous boy, and for girls the difference was 9.5 years.

Table 1.4.1: Indicators of AHPF domain—health status

Trend legend		
		
Favourable	Unfavourable	No change
		
		No data/insufficient data
AHPF dimension/Indicator	New data available	10-year trend assessment
<b>Health conditions</b>		
Incidence of heart attacks	Yes	
Incidence of selected cancers		
Breast cancer (females) <sup>(a)</sup>	Yes	—
Bowel cancer	Yes	
Melanoma of the skin	Yes	
Lung cancer	Yes	
Cervical cancer	Yes	
Incidence of sexually transmissible infections and blood-borne viruses		
Syphilis	Yes	
Human immunodeficiency virus (HIV)	Yes	
Hepatitis B	Yes	
Hepatitis C	Yes	
Chlamydia	Yes	
Gonorrhoea	Yes	
Incidence of end-stage kidney disease	Yes	
Hospitalisation for injury and poisoning	Yes	
Proportion of babies born with low birthweight	Yes	
<b>Human function</b>		
Severe or profound core activity limitation	Yes	
<b>Wellbeing</b>		
Psychological distress	No	
Self-assessed health status	No	
<b>Deaths</b>		
Infant/young children mortality rate		
All infants (<1 year)	Yes	
Indigenous infants (<1 year)	Yes	
All children aged 1–4 years	Yes	
Life expectancy		
All males	Yes	
All females	Yes	
Indigenous males	No	••
Indigenous females	No	••

(a) Breast cancer incidence has increased but is not assessed as unfavourable because increases in observed incidence may be due to improved detection.

## Determinants of health

The determinants of health domain is assessed by considering measures related to health behaviours, and personal biomedical, environmental and socioeconomic factors.

The indicators reported for health status are outlined in Table 1.4.2.















For more information on each indicator and to view detailed data see the online data visualisation tool at <[www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/indicators-of-australias-health](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/indicators-of-australias-health)>.

- In 2014–15, 14.5% of people aged 18 years and over smoked daily (16.9% of men and 12.1% of women). Age-adjusted daily smoking rates have fallen since 1989–90.
- In 2014–15, 17% of adults consumed more than 2 standard drinks per day on average, exceeding the lifetime risk guideline. Men were almost 3 times as likely as women to consume alcohol at risky levels.
- In 2014–15, 50% of adults and 68% of children ate sufficient serves of fruit, and 7% of adults and 5% of children ate sufficient serves of vegetables.
- Over half (52%) of all adults aged 18–64 were not sufficiently active to gain a health benefit in 2014–15; among adults aged 65 and older, 75% were not sufficiently active.
- In 2016, 19% of injecting drug users reported using needles and syringes after someone else.
- The proportion of households with children aged 0–14 in which a person smokes inside the home fell between 1995 and 2016 (from 31% to 2.8%).
- The proportion of Australian adults who are overweight or obese was 63% in 2014–15; among children aged 5–17, it was 27%.
- In 2015–16, 2.2 million people lived on less than half the median equivalised household income (that is, less than \$427 per week), including 1.2 million people living on less than 40% of the median (\$341).
- More than two-thirds (69%) of people aged 25–64 had a non-school qualification in 2017. People living in *Major cities* and *Inner regional* areas were more likely to have a non-school qualification than people living in *Outer regional* or in *Remote* and *Very remote* areas.



Table 1.4.2: Indicators of AHPF domain—determinants of health

Trend legend			
			
Favourable	Unfavourable	No change	No data/insufficient data
AHPF dimension/Indicator	New data available	10-year trend assessment	
<b>Health behaviours</b>			
Health literacy	No	..	
Proportion of adults who are daily smokers	No		
Proportion of adults at risk of long-term harm from alcohol	No		
Fruit and vegetable intake	No	..	
Physical inactivity	No	..	
Unsafe sharing of needles	Yes		
Children exposed to tobacco smoke in the home	Yes		
<b>Personal biomedical factors</b>			
Proportion of persons obese and overweight	No	 <sup>(a)</sup>	
<b>Environmental factors</b>			
Water quality	No		
<b>Socioeconomic factors</b>			
Proportion of people with low income	Yes		
Educational attainment	Yes		

(a) The trend assessment for this indicator is based on 20 years of data (rather than 10).

## Health system

The health system domain is assessed through measures related to the quality of the health system (that is, aspects of effectiveness, safety, appropriateness, and the continuity and accessibility of care), and also by looking at the efficiency and sustainability of health care.






























The indicators reported for the health system domain are outlined in Table 1.4.3.



For more information on each indicator and to view detailed data see the online data visualisation tool at [www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/indicators-of-australias-health](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/indicators-of-australias-health).

- Overall, immunisation rates for children aged 1 and 5 have risen in recent years, though the 10-year trend for immunisation rates among 2-year-olds has shown no clear trend.
- Nearly two-thirds (65%) of females who gave birth in 2015 attended at least one antenatal visit in the first trimester of pregnancy.
- About half of all women in the relevant target age groups participated in BreastScreen Australia and the National Cervical Screening Program (55% and 56% respectively) in 2015 and 2016 combined. For the National Bowel Cancer Screening Program, 41% of invitees in targeted age groups participated in 2015 and 2016.
- In 2015–16, there were an estimated 26.4 potentially preventable hospitalisations per 1,000 people (accounting for 6.4% of all hospital separations). These are hospitalisations that are thought to have been avoidable if timely and adequate non-hospital care had been provided.
- The 5-year relative survival for all cancers combined for 2009–2013 was 68%, an increase of 20 percentage points from 48% in 1984–1988. This represents the percentage of people diagnosed with cancer who survived for at least 5 years after diagnosis, relative to people of the same age and sex in the general population.
- In 2016, there were around 27,000 potentially avoidable deaths in Australia—105 deaths per 100,000 people. This is a decrease of 45% from the rate in 1997. These are deaths from selected conditions that are considered to have been potentially preventable in the context of the present health system.
- In 2015–16, there were 5.4 adverse events per 100 hospital separations. These are incidents in which harm resulted to a person receiving health care, such as infections and problems with medication and medical devices.
- More than 148.7 million non-referred general practitioner (GP) attendances were claimed through Medicare in 2016–17 and 127.5 million (86%) of these services were bulk-billed.
- In 2016–17, the median waiting time for all admissions from the public hospital elective surgery waiting list was 38 days. Overall, Indigenous Australians had longer median waiting times than Other Australians for elective surgery (45 and 38 days respectively).
- In 2016–17, 73% of all emergency department presentations were seen within the recommended time for their triage category. Presentations triaged as *Urgent* had the lowest proportion of presentations seen on time (66%), while almost 100% of *Resuscitation* presentations were seen within the recommended time.
- The number of employed full-time equivalent medical practitioners and nurses/midwives rose (by 14% and 12% respectively) between 2011 and 2016. In 2016, the rate of full-time equivalent medical practitioners was 400 per 100,000 population; for nurse/midwives it was 1,145 per 100,000 population).

**Table 1.4.3: Indicators of AHPF domain—health system performance**

Trend legend		
		
Favourable	Unfavourable	No change
		
		No data/insufficient data
AHPF dimension/Indicator	New data available	10-year trend assessment
<b>Effectiveness</b>		
Immunisation rates for vaccines in the national schedule		
1 year	Yes	
2 years	Yes	
5 years	Yes	
Adults	No	
Proportion of pregnancies with an antenatal visit in the first trimester	Yes	
Cancer screening rates		
Breast	Yes	
Cervical	Yes	
Bowel	Yes	
Selected potentially preventable hospitalisations	Yes	
Survival of people diagnosed with cancer	Yes	 <sup>(a)</sup>
Potentially avoidable deaths	Yes	
Survival following acute coronary heart disease event <sup>(b)</sup>	—	
<b>Safety</b>		
Adverse events treated in hospital	Yes	
Falls resulting in patient harm in hospitals	Yes	
<b>Appropriateness</b>		
No indicators for this dimension		
<b>Continuity of care</b>		
Proportion of people with asthma with a written asthma action plan	No	
Proportion of people with mental illness with a GP care plan	No	
Proportion of people with diabetes with a GP annual cycle of care <sup>(b)</sup>	—	
<b>Accessibility</b>		
Bulk-billing for non-referred (GP) attendances	Yes	
Differential access to hospital procedures	Yes	
Waiting time for elective surgery	Yes	
Waiting time for emergency department care	Yes	
Selected potentially avoidable GP-type presentations to emergency departments <sup>(b)</sup>	—	
<b>Efficiency and sustainability</b>		
Cost per casemix-adjusted separation for acute and non-acute care episodes <sup>(b)</sup>	—	
Net growth in health workforce		
Medical practitioners	Yes	
Nurses and midwives	Yes	

(a) The trend assessment for this indicator is based on 30 years of data (rather than 10).

(b) Not reported here due to lack of data or agreed methodology—see section ‘Limitations of the AHPF performance indicators’.

## What is missing from the picture?

As already noted, the indicators previously agreed for reporting under the NHPF (as national-level indicators) have been reported here against the AHPF domains where suitable data are available. In the future, it is expected that the framework will be 're-populated' with a refreshed set of indicators for national reporting (also identifying indicators suitable for other levels of reporting). It will be necessary to identify information needs associated with those areas of the framework for which national-level indicators had not previously been agreed—including the 'appropriateness' component area in the health system domain, and all components of the 'health system context' domain, as these information needs were not covered by the NHPF.

## Where do I go for more information?

For more health indicators, see the [MyHealthyCommunities](#) and [MyHospitals](#) websites.

More information about the performance of health and other government services is available at [www.pc.gov.au](http://www.pc.gov.au).

More information about safety and quality monitoring of health services is available at [www.safetyandquality.gov.au](http://www.safetyandquality.gov.au).

## References

- AHMAC (Australian Health Ministers' Advisory Council) 2017. Aboriginal and Torres Strait Islander Health Performance Framework 2017 report. Canberra: AHMAC.
- AIHW (Australian Institute of Health and Welfare) 2015. Emergency department care 2014–15: Australian hospital statistics. Health services series no. 65. Cat. no. HSE 168. Canberra: AIHW.
- AIHW 2016a. Australia's health 2016. Australia's health series no. 15. Cat. no. AUS 199. Canberra: AIHW.
- AIHW 2016b. National Core Maternity Indicators data visualisations. Canberra: AIHW. Viewed 13 December 2017, <<https://www.aihw.gov.au/reports/mothers-babies/ncmi-dynamic-data-displays/contents/dynamic-data-displays>>.
- AIHW 2017. National Key Performance Indicators for Aboriginal and Torres Strait Islander primary health care: results from June 2016. National key performance indicators for Aboriginal and Torres Strait Islander primary health care series no. 4. Cat. no. IHW 177. Canberra: AIHW.
- COAG (Council of Australian Governments) 2011. National Health Reform Agreement. Canberra: Council on Federal Financial Relations. Viewed 27 March 2018, <[http://www.federalfinancialrelations.gov.au/content/npa/health/\\_archive/national-agreement.pdf](http://www.federalfinancialrelations.gov.au/content/npa/health/_archive/national-agreement.pdf)>.
- COAG 2012a. National Healthcare Agreement. Canberra: Council on Federal Financial Relations. Viewed 13 December 2017, <[http://www.federalfinancialrelations.gov.au/content/npa/health/\\_archive/healthcare\\_national-agreement.pdf](http://www.federalfinancialrelations.gov.au/content/npa/health/_archive/healthcare_national-agreement.pdf)>.
- COAG 2012b. National Indigenous Reform Agreement. Canberra: Council on Federal Financial Relations. Viewed 13 December 2017, <[http://www.federalfinancialrelations.gov.au/content/npa/health/\\_archive/indigenous-reform/national-agreement\\_sept\\_12.pdf](http://www.federalfinancialrelations.gov.au/content/npa/health/_archive/indigenous-reform/national-agreement_sept_12.pdf)>.
- NHPPC (National Health Information and Performance Principal Committee) 2017. Adelaide: COAG Health Council. The Australian Health Performance Framework. Viewed 16 February 2018, <[http://www.coaghealthcouncil.gov.au/Portals/0/OOS318\\_Attachment%201.pdf](http://www.coaghealthcouncil.gov.au/Portals/0/OOS318_Attachment%201.pdf)>.
- NHPC (National Health Performance Committee) 2002. National report on health sector performance indicators 2001. Brisbane: Queensland Health.
- SCRGSP (Steering Committee for the Review of Government Service Provision) 2018. Report on government services 2018. Canberra: Productivity Commission.

# 1.5 International comparisons

Australia matches or betters other comparable countries on many measures of health. However, there is room for improvement on some measures.

This snapshot compares Australia with other member countries of the Organisation for Economic Co-operation and Development (OECD) in 2015 (or the nearest available year of data), unless otherwise noted. These 34 other countries provide a useful comparison for Australia as most are considered to be developed countries with high-income economies.

## Health status

The health status of a population can be considered in many ways, such as by rates of illness and injury, and by measures of life expectancy and death. Compared with other OECD member countries, Australia has:

- the fifth highest life expectancy at birth for males and the eighth highest for females
- a rate of deaths due to coronary heart disease close to the OECD average
- a prevalence of dementia similar to the OECD average (Figure 1.5.1).

While life expectancies at birth for males and females in Australia have increased from 2005 to 2015, Australia's rankings among OECD member countries have dropped slightly over this time, from fourth to fifth highest for males and from fifth to eighth highest for females (OECD 2007).

The health status of a population can also be considered in terms of disability-adjusted life years (DALYs). A DALY is equivalent to a single year of 'healthy' life lost due to illness and/or death (see Chapter 3.1 'Burden of disease across the life stages'). Compared with other OECD member countries, Australia had the fourth lowest rate of DALYs in 2016 (IHME 2017).

## Determinants of health

Determinants of health are factors that influence health status, and include health behaviours and biomedical factors. Compared with other OECD member countries, Australia has:

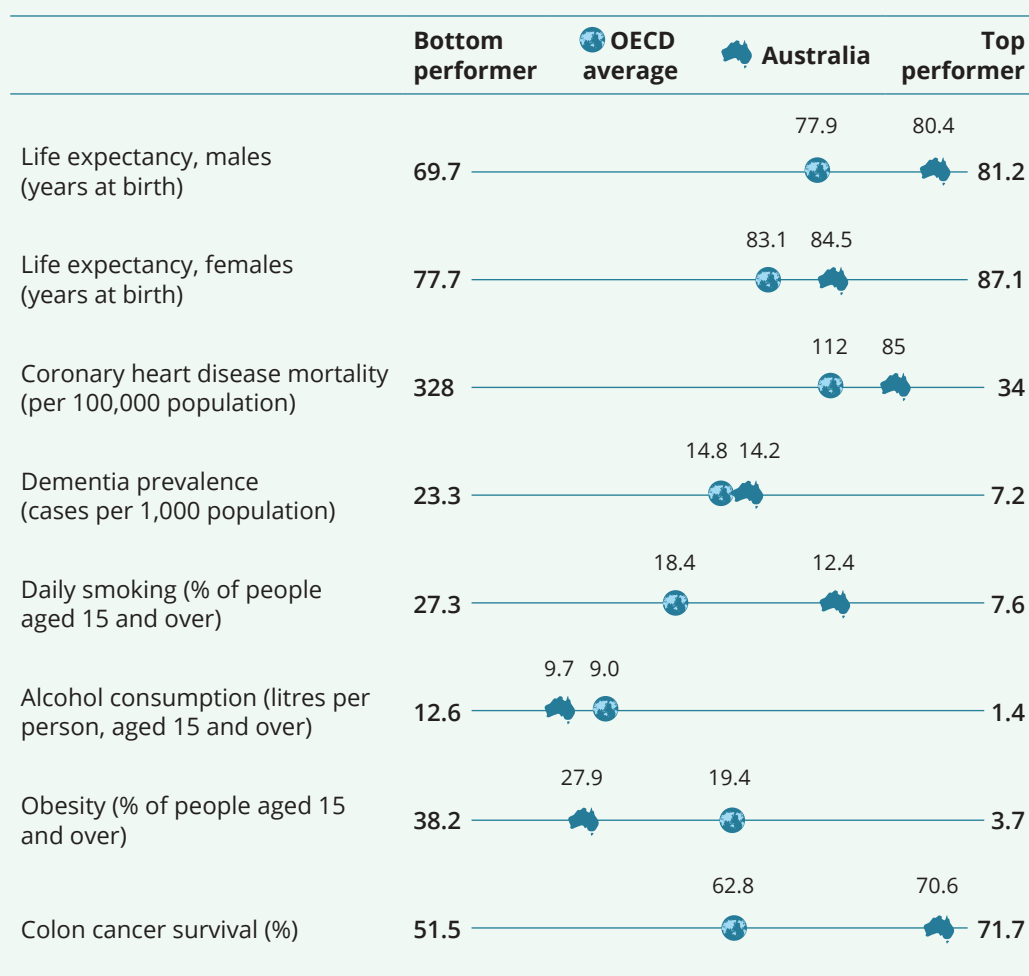
- one of the lowest rates of smoking among people aged 15 and over
- a level of alcohol consumption similar to the OECD average
- a rate of obesity among people aged 15 and over that is well above the OECD average (Figure 1.5.1).

# Health system

The performance of a health system can be assessed by looking at measures such as access to care, quality of care, and health expenditure. However, greater resources do not necessarily mean a health system performs better. Compared with other OECD member countries, Australia has:

- a level of health care expenditure per person close to the OECD average
- close to the OECD average number of practising doctors, practising nurses, and hospital beds per 1,000 population (Figure 1.5.2)
- a better than average rate of colon cancer survival, ranking third best (Figure 1.5.1)

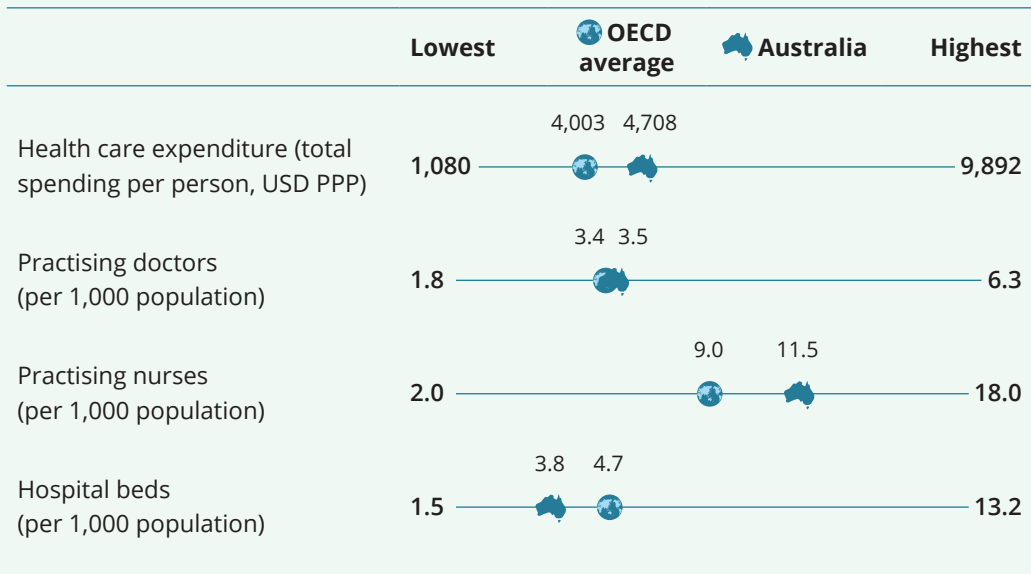
**Figure 1.5.1: Australia's performance among OECD member countries, selected indicators, 2015 (or nearest available year of data)**



*Note:* Data for Australia reflect those in the OECD.Stat database and may differ from data presented elsewhere in this report due to the potential for slight variation in data definitions and calculation methodologies.

*Source:* OECD 2017; Table S1.5.1.

**Figure 1.5.2: Comparison of Australia's health care resources as one of the 35 OECD member countries, selected indicators, 2015 (or nearest available year of data)**



USD PPP = United States dollars purchasing power parities.

*Note:* Data for Australia reflect those in the OECD.Stat database and may differ from data presented elsewhere in this report due to the potential for slight variation in data definitions and calculation methodologies.

*Source:* OECD 2017; Table S1.5.2.

## What is missing from the picture?

Making valid comparisons of health across countries can be challenging, as data collection and reporting methods can vary. Comparisons of health system performance can be particularly difficult because of the different ways health systems operate. These differences should be considered when making comparisons.

Participation in international efforts to standardise data collection and reporting, such as the development of the International Classification of Diseases 11th Revision, is an important step in improving the comparability of data between countries.

## Where do I go for more information?

More information on international health data, including other health indicators, is available at <[www.aihw.gov.au/reports-statistics/health-welfare-overview/international-comparisons/overview](http://www.aihw.gov.au/reports-statistics/health-welfare-overview/international-comparisons/overview)> and <[data.oecd.org/health.htm](http://data.oecd.org/health.htm)>.

## References

IHME (Institute for Health Metrics and Evaluation) 2017. Global Burden of Disease Study 2016 (GBD 2016) disability-adjusted life years and healthy life expectancy 1990–2016. Seattle: IHME. Viewed 22 February 2018, <<http://ghdx.healthdata.org/record/global-burden-disease-study-2016-gbd-2016-disability-adjusted-life-years-and-healthy-life>>.

OECD (Organisation for Economic Co-operation and Development) 2007. Health at a glance 2007: OECD indicators. Paris: OECD.

OECD 2017. Health at a glance 2017: OECD indicators. Paris: OECD.

## 1.6 What is missing from the picture?

The AIHW manages many important national health and welfare data collections and ensures that the information it reports is comprehensive, accurate and timely. Other government and non-government agencies also collect and report health information based on surveys, registries and administrative data collections. This information is used to inform research findings and policy decisions that improve the health and wellbeing of Australians. Despite efforts by policy, service delivery and statistical agencies, both individually and collaboratively, to develop and improve national health data, there remain opportunities to make better use of existing data and fill gaps in our knowledge.

A key issue for all data users is ensuring that information collected is used in the most effective manner; that is, turning 'big data' into 'smart data'. Information may be collected in 'silos' and may not be readily accessible or integrated or even comparable from one jurisdiction to another. Improving access to and use of existing data (see Chapter 2.5 'Secondary use of health information') would benefit Australians both through health research and through enhanced policy and service delivery. Additionally, it will allow real data gaps to be identified. This will be important for future National Healthcare Agreements, and is timely in the context of Australia's Digital Health Strategy (see Chapter 2.4 'Digital health') and, more broadly, the Australian Government's public data agenda (PM&C 2018).

However, there is currently no overarching strategic approach implemented to manage and address these gaps nationally. A strategy, with associated action plan, could improve health information assets and would be guided by policy, service delivery and research needs. This requires an understanding of the health information environment and health priority areas. The 'enhanced health data' priority associated with the current national health reform agenda (COAG 2018) provides an ideal opportunity to initiate development of a strategy and a work plan.

Individual chapters in this report describe data gaps under the 'What is missing from the picture?' headings. Some articles and snapshots list gaps that are unique to the topic or data collection. Data gaps exist where no national data are currently available or where data collected are not comprehensive. The 'What is missing from the picture?' sections may also describe analysis or research gaps that may be addressed by making better use of existing data.

This snapshot lists some of the major gaps, both data and analysis gaps, in health data and considers how they can be filled.



## Major data gaps

A number of health data gaps are identified throughout this report. These gaps include:

- primary health care data (see Box 1.6.1)
- incidence and prevalence data for certain health conditions (for example, dementia and mental health)
- the ability to measure patient pathways through the health system, including across different service types and different jurisdictions
- longitudinal data to measure outcomes related to health determinants, health conditions or health interventions
- the ability to identify some populations of interest in health data (for example, people with disability)
- geospatial information to look at locational variation in health and the effects of population growth and demographic change.

### Box 1.6.1: Gaps in primary health care data

Primary health care and hospital services each account for more than one-third of health expenditure in Australia but compared with the volume of hospital information that exists, there is a surprising lack of primary health care data. Medicare services data provide some insight into variation in use of primary health care (mostly general practice) across Australia, but do not include information about why patients visit health professionals, their diagnosis, the treatment or care they received, test results or referrals for further care. There is currently no national data that allows assessment of the appropriateness, cost-effectiveness, safety, quality and accessibility of primary health care. The cessation of the Bettering the Evaluation and Care of Health survey (which collected data on general practice visits including patient demographics, types of problems being managed and the type of care provided from 1998 to 2015–16) has enlarged the primary health care data gap. Additionally, there are no comprehensive, national data for ambulance, aeromedical, allied health or state-funded community health services.

There have been developments to improve the completeness and utility of primary health care data, including a commitment to develop a national primary care data set. Making electronic health information available for secondary use will support improved primary health care data but is not a total solution.

## Filling data gaps

The goal of filling these major health data gaps is to achieve stronger evidence for better decisions and improved health for Australians. The AIHW is working with government and non-government agencies to fill some of these gaps and make better use of existing data, including through data linkage.

Data linkage, also called data integration, is a process that combines information from multiple databases, while preserving privacy, to tell a much more powerful story than would be possible from a single source. The Productivity Commission's (2017) *Data Availability and Use, Inquiry Report* highlighted the substantial value of data linkage because it enabled 'more insights to be derived from information already collected'. Data linkage is cost-effective because it re-uses existing data, and is non-intrusive because it avoids the need to re-contact people whose information has already been collected. Data linkage is most commonly used to measure health outcomes; for example, showing that the human papillomavirus vaccination is effective in reducing cervical cancer (Gertig et al. 2013). However, it is also valuable for patient pathways—for example, hospital re-admission following a heart attack (Lopez et al. 2017)—and for identifying populations within an existing data collection.

Data linkage is increasingly being used to link across health and welfare; for example, the National Integrated Health Services Information Analysis Asset brings together aged cared with health services data (AIHW 2018). The volume and complexity of linkage projects undertaken by the AIHW continues to increase.

Much of this work centres on achieving valid and valuable person-centred data while ensuring that individual privacy is protected. Person-centred data are beneficial for insight on an individual's health situation, their treatment pathways, interactions and experiences with health care and their health outcomes, potentially leading to improved coordination and quality of care. However, individuals need to trust how their data will be handled, feel they have control over how and who will use it and see the value and benefits in its use.

## A national direction for filling data gaps

Australia's health information and data environment is changing rapidly, with increasing demands made on the collection, reporting and use of health data. There is a strong need for a strategic approach to how we manage national health data assets in Australia—a strategy that provides a desirable vision for the future of Australia's national information resources. The overall aim would be that future developments in national health data assets are more coordinated, cost-effective and tailored to current health priority areas.

This rapid change and current technological developments mean that now is the time to build on current health information work and existing infrastructure to improve how we use and share data. The AIHW is well placed to work with Australian and state and territory agencies to provide strategic direction and improve coordination. This would ensure investments are well targeted, and that new and improved data collections match national priorities.

Improved coordination and planning of health information work could assist in creating a more comprehensive list of current and future national information gaps and overlaps, as well as identifying priorities—as determined by policy and policymakers, strengthening the links between policy and outcomes. A structured, strategic approach to data and evidence is critical to support continuous improvement, innovation and progress in health—strengthening it as a 'learning system'.

## References

- AIHW (Australian Institute of Health and Welfare) 2018. Approved AIHW linkage projects. Canberra: AIHW. Viewed 19 April 2018, <<https://www.aihw.gov.au/our-services/data-linkage/approved-aihw-linkage-projects>>.
- COAG (Council of Australian Governments) 2018. Heads of Agreement between the Commonwealth and the States and Territories on public hospital funding and health reform. Canberra: Commonwealth of Australia. Viewed 2 May 2018, <<https://www.coag.gov.au/about-coag/agreements/heads-agreement-between-commonwealth-and-states-and-territories-public-0>>.
- Gertig DM, Brotherton JML, Budd AC, Drennan K, Chappel G & Saville AM 2013. Impact of a population-based HPV vaccination program on cervical abnormalities: a data linkage study. *BMC Medicine* 11:227.
- Lopez D, Nedkoff L, Knuiman M, Hobbs MST, Briffa TG, Preen DB et al. 2017. Exploring the effects of transfers and readmissions on trends in population counts of hospital admissions for coronary heart disease: a Western Australian data linkage study. *BMJ Open* 7(11). e019226. doi: 10.1136/bmjopen-2017-019226.
- PM&C (Department of the Prime Minister and Cabinet) 2018. Public data. Canberra: PM&C. Viewed 19 April 2018, <<https://www.pmc.gov.au/public-data>>.
- Productivity Commission 2017. Data availability and use, final report. Canberra: Productivity Commission.



# Chapter 2

## Australia's health system



## 2.0 Overview

This chapter looks at key aspects of the health system in Australia—how it works, who funds it, and the composition of the workforce that delivers frontline services. It also examines the importance of digital health and secondary use of health data in achieving better health outcomes for all Australians.

Every day, millions of Australians come in contact with the health system. It may be as simple as a visit to the pharmacist to pick up a prescription—or a more complex interaction, such as being admitted to hospital for surgery. The job of the health system is to respond to these individual needs by offering timely and appropriate treatment and services.

Australia's health system has different components—health promotion, primary health care, specialist services and hospitals—each supported, in turn, by a network of other organisations, including research bodies, surveillance authorities, medical boards and consumer health groups. Health care services are delivered, operated and funded by the Australian Government and state and territory governments, as well as by the private sector and not-for-profit organisations. Government departments also play a central role in health policy and service planning.

Australia's health system currently faces many challenges. These include demographic changes and the demand for health services; coordinated management of chronic conditions; greater availability and access to health data; and advances in medical research, science and technology (such as genetic testing).

Spending on health has grown in real terms (after adjusting for inflation)—by 50% between 2006–07 and 2015–16, from \$113 billion to \$170 billion. This compares with a population growth of about 17% over the same period; it means that, in 2015–16, spending on health amounted to nearly \$7,100 per person. Using Organisation for Economic Co-operation and Development (OECD) methods, Australia spends more on health as a proportion of gross domestic product (9.6%) than New Zealand (9.2%) and the OECD average (9.0%) but less than the United Kingdom (9.7%), Canada (10.6%) and the United States (17.2%).

Together, hospitals (39%) and primary health care (35%) account for three-quarters of health spending. Governments fund the majority of spending (67% or \$115 billion), and non-government sources fund the remaining \$56 billion (33%). Individuals contributed more than half (\$29 billion) of the non-government funding.

Australia has a large, diverse health workforce that includes a variety of professions, many of which are regulated by the Australian Health Practitioner Regulation Agency (AHPRA). In 2016, there were more nurses and midwives employed (315,000) than any other health care professional—more than 3 times as many as medical practitioners (91,000). Nine in 10 nurses were women, compared with 4 in 10 medical practitioners and dentists. Over the past decade, the number of women entering medical practice has grown; in 2016, more than half (53%) of employed medical practitioners under the age of 35 were women, compared with 43% in 1997.

Some occupations that play an important role in delivering health care services are not regulated by the AHPRA. For example, there are 69,000 receptionists, 25,000 nursing support and personal care workers, and 21,000 medical technicians working in the health industry.

Today, many Australians actively participate in monitoring their own health; for example, they might wear a fitness device to record how much exercise they do each day or use a smartphone to record what they eat. For health care providers, digital technology can provide opportunities to improve continuity of care—for example, by making it easier to share a person's clinical notes between all the health practitioners involved in their care. This can lead to improved quality of care.

Technology—in particular, digital technology—has had a huge impact on data generation, access and availability. So, what does happen to all the information collected on our health?

Health data can be collected for a variety of reasons: for a patient admitted to hospital, the primary reason may be to monitor their progress so that they can get the care they need. But health data can also be used for 'secondary' reasons: to provide a holistic overview of the health system and the pathways that individuals take when using health services. For example, access to health data may enable researchers to examine trends in health spending, look at potential risk factors and determinants of health and disease, or track hospital wait times.

The unprecedented volume and diversity of data currently available offer new opportunities for the secondary use of data. In health, this has the potential to lead to improved processes, increased efficiency, better targeting of resources and, ultimately, a healthier population.

## 2.1 How does Australia's health system work?

A person is likely to use the health system in various ways throughout their life. This pattern reflects their health needs at different life stages, the social and environmental impacts on their health, and personal circumstances. Some people may visit a pharmacy or general practitioner (GP) infrequently; some may have regular appointments with a GP, specialists or other health practitioners; others may need to go to hospital for tests, treatments or emergencies.

The World Health Organization describes a good health system as one that 'delivers quality services to all people, when and where they need them' (WHO 2018).

Australia's health system is a complex mix of health professionals and service providers from a range of organisations—from all levels of government and the non-government sector. Collectively, they work to meet the health care needs of all Australians. Health services are delivered in numerous ways and settings, including through health promotion and education programs, diagnosis, treatment and preventive services in the community, treatment and care in hospitals, rehabilitation in hospitals and the community, and palliative care.

A variety of organisations support these services. Health departments and other government agencies are responsible for policy and service planning. Research and statistical organisations collect and publish information on health conditions and issues (including monitoring, assessing, evaluating and reporting). Universities and health services train health professionals. Consumer and advocacy groups have a role in public debates on health policy and regulation. Voluntary and community organisations support health service functions through activities such as fundraising for research and raising awareness of health issues through education programs.

This article provides an overview of the structure of the health system in Australia and some of the many changes and challenges it currently faces.

### Delivery of health care services

The health care system has multiple components—health promotion, primary health care, specialist services and hospitals. To meet individual health care needs, a person may need—or have to engage with—the services of more than one part of the system.

### Health promotion

Health promotion focuses on preventing the root causes of ill health through activities such as governance, promoting health literacy, and population health programs. Through prevention and education programs and public awareness campaigns, health promotion is geared to educating the public on health issues, preventing avoidable health conditions



and improving the overall health of the population. Examples of health promotion include skin cancer awareness campaigns, cancer screening programs (for breast, cervical and bowel cancers), immunisation programs, alcohol and drug abuse prevention programs, anti-tobacco smoking awareness campaigns, and domestic violence education. Health promotion is an important part of primary health care. See Chapter 7.1 'Health promotion' for more information.

## Primary health care

Primary health care is often a person's first contact with the health system. It comprises a range of services that are not referred: general practice, allied health services, pharmacy and community health. Various health professionals deliver these, including GPs, nurses, allied health professionals, community pharmacists, dentists and Aboriginal and Torres Strait Islander health workers (Department of Health 2015). Primary health care can also include activities related to health promotion, prevention and early intervention, and the treatment of (and care for) acute and chronic conditions. See Chapter 7.5 'Primary health care' for more information.

Primary Health Networks are coordinating bodies that work directly with GPs, other primary health care providers, hospitals, and the broader community to increase the efficiency and effectiveness of health services and improve the coordination of care for patients moving between different services or providers (Department of Health 2016b). There are 31 Primary Health Networks across Australia, operating since 2015.

## Specialist services

Specialist services support people with specific or complex health conditions and issues, such as antenatal services for pregnancy, radiotherapy treatment for cancer and mental health services. Specialist services are generally referred by primary health care providers and often described as 'secondary' health care services. In many cases, a formal referral is required for an individual to access the recommended specialist service. There are a range of medical specialists to whom people can be referred—for example, surgeons, physicians, psychiatrists, obstetricians and gynaecologists, as well as for diagnostic services such as pathology and imaging.

## Hospitals

Hospitals are a crucial part of Australia's health system, delivering a range of services to admitted and non-admitted patients (outpatient clinics and emergency department care). See Chapter 7.7 'Overview of hospitals' for more information on hospitals.

State and territory governments largely own and manage public hospitals—which usually provide 'acute care' for short periods (although some provide longer term care, such as for some types of rehabilitation). While people needing care for a mental health problem can access specialised units of general hospitals, a small number of public psychiatric hospitals specialise in this care and sometimes provide care for long periods (AIHW 2017a).

Private hospitals are mainly owned and operated by either for-profit companies or not-for-profit organisations; they can include day hospitals as well as hospitals providing overnight care (AIHW 2017a).

Local Hospital Networks are state and territory authorities set up to manage public hospital services and funding. All public hospitals in Australia are part of a Local Hospital Network. Currently, there are 136 of these networks in Australia—122 are geographically based networks and 14 are state-wide or territory-wide networks that may deliver specialised hospital services across some jurisdictions (AIHW 2017d). 'Local Hospital Networks' is the term used nationally; terms used in states and territories for these networks vary.

## Responsibility for the health system

Australia's health system may be more accurately described as various connected health systems, rather than one unified system. The Australian Government, state and territory governments and local governments share responsibility for it, including for its operation, management and funding. While the overarching framework for the health system is laid out by government, the private sector also operates and funds some health services. These include operating private hospitals, pharmacies and many medical practices, as well as funding through private health insurance.

The structure of the health system has its roots in Australia's federal system of government, which initially left the states with primary responsibility for providing health services, including public hospital services. Changes to the Constitution in 1946 allowed the Australian Government to become involved in the funding of public hospital services (Biggs 2003). This resulted in the funding, operational and regulatory arrangements that exist today between the Australian Government and state and territory governments.

Intergovernmental agreements, such as the National Health Reform Agreement 2011, have continued to reshape the health system in recent years (Duckett 2017; Glance 2017). All Australian health ministers are members of the Council of Australian Governments (COAG) Health Council—the forum for cooperation on health issues and the health system (COAG Health Council 2014).

## Roles of each level of government

The main roles of each level of government in Australia's health system are as described here:

- The Australian Government is responsible for leading the development of national health policy, administering Medicare (including funding GP and private medical services), providing funds to states and territories for public hospital services, providing oversight of Primary Health Networks, funding medicines through the Pharmaceutical Benefits Scheme, regulating private health insurance, funding community-controlled Indigenous primary health care, organising health services for veterans and funding health and medical research.

- State and territory governments are responsible for funding and managing public hospitals, regulating and licensing private hospitals, providing oversight of local health networks, delivering public community-based and primary health services, delivering preventive services such as cancer screening and immunisation programs, ambulance services and health complaints services.
- Local governments, in some jurisdictions, are responsible for environmental health-related services such as waste disposal and water fluoridation, community and home-based health and support services and delivery of health promotion activities.

The three levels of government also share some responsibilities, including education and training of health professionals, regulation of health workforces, improvements in safety and quality of health care, and funding of health programs and services (Biggs 2013a; Duckett & Willcox 2015; PM&C 2014).

## Funding arrangements

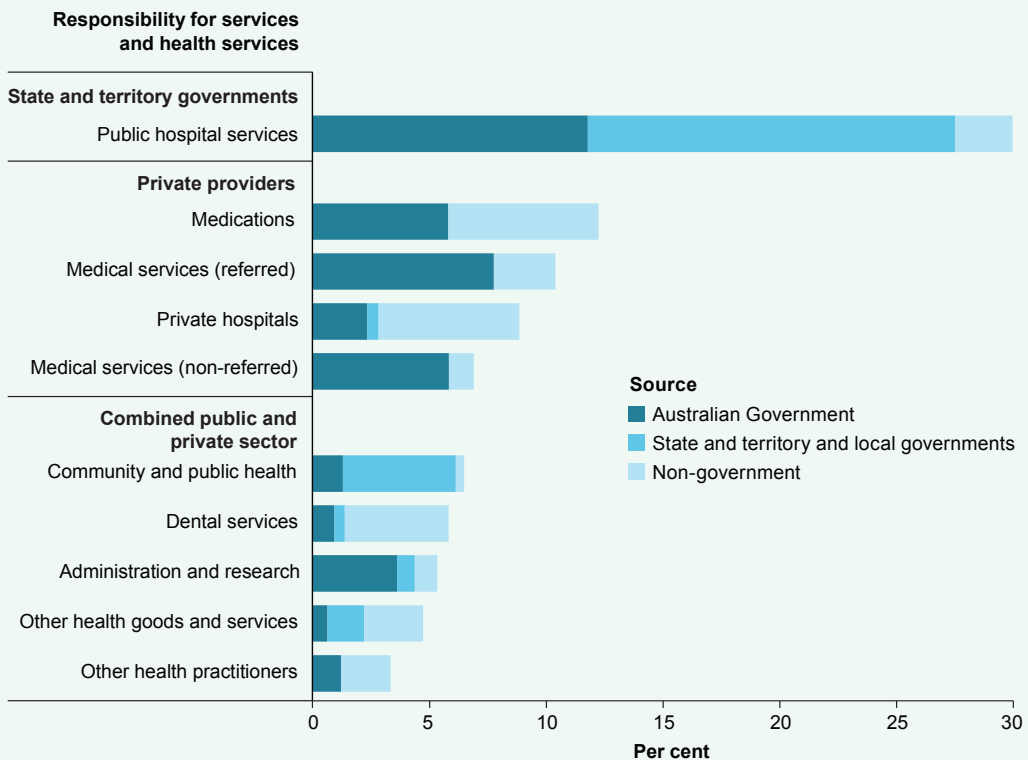
The complex structure of Australia's health system is reflected in its funding arrangements. The health system is funded by all levels of government. Funding also comes from non-government organisations, private health insurers, and individuals when they pay for some products and services without full, or with only partial, reimbursement.

In 2015–16, an estimated \$170 billion was spent on health in Australia—10% of gross domestic product (AIHW 2017c). Total government spending accounted for two-thirds (67%) of health expenditure, and non-government sources funded the remaining third (33%). Individuals funded 17% of total health expenditure in 2015–16 through out-of-pocket expenses, mostly on primary health care, dental services and non-subsidised medicines; private health insurers funded 8.8% (AIHW 2017c).

The Australian Government and state and territory governments funded 41% and 26% of total health expenditure, respectively (AIHW 2017c). The Australian Government usually provides the majority of funding for medical services and subsidised medicines. State and territory governments fund most of the total expenditure for community health services. Funding of public hospital services is shared between the Australian Government and state and territory governments. Government spending accounted for most of the \$5.2 billion spent on health research in Australia in 2015–16 (AIHW 2017c).

Figure 2.1.1 shows the funding sources and responsibilities for the various components of Australia's health system. The figure makes it clear that funding of any part of the system does not necessarily correlate with responsibility for its management or operation. For example, the Australian Government partially funds public hospitals, but is not responsible for managing or regulating them; this is the responsibility of state and territory governments.

**Figure 2.1.1: Health services—responsibility, funding sources and proportion of expenditure, 2015–16**



*Note:* The figure does not show responsibility, funding sources or proportion of health expenditure for capital expenditure and medical expenses tax rebate.

*Source:* AIHW 2017c (Table A6); Table S2.1.1.

See Chapter 2.2 'How much does Australia spend on health care' for more information on funding of the health system.

## Medicare

Australia's health system is underpinned by Medicare—a universal public health insurance scheme. Medicare is funded by the Australian Government through general taxation revenue and a 2% Medicare levy (ATO 2017a; Biggs 2016a). Intergovernmental agreements for public hospital funding between the Australian Government and state and territory governments guarantee Medicare cardholders access to fee-free treatment as public patients in public hospitals (Boxall 2014). Medicare also covers a portion of the Medicare Benefits Schedule fee for medical services and procedures, and Medicare cardholders have access to a range of prescription pharmaceuticals subsidised under the Pharmaceutical Benefits Scheme (Biggs 2016a; Department of Health 2018; DHS 2017a). See Chapter 7 for more information.

Some medical and allied health services are not subsidised through Medicare. For example, Medicare does not usually cover costs for ambulance services, most dental examinations and treatments, physiotherapy and optical aids (such as glasses and contact lenses).

Not everyone in Australia can access Medicare. Currently, it is available only to Australian and New Zealand citizens, permanent residents in Australia, and people from countries with reciprocal agreements (DHS 2017b, 2017c). Most people outside these categories have to pay full fees for health services or take out private health insurance (PrivateHealth 2017c).

## Private health insurance

Private health insurance is an option for managing health care expenses. People can choose the type of cover to buy. The two types of cover available are:

- hospital cover for some (or all) of the costs of hospital treatment as a private patient
- general treatment ('ancillary' or 'extras') cover for some non-medical health services not covered by Medicare—such as dental, physiotherapy and optical services (Department of Health 2017d; PrivateHealth 2017d).

As at June 2017, 11.3 million Australians (46% of the population) had some form of private patient hospital cover, and 13.5 million (55%) had some form of general treatment cover (APRA 2017).

Private health insurance works in tandem with the publicly funded system. Part of the cost of hospital admission as a private patient is covered by Medicare (the medical fee) and part can be covered by insurance (Boxall 2014). A person with private health insurance can also choose to be treated as a public patient in a public hospital (PrivateHealth 2017e).

The Australian Government offers a means-tested rebate to people who hold private health insurance; the intent is to reduce pressure on the publicly funded system by encouraging people to take up private health insurance (PrivateHealth 2017a). Further, the Medicare levy surcharge is imposed on people who earn above a specified income threshold and do not have private health insurance (ATO 2017b; PrivateHealth 2017b).

## Regulation and consumer protections

The Australian Government and state and territory governments are responsible for health system regulation. Various regulatory agencies within the system work to ensure that acceptable standards and quality of care and services are met, and that people are protected when using health goods and services and when dealing with health professionals. These objectives align with the Australian Charter of Healthcare Rights (see Box 2.1.1).

The Australian Government regulates the safety and quality of pharmaceutical and therapeutic goods and appliances. The Therapeutic Goods Administration is responsible for regulating therapeutic goods, including prescription medicines, vaccines, sunscreens, vitamins and minerals, medical devices, blood and blood products (TGA 2017).

State and territory governments manage and administer public hospitals; regulate and license private hospitals; license pharmacies; and regulate, inspect, license and monitor health premises (Biggs 2013a). They are also responsible for regulating industries that affect individual and population/community health, such as the sale and supply of alcohol and tobacco (AIHW 2016).

The different levels of government share responsibility for regulating food standards, the safety and quality of health care, and the health workforce. The Australian Commission on Safety and Quality in Health Care—established by the Australian Government and state and territory governments—sets safety and quality standards to improve the quality of health care in Australia. This includes clinical care standards and national standards in mental health services (ACSQHC 2017b). See Chapter 7.9 ‘Safety and quality of hospital care’ for more information.

### **Box 2.1.1: The right to health and the Australian Charter of Healthcare Rights**

The right to health was first included in the preamble to the World Health Organization Constitution in 1946. It is enshrined in the international human rights framework, recognising the ‘right of everyone to the enjoyment of the highest attainable standard of physical and mental health’ (ICESCR 1966). However, the right to health is not the same as the right to be healthy—it refers to the right to ‘the enjoyment of a variety of goods, facilities, services and conditions necessary for its realisation’ (WHO 2008).

The Australian Charter of Healthcare Rights was endorsed by Australian and state and territory health ministers in 2008 (ACSQHC 2017a). The Charter describes the key rights of patients and health consumers who seek or receive health services. It was developed by the Australian Commission on Safety and Quality in Health Care to support the provision of safe and high-quality health care by educating patients, families and those working in the health system about their rights to health care.

The seven rights in the Charter apply to anywhere health care is delivered, and relate to:

- Access—the right to health care
- Safety—the right to safe and high-quality care
- Respect—the right to be shown respect, dignity and consideration
- Communication—the right to be informed about services, treatment, options and costs in a clear and open way
- Participation—the right to be included in decisions and choices about care
- Privacy—the right to privacy and confidentiality of personal information
- Comment—the right to comment on care and to have concerns dealt with.

The application of the Charter to the health system is informed by three guiding principles:

- (i) the right of everyone to access health care
- (ii) the commitment of the Australian Government to international agreements recognising the right to health
- (iii) the acknowledgement of and respect for the different cultures and ways of life in Australian society.

While the Charter is not enforceable, it reflects accepted standards and expectations.

For more information, see <[www.safetyandquality.gov.au/national-priorities/charter-of-healthcare-rights](http://www.safetyandquality.gov.au/national-priorities/charter-of-healthcare-rights)>.

The regulation of the health system includes the registration of health professionals. The National Registration and Accreditation Scheme was established to ensure that only suitably trained and qualified health practitioners are registered. The scheme is implemented by national boards and supported by the Australian Health Practitioner Regulation Agency (AHPRA). Currently, 14 health professions are covered, including medical practitioners, nurses, dental practitioners, optometrists, psychologists, pharmacists and physiotherapists (AHPRA 2015). The scheme aims to protect the public and provide access to safer health care by regulating health practitioners (AHPRA 2017a). As well, a National Code of Conduct for non-registered health care workers was approved by the Australian and state and territory health ministers in 2015 (Department of Health 2016a).

Complaints handling mechanisms play a key role in regulating the health system. State and territory health complaints organisations handle complaints about health service providers (individuals and organisations) and work with AHPRA for complaints about registered health practitioners (AHPRA 2017b). The Office of the Australian Information Commissioner takes complaints about privacy breaches of health information and data (OAIC 2017). The Private Health Insurance Ombudsman handles complaints about private health insurers (Commonwealth Ombudsman 2017). As well, complaints handling mechanisms are available to people who have been discriminated against in the provision of and/or access to health services through the various anti-discrimination bodies at both the federal and state and territory levels.

## Health and welfare links

A person's health is not isolated from other facets of their life; it is tied to their social, economic and individual circumstances. In a similar way, the health system is connected to other sectors, particularly to welfare. Some examples of this nexus between health and welfare at the service, policy and program levels are the National Disability Insurance Scheme (NDIS) and child care services.

The NDIS uses an insurance-based model to provide individualised support to people with disability. It has markedly changed how services are delivered, requiring people to navigate multiple systems—such as health, disability and housing—and to interact with various government and non-government personnel. See Chapter 5.4 'People with disability' for more information.

Government policies that seek to influence people's behaviour or respond to a concern can also affect health and welfare outcomes. In 2015, concern about low childhood vaccination rates in some pockets of the country saw the Australian Government implement a 'No Jab, No Pay' policy—to encourage parents to vaccinate their children in order to be eligible for child care rebates (Klapdor & Grove 2015). In 2017, laws were passed in New South Wales, Victoria and Queensland, and introduced in South Australia, to give effect to the 'No Jab, No Play' policy, preventing children who have not been vaccinated from attending child care (NCIRS 2017; SA Parliament 2017). See Chapter 7.2 'Immunisation and vaccination' for more information on vaccination.

Further, there is a recognised association between poorer health outcomes and lower socioeconomic position, and other forms of disadvantage (ACOSS 2017; Marmot 2016). For example, people with mental health conditions and those who have experienced family, domestic or sexual violence are most likely to be clients of specialist housing services (AIHW 2017b). See Chapter 4.2 'Social determinants of health' for more information.

# Changes and challenges to the health system

Health systems are not static but adjust and change to accommodate demographic, social, economic, environmental and technological changes. Challenges currently faced by the Australian health system include:

- demographic changes and the demand for health services
- coordinated management of chronic conditions
- greater availability of and access to health data
- advances in medical research, science and technology.

This section briefly discusses some of these complex challenges facing the health system.

The *2015 Intergenerational Report: Australia in 2055* presents a complex picture of Australia's health care needs over the next 4 decades: changes to the structure of Australia's population over this time will have implications for demand for health services (Department of the Treasury 2015). A greater proportion of the population is projected to be aged 65 and over by 2054–55, alongside a smaller proportion of traditional working age (ages 15–64).

With increasing life expectancy and improvements in health, people are more likely to remain active for longer, and 'active ageing' may see older Australians participate in the workforce and in the community for longer (AIHW 2017e; Department of the Treasury 2015). However, many health conditions and associated disability become more common with age, and older Australians are higher users of health services than younger Australians (AIHW 2016). For example, while people are living longer and healthier lives, the prevalence of health conditions associated with ageing, such as dementia, is projected to increase (see Chapter 3.14 'Dementia').

The health system will need to accommodate changes in the demand for health services. This may mean a demand for different types of health services for a healthier older population to maintain good health, while continuing to provide support and services for those affected by health conditions associated with old age (AIHW 2017b, 2017e). These multiple demands on the health system will require a health workforce that can meet such diverse needs.

Managing chronic conditions is another challenge to the health system (Duckett 2017; Productivity Commission 2017) as these conditions represent a substantial burden in Australia (see Chapter 3.3 'Chronic conditions'). The rising prevalence of many chronic conditions and the growing number of patients with complex comorbidities increase the demand for flexible, person-centred treatment models. Mental health is an example of a need for a care model that provides care options of varying intensity to suit people with differing needs (Biggs 2016b; NMHC 2014).

To tackle this issue, the Australian Government and state and territory governments are taking a national approach to coordinated care under the National Health Reform Agreement (COAG Health Council 2016; Productivity Commission 2017). As well, the Health Care Homes initiative aims to provide better coordination and continuity of care



for patients with chronic and complex conditions through a team of health professionals who develop a shared care plan for the patient (Department of Health 2017a).

Nonetheless, coordination of care remains a challenge, particularly where patient health and medical information are not shared between providers (Glance 2017). See Chapter 7.18 'Coordination of health care' for more information.

Access to more data and their effective use is important in providing the evidence for action on, and changes to, health policy, programs and services. Linking different health information across the health system for use in health care provision presents both opportunities and challenges. My Health Record is an attempt to improve services to patients by tackling the problems of information sharing across different sectors. It will also create the potential for access to far richer health data that can greatly help to deliver a higher standard of clinical care and coordination. See chapters 2.4 'Digital health'; 2.5 'Secondary use of health information' for more information.

Advances in medical science, and genomics in particular, have seen a growth in genetic testing services, including in Australia (Aubusson 2017; Vinkhuyzen & Wray 2017). Genomic testing has the potential for early diagnosis of a range of health conditions and diseases, as well as prevention and treatment options for people able access these services (Amor 2017). Genomic testing services pose many ethical and potentially legal considerations, including the high cost to consumers, whether the tests actually inform treatment options, the impact on a healthy person of discovering a predisposition to a certain disease, privacy issues, and how such information may be used by insurance companies (Amor 2017; Vinkhuyzen & Wray 2017).

Technological innovations are also having an impact on health and medical services—from digital health technologies, to the potential use of automated dispensing machines for medicines (Dickinson 2017), through to medical artificial intelligence for diagnostic testing (Oakden-Rayner 2017). These technologies may provide efficiencies and improvements for the health system, but they have implications for patients and the health workforce.

To meet some of these challenges facing the Australian health system, the Australian Government has invested in medical research and technological innovation through the Medical Research Future Fund. The fund complements current research and innovation funding to improve health outcomes (Department of Health 2017c). As well, the Australian Government is investing in information technology and infrastructure to support the health system by replacing the IT system used to deliver Medicare payments in order to improve efficiency and outcomes (Department of Health 2017b).

Other systemic challenges include the rising cost of the health system for governments and individuals (AIHW 2017c; Biggs 2013b, 2016b), the ability to respond to emerging health issues (for example, thunderstorm asthma) (Davies et al. 2017), disparities in access to health services (Biggs 2016a; Russell 2017) and elective surgery and emergency department waiting times (Duckett 2017). These challenges are not unique to Australia, though, and several countries face very similar issues with their health systems.

## What is missing from the picture?

The health system provides necessary health services and supports efforts to improve and maintain the health of individuals and the population. Two key elements for improving services and better meeting individual health needs, are understanding their experiences as patients and consumers of health services, and tracking individual pathways through the health system. There are still considerable challenges in being able to track patient experiences and individual pathways through the health system. Data linkage can improve the understanding of pathways through the health system.

## Where do I go for more information?

Individual aspects of the health system are discussed in more detail throughout this report.

More information on primary health is available on the AIHW website at [www.aihw.gov.au](http://www.aihw.gov.au) and [www.myhealthycommunities.gov.au](http://www.myhealthycommunities.gov.au).

Detailed information on Australian hospitals is available at [www.aihw.gov.au/reports-statistics/health-welfare-services/hospitals/overview](http://www.aihw.gov.au/reports-statistics/health-welfare-services/hospitals/overview) and [www.myhospitals.gov.au](http://www.myhospitals.gov.au).

Detailed information on health spending and the health workforce are available at [www.aihw.gov.au/reports-statistics/health-welfare-overview/health-welfare-expenditure/overview](http://www.aihw.gov.au/reports-statistics/health-welfare-overview/health-welfare-expenditure/overview) and [www.aihw.gov.au/reports-statistics/health-welfare-services/workforce/overview](http://www.aihw.gov.au/reports-statistics/health-welfare-services/workforce/overview), respectively.

More information on health reform, health practitioner registration and Australian Government health policies is available from the Department of Health website at [www.health.gov.au](http://www.health.gov.au).

More information on health services and health system regulation in states and territories is available from the various state and territory health department websites.

More information on intergovernmental agreements is available at the COAG Health Council website at [www.coaghealthcouncil.gov.au](http://www.coaghealthcouncil.gov.au).

## References

- ACOSS (Australian Council of Social Service) 2017. Health. Sydney: ACOSS. Viewed 27 November 2017, <http://www.acoss.org.au/health/>.
- ACSQHC (Australian Commission on Safety and Quality in Health Care) 2017a. Australian Charter of Healthcare Rights. Sydney: ACSQHC. Viewed 1 December 2017, <https://www.safetyandquality.gov.au/national-priorities/charter-of-healthcare-rights/>.
- ACSQHC 2017b. Our work. Sydney: ACSQHC. Viewed 8 December 2017, <https://www.safetyandquality.gov.au/our-work/>.
- AHPRA (Australian Health Practitioner Regulation Agency) 2015. AHPRA FAQ. 27 August 2015. Melbourne: AHPRA. Viewed 1 December 2017, <http://www.ahpra.gov.au/About-AHPRA/What-We-Do/FAQ.aspx>.
- AHPRA 2017a. National Registration and Accreditation Scheme Strategy 2015–20. 16 October 2017. Melbourne: AHPRA. Viewed 23 November 2017, <http://www.ahpra.gov.au/About-AHPRA/What-We-Do/NRAS-Strategy-2015-2020.aspx>.
- AHPRA 2017b. Other health complaints organisations. 18 October 2017. Melbourne: AHPRA. Viewed 21 November 2017, <http://www.ahpra.gov.au/Notifications/Further-information/Health-complaints-organisations.aspx>.
- AIHW (Australian Institute of Health and Welfare) 2016: Australia's health 2016. Australia's health series no.15. Cat. no. AUS199. Canberra: AIHW.

AIHW 2017a. Australia's hospitals at a glance 2015–16. Health services series no. 77. Cat. no. HSE 189. Canberra: AIHW.

AIHW 2017b. Australia's welfare 2017. Australia's welfare series no. 13. AUS 214. Canberra: AIHW.

AIHW 2017c. Health expenditure Australia 2015–16. Health and welfare expenditure series no. 58. Cat. no. HWE 68. Canberra: AIHW.

AIHW 2017d. METeOR (Metadata Online Registry). Establishment—local hospital network identifier, code NNN. Canberra: AIHW. Viewed 4 December 2017, <<http://meteor.aihw.gov.au/content/index.phtml/itemId/680985>>.

AIHW 2017e. Older Australians at a glance: web report. 21 April 2017. Canberra: AIHW. Viewed 4 March 2018, <<https://www.aihw.gov.au/reports/older-people/older-australia-at-a-glance/contents/demographics-of-older-australians>>.

Amor D 2017. Gene testing for the public: a way to ward off disease, or a useless worry? 22 June 2017. Melbourne: The Conversation. Viewed 28 February 2018, <<https://theconversation.com/gene-testing-for-the-public-a-way-to-ward-off-disease-or-a-useless-worry-79757>>.

APRA (Australian Prudential Regulation Authority) 2017. Private health insurance membership and coverage (September 2017). Sydney: APRA.

ATO (Australian Taxation Office) 2017a. Medicare levy. 18 October 2017. Canberra: ATO. Viewed 24 November 2017, <<https://www.ato.gov.au/Individuals/Medicare-levy/>>.

ATO 2017b. Medicare levy surcharge. 29 June 2017. Canberra: ATO. Viewed 8 December 2017, <<https://www.ato.gov.au/Individuals/Medicare-levy/Medicare-levy-surcharge/>>.

Aubusson K 2017. Australian-first whole genome sequencing and health testing open to public. 19 June 2017. Sydney: The Sydney Morning Herald. Viewed 1 March 2018, <<https://www.smh.com.au/healthcare/australianfirst-whole-genome-sequencing-and-health-testing-open-to-public-20170619-gwtsgm.html>>.

Biggs A 2003. Hospitals in Australia. Canberra: Department of Parliamentary Services. Viewed 11 December 2017, <[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Publications\\_Archive/archive/Hospitals](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Publications_Archive/archive/Hospitals)>.

Biggs A 2013a. Health in Australia: a quick guide. Canberra: Department of Parliamentary Services. Viewed 6 March 2018, <[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/pubs/rp/rp1314/QG/HealthAust](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/rp1314/QG/HealthAust)>.

Biggs A 2013b. Sustainable funding of health care: challenges ahead. Canberra: Department of Parliamentary Services. Viewed 4 February 2018, <[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/pubs/BriefingBook44p/FundingHealthCare](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/BriefingBook44p/FundingHealthCare)>.

Biggs A 2016a. Medicare: a quick guide. 12 July 2016. Canberra: Department of Parliamentary Services. Viewed 27 October 2017, <[http://parlinfo.aph.gov.au/parlInfo/download/library/prspub/4687808/upload\\_binary/4687808.pdf;fileType=application%2Fpdf#search=%22library/prspub/4687808%22](http://parlinfo.aph.gov.au/parlInfo/download/library/prspub/4687808/upload_binary/4687808.pdf;fileType=application%2Fpdf#search=%22library/prspub/4687808%22)>.

Biggs A 2016b. Medicare and health system challenges. August 2016. Canberra: Department of Parliamentary Services. Viewed 8 December 2017, <[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/pubs/BriefingBook45p/MedicareChallenges](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/BriefingBook45p/MedicareChallenges)>.

Boxall A 2014. Explainer: what is Medicare and how does it work? 31 July 2014. Melbourne: The Conversation. Viewed 8 December 2017, <<https://theconversation.com/explainer-what-is-medicare-and-how-does-it-work-22523>>.

COAG (Council of Australian Governments) Health Council 2014. COAG Health Council 2014 Terms of Reference. Canberra: COAG.

COAG Health Council 2016. COAG Health Council meeting communique – 7 October 2016. Canberra: COAG.

Commonwealth Ombudsman 2017. Private Health Insurance Ombudsman. Canberra: Commonwealth Ombudsman. Viewed 22 November 2017, <<http://www.ombudsman.gov.au/about/private-health-insurance>>.

Davies J, Thien F & Hew M 2017. Thunderstorm asthma: who's at risk and how to manage it. 6 November 2017. Melbourne: The Conversation. Viewed 20 November 2017, <<https://theconversation.com/thunderstorm-asthma-whos-at-risk-and-how-to-manage-it-86397>>.

Department of Health 2015. Primary care. 14 July 2015. Canberra: Department of Health. Viewed 24 November 2017, <<http://www.health.gov.au/internet/main/publishing.nsf/Content/primarycare>>.

- Department of Health 2016a. National Registration and Accreditation Scheme (NRAS). 2 February 2016. Canberra: Department of Health. Viewed 23 November 2017, <<http://www.health.gov.au/internet/main/publishing.nsf/content/work-nras>>.
- Department of Health 2016b. Primary Health Networks (PHNs). 23 September 2016. Canberra: Department of Health. Viewed 23 November 2017, <<http://www.health.gov.au/internet/main/publishing.nsf/Content/PHN-Home>>.
- Department of Health 2017a. Health Care Homes. 10 October 2017. Canberra: Department of Health. Viewed 23 November 2017, <<http://www.health.gov.au/internet/main/publishing.nsf/Content/health-care-homes>>.
- Department of Health 2017b. Modernising Health and Aged Care Payments Services Program. Canberra: Department of Health. Viewed 4 February 2018, <<http://www.health.gov.au/internet/main/publishing.nsf/Content/medicare-aged-care-payments-transformation-program>>.
- Department of Health 2017c. Overview of the Medical Research Future Fund. 22 December 2017. Canberra: Department of Health. Viewed 31 January 2018, <<http://www.health.gov.au/internet/main/publishing.nsf/Content/medical-research-future-fund-mrff-overview-budget-2017>>.
- Department of Health 2017d. What is private health insurance? 31 January 2017. Canberra: Department of Health. Viewed 31 January 2018, <<http://www.health.gov.au/internet/main/publishing.nsf/Content/health-privatehealth-whatisPHI>>.
- Department of Health 2018. About the PBS. 1 January 2018. Canberra: Department of Health. Viewed 11 January 2018, <<http://www.pbs.gov.au/info/about-the-pbs>>.
- Department of the Treasury 2015. 2015 intergenerational report: Australia in 2055. Canberra: Department of the Treasury.
- DHS (Department of Human Services) 2017a. Medicare services. 27 August 2017. Canberra: DHS. Viewed 23 November 2017, <<https://www.humanservices.gov.au/individuals/subjects/medicare-services>>.
- DHS 2017b. RHCA—medical care for visitors to Australia. 9 November 2017. Canberra: DHS. Viewed 24 November 2017, <<https://www.humanservices.gov.au/individuals/enablers/rhca-medical-care-visitors-australia>>.
- DHS 2017c. Who can get a Medicare card? 9 November 2017. Canberra: Department of Human Services. Viewed 23 November 2017, <<https://www.humanservices.gov.au/individuals/enablers/who-can-get-medicare-card>>.
- Dickinson H 2017. Replacing pharmacists with robots isn't the answer to better productivity. 25 October 2017. Melbourne: The Conversation. Viewed 2 March 2018, <<https://theconversation.com/replacing-pharmacists-with-robots-isnt-the-answer-to-better-productivity-86231>>.
- Duckett S 2017. Australia's health system is enviable, but there's room for improvement. 22 September 2017. Melbourne: The Conversation. Viewed 27 October 2017, <<https://theconversation.com/australias-health-system-is-enviable-but-theres-room-for-improvement-81332>>.
- Duckett S & Willcox S 2015. The Australian health care system. 5th edn. South Melbourne: Oxford University Press.
- Glance D 2017. It's complicated. The OECD details problems with Australia's health care system. 17 November 2017. Melbourne: The Conversation. Viewed 27 November 2017, <<https://theconversation.com/its-complicated-the-oecd-details-problems-with-australias-health-care-system-50773>>.
- ICESCR (International Covenant on Economic, Social and Cultural Rights) 1966. Article 12(1). Geneva: Office of the United Nations High Commissioner for Human Rights.
- Klapdor M & Grove A 2015. 'No jab, no pay' and other immunisation measures. Canberra: Department of Parliamentary Services. Viewed 29 November 2017, <[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/pubs/rp/BudgetReview201516/Vaccination](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/BudgetReview201516/Vaccination)>.
- Marmot M 2016. 2016 Boyer Lectures: fair Australia: social justice and the health gap. Sydney: Australian Broadcasting Corporation.
- NCIRS (National Centre for Immunisation Research and Surveillance) 2017. No jab no play, No jab no pay policies. August 2017. Sydney: NCIRS. Viewed 6 March 2018, <<http://www.ncirs.edu.au/consumer-resources/no-jab-no-play-no-jab-no-pay-policies/>>.
- NMHC (National Mental Health Commission) 2014. The national review of mental health programmes and services. Sydney: NMHC.

- OAIC (Office of the Australian Information Commissioner) 2017. Health information and medical research. Sydney: OAIC. Viewed 24 November 2017, <<https://www.oaic.gov.au/privacy-law/privacy-act/health-and-medical-research>>.
- Oakden-Rayner L 2017. Artificial intelligence won't replace a doctor any time soon, but it can help with diagnosis. 19 September 2017. Melbourne: The Conversation. Viewed 5 March 2018, <<https://theconversation.com/artificial-intelligence-wont-replace-a-doctor-any-time-soon-but-it-can-help-with-diagnosis-83353>>.
- PM&C (Department of the Prime Minister and Cabinet) 2014. Reform of the Federation white paper. Issues paper 3: Roles and responsibilities in health. 11 December 2014. Canberra: PM&C.
- PrivateHealth (PrivateHealth.gov.au) 2017a. Australian Government private health insurance rebate. Canberra: Office of the Private Health Insurance Ombudsman. Viewed 8 December 2017, <<https://www.privatehealth.gov.au/healthinsurance/incentivessurcharges/insurancerebate.htm>>.
- PrivateHealth 2017b. Medicare levy surcharge. Canberra: Office of the Private Health Insurance Ombudsman. Viewed 8 December 2017, <<https://www.privatehealth.gov.au/healthinsurance/incentivessurcharges/mls.htm>>.
- PrivateHealth 2017c. Overseas visitors & overseas students. Canberra: Office of the Private Health Insurance Ombudsman. Viewed 24 November 2017, <<https://www.privatehealth.gov.au/healthinsurance/overseas/>>.
- PrivateHealth 2017d. What is covered? Canberra: Office of the Private Health Insurance Ombudsman. Viewed 24 November 2017, <<https://www.privatehealth.gov.au/healthinsurance/whatiscovered/default.htm>>.
- PrivateHealth 2017e. What is covered by Medicare? Canberra: Office of the Private Health Insurance Ombudsman. Viewed 24 November 2017, <<https://www.privatehealth.gov.au/healthinsurance/whatiscovered/medicare.htm>>.
- Productivity Commission 2017. Shifting the dial: 5 year productivity review. Melbourne: Productivity Commission.
- Russell L 2017. When second best isn't good enough. 18 July 2017. Croakey. Viewed 27 October 2017, <<https://croakey.org/when-second-best-isnt-good-enough-australias-health-system-ranks-highly-on-all-but-equity/>>.
- SA Parliament (Parliament of South Australia) 2017. SA legislative tracking. Adelaide: Parliament of South Australia. Viewed 6 March 2018, <<http://www.parliament.sa.gov.au/LEGISLATION/BILLSMOTIONS/SALT/Pages/default.aspx?SaltPageTypeId=2&SaltRecordTypeId=0&SaltRecordId=4203&SaltBillSection=2>>.
- TGA (Therapeutic Goods Administration) 2017. Who we are & what we do. Canberra: Department of Health. Viewed 11 December 2017, <<http://www.tga.gov.au/who-we-are-what-we-do>>.
- Vinkhuyzen A & Wray N 2017. Why we should test everyone's genes to predict disease. 24 October 2017. Melbourne: The Conversation. Viewed 5 March 2018, <<https://theconversation.com/why-we-should-test-everyones-genes-to-predict-disease-83146>>.
- WHO (World Health Organization) 2008. Constitution of WHO: principles. Geneva: WHO. Viewed 1 December 2017, <<http://www.who.int/about/mission/en/>>.
- WHO 2018. Health systems. Geneva: WHO. Viewed 28 January 2018, <[http://www.who.int/topics/health\\_systems/en/](http://www.who.int/topics/health_systems/en/)>.

## 2.2 How much does Australia spend on health care?

Health expenditure is money spent on health goods and services. It includes money spent by governments as well as by individuals and other non-government funders, such as private health insurers. The money is spent so that health goods and services can be provided by hospitals, primary health care providers (such as general practitioners), other health professionals and others.

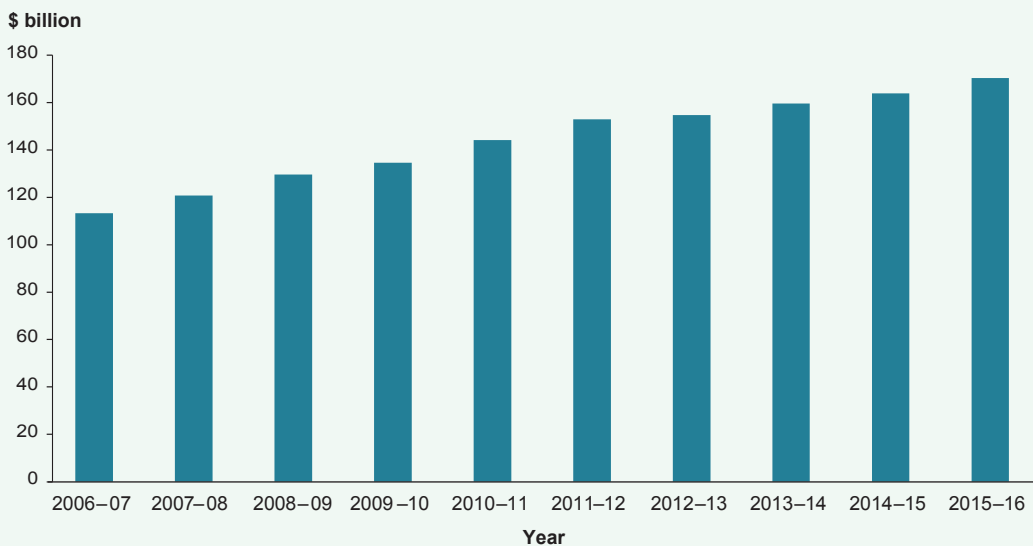
### Trends in health expenditure

Changes in health expenditure occur over time due to a range of factors including increased population, government policy changes, new technologies, changes in patterns of care, as well as increases in the costs of health service delivery.

### Health expenditure was \$170 billion in 2015–16

Total expenditure on health increased each year in real terms (after adjusting for inflation), from \$113 billion in 2006–07 to \$170 billion in 2015–16—an annual average rate of 4.8% (Figure 2.2.1). This growth slowed from 6.2% per annum between 2006–07 and 2011–12, to 3.4% between 2011–12 to 2015–16.

Figure 2.2.1: Total health expenditure, adjusted for inflation, 2006–07 to 2015–16



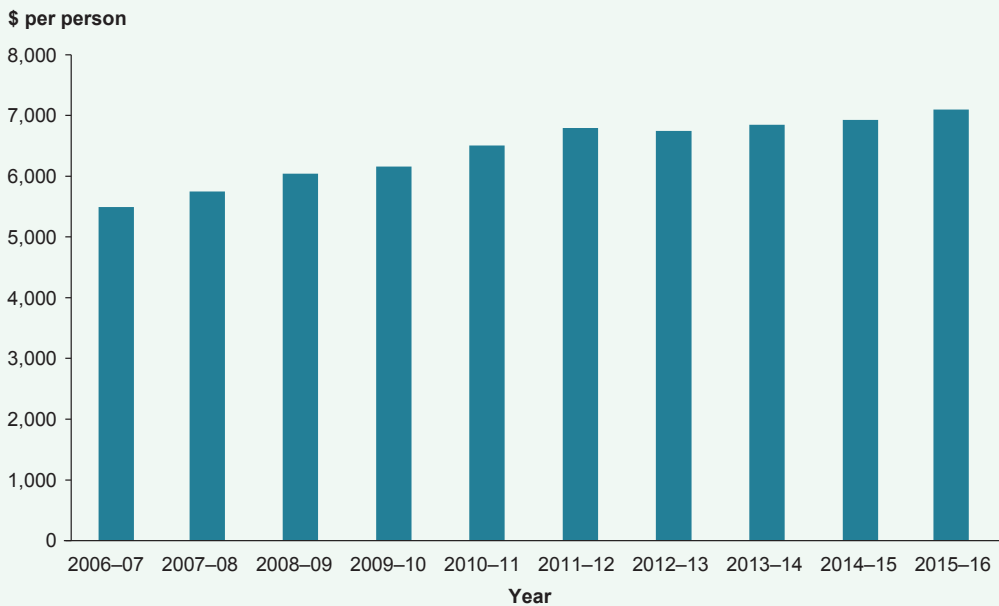
Note: Inflation-adjusted prices expressed in terms of 2015–16 prices.

Source: AIHW health expenditure database; Table S2.2.1.

## Health expenditure grew faster than population growth

Between 2006–07 and 2015–16, growth in total health expenditure was greater than the growth in the population. The population grew by 17% from 20.6 million in 2006–07 to 24.0 million in 2015–16, while total health expenditure (adjusted for inflation) grew by 50% over the same period. Per capita (per person) health expenditure increased 22% (adjusted for inflation) over this period, from \$5,493 to \$7,096—an increase of \$1,603 per person (Figure 2.2.2).

**Figure 2.2.2: Health expenditure per person, adjusted for inflation, 2006–07 to 2015–16**

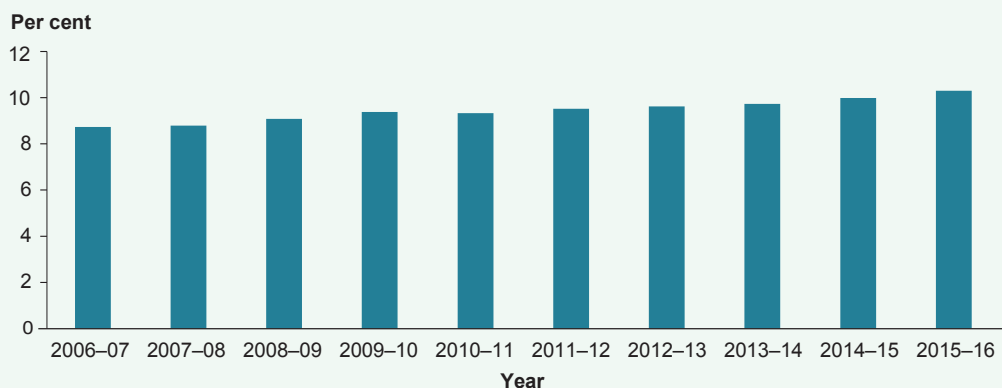


*Note:* Inflation-adjusted prices expressed in terms of 2015–16 prices.

*Source:* AIHW health expenditure database; Table S2.2.2.

## The proportion of GDP spent on health has increased

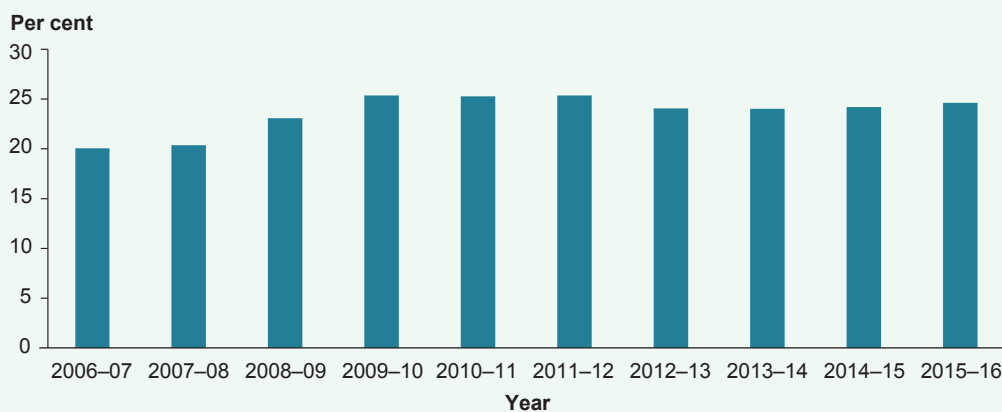
The growth in health expenditure was also greater than the growth in the economy as a whole. Gross domestic product (GDP) had an average annual growth rate of 2.8% between 2006–07 and 2015–16. When expressed as a proportion of GDP, health expenditure grew from 8.7% of GDP in 2006–07 to 10.3% of GDP in 2015–16 (Figure 2.2.3).

**Figure 2.2.3: Ratio of health expenditure to GDP, 2006–07 to 2015–16**

Sources: AIHW health expenditure database; ABS 2017a; Table S2.2.3.

## The proportion of tax revenue spent on health rose then fell

Total government health expenditure was equivalent to about 21% of total tax revenue in 2006–07 and 2007–08. Following the global financial crisis, this share increased to 26% in 2009–10, mainly due to a relative drop in tax revenues. The proportion has since remained around 25–26% (Figure 2.2.4).

**Figure 2.2.4: Government health expenditure, as a percentage of taxation revenue, 2006–07 to 2015–16**

Sources: AIHW health expenditure database; ABS 2017b; Table S2.2.4.

## International comparisons

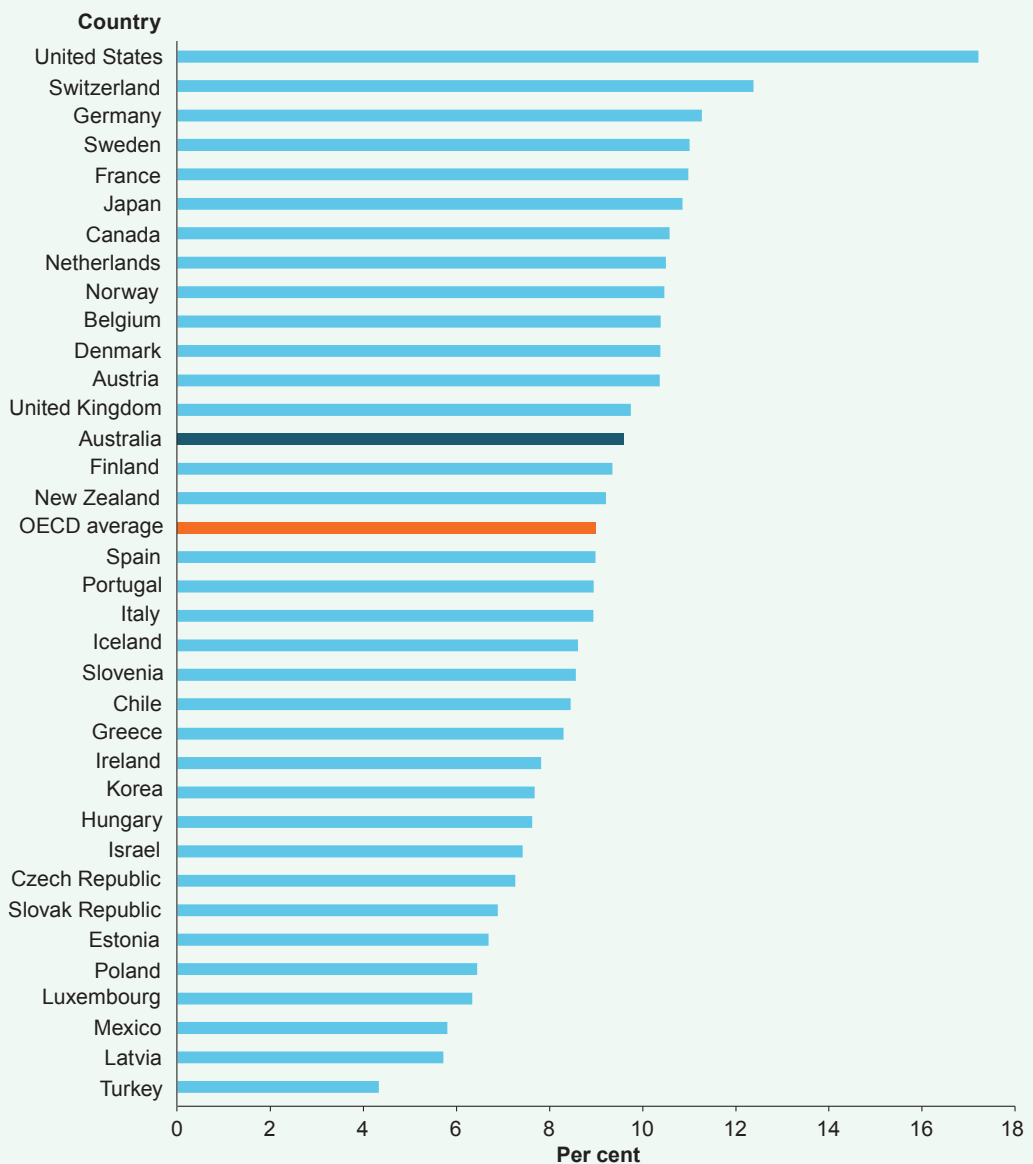
In addition to the National Health Accounts framework the AIHW uses to report expenditure domestically, data is also prepared using the Organisation for Economic Co-operation and Development (OECD) System of Health Accounts. This system is used by OECD member countries to report health expenditure to support international comparisons between member countries.



# Australia's proportion of health expenditure to GDP is higher than the OECD average

Using the OECD System of Health Accounts method (OECD, Eurostat & WHO 2011), the proportion of Australia's health expenditure to GDP was 9.6% in 2016. The average for all OECD countries was 9.0% (Figure 2.2.5). The Australian figure is higher than that for New Zealand (9.2%) and lower than that for the United Kingdom (9.7%) and Canada (10.6%). The United States was by far the highest spender, with the health sector making up 17.2% of its GDP in 2016. The System of Health Accounts data are not comparable with the data presented elsewhere in this article as they do not include the same scope of expenditure.

**Figure 2.2.5: Health expenditure as a proportion of GDP, using the OECD System of Health Accounts, OECD countries and OECD average, 2016**



Source: OECD 2017; Table S2.2.5.

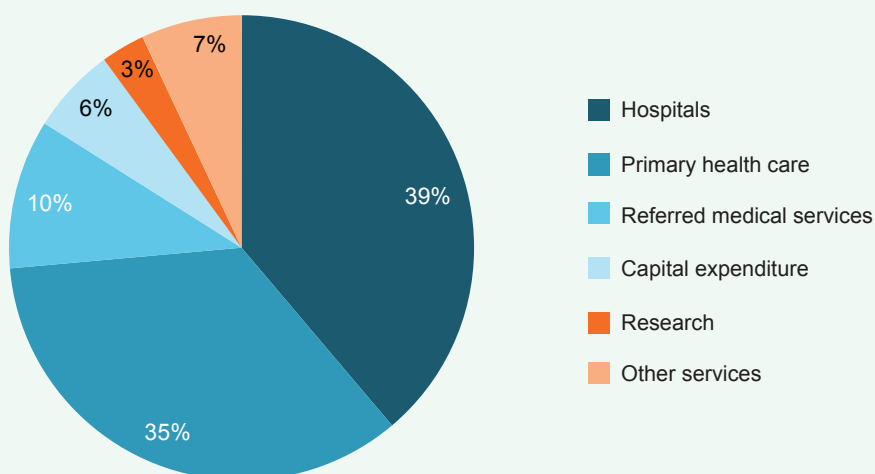
## Where is the money spent?

Health expenditure occurs when money is spent on health goods and services, and investment in equipment and facilities. This excludes expenditure that might have a 'health' outcome, such as education of health practitioners. Recurrent expenditure is the expenditure on goods and services, such as medicines, medical services, hospital services, or public health activities. Capital expenditure is the expenditure on fixed assets such as new buildings.

### Hospitals and primary health care account for three-quarters of total health expenditure

In 2015–16, recurrent health expenditure was \$160 billion, and capital expenditure \$10 billion. The two major areas of expenditure in 2015–16 were hospitals (\$66 billion) and primary health care (\$59 billion)—together they accounted for 74% of total expenditure (Figure 2.2.6).

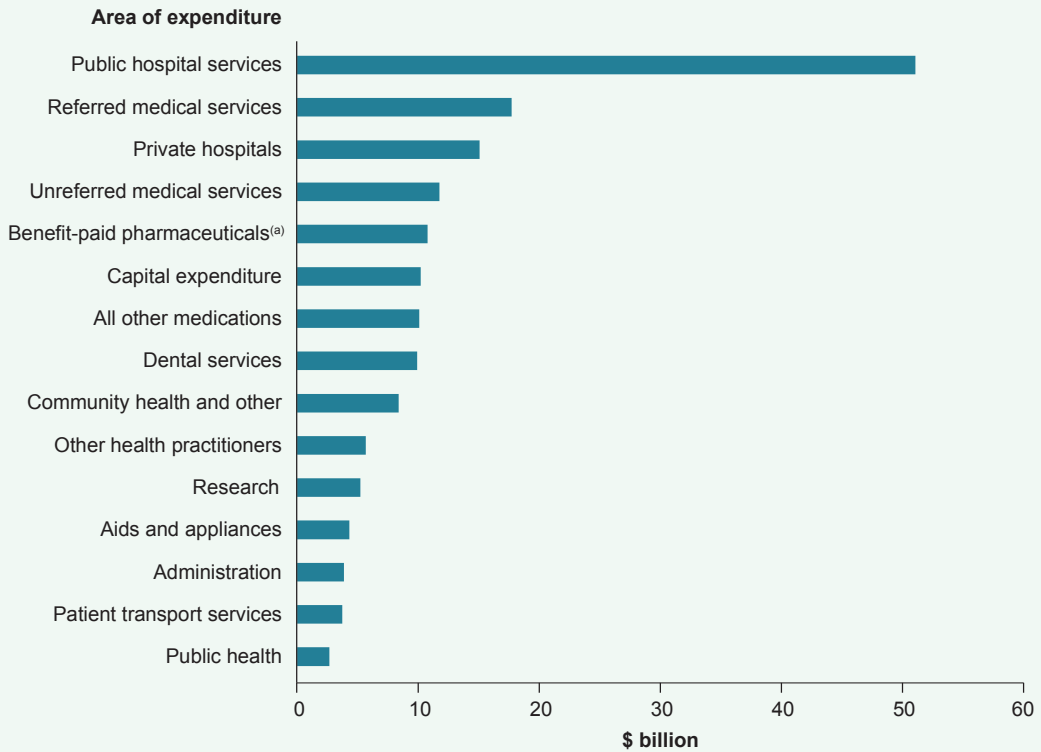
**Figure 2.2.6: Proportion of total health expenditure, by broad area of expenditure, 2015–16**



Sources: AIHW health expenditure database; Table S2.2.6.

Each broad area of expenditure consists of specific components; for example, 'hospitals' consists of public and private hospital services. For these specific components, the largest proportion of expenditure for 2015–16 was for public hospital services (\$51 billion), followed by referred medical services (\$18 billion), and private hospitals (\$15 billion). Expenditure on unreferred medical services was \$12 billion; both community and public health (combined), and benefit-paid pharmaceuticals had expenditures of \$11 billion; the expenditure (for each component) on all other medications, dental services, and capital expenditure was \$10 billion; it was \$6 billion on other health practitioners; and \$4 billion (for each component) on aids and appliances, and on patient transport services (Figure 2.2.7).

Figure 2.2.7: Total health expenditure, by area of expenditure, 2015–16



(a) Benefit-paid pharmaceuticals are pharmaceuticals accessed through the Pharmaceutical Benefits Scheme and Repatriation Pharmaceutical Benefits Scheme.

Source: AIHW health expenditure database; Table S2.2.7.

## Who pays for what?

Healthcare in Australia is funded by the Australian Government, state and territory governments, and non-government entities such as individuals, private health insurers, third-party insurers and workers compensation. These sources of funds pay for health care across the health system through various funding arrangements.

### Governments funded two-thirds of health expenditure

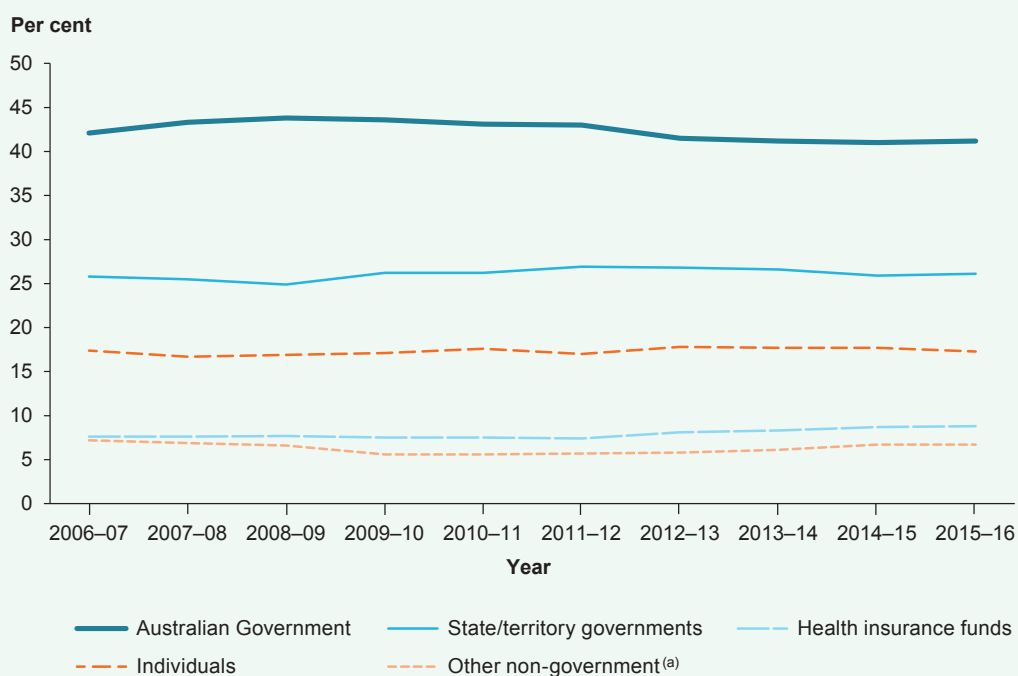
In 2015–16, governments funded \$115 billion of the total health expenditure (67%) with non-government sources funding the remaining \$56 billion (33%).

Of the \$115 billion government contribution in 2015–16, the Australian Government contributed \$70 billion (61%), with state and territory governments contributing \$44 billion (39%).

In 2015–16, funding by individuals was \$29 billion. This was 53% of the \$56 billion in non-government funding, or 17% of total health expenditure.

Figure 2.2.8 shows the proportion of total expenditure from each source of funds from 2006–07 to 2015–16. The proportion contributed by the Australian Government was between 42% and 44% from 2006–07 to 2008–09, and remained steady at 41% from 2012–13, following the introduction of means testing of the private health insurance rebate in April 2012. The proportion of expenditure from private health insurance funds was steady at around 7% between 2006–07 and 2011–12, increasing to 9% in 2015–16. State and territory expenditure was between 25% and 26% from 2006–07 to 2010–11, and 26% to 27% from 2011–12 to 2015–16. Expenditure by individuals was steady over the decade, at around 17%. Other non-government expenditure fluctuated between 6% and 7% over the decade.

**Figure 2.2.8: Proportion of health expenditure, by source of funds, 2006–07 to 2015–16**



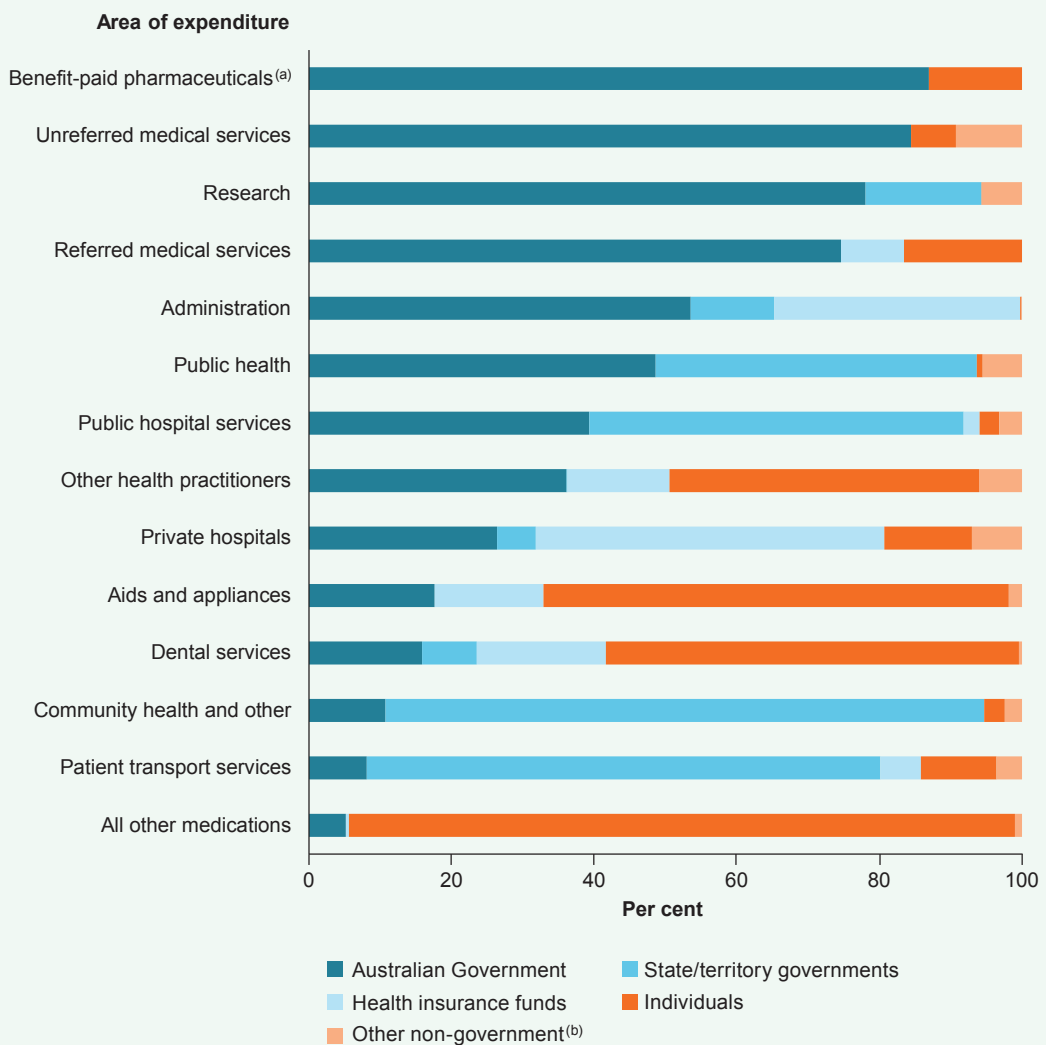
(a) 'Other non-government' includes workers' compensation and third-party insurance.

Source: AIHW health expenditure database; Table S2.2.8.

# Source of funds varies for areas of expenditure

The funding of different areas of expenditure within the health system is not evenly distributed between the various sources of funding (Figure 2.2.9). The majority of expenditure on benefit-paid pharmaceuticals is from the Australian Government. State and territory government expenditure is the largest component of community and public health expenditure, while individuals paid for the majority of all other medications.

**Figure 2.2.9: Proportion of health expenditure, by source of funds and area of expenditure, 2015–16**



(a) Benefit-paid pharmaceuticals are pharmaceuticals accessed through the Pharmaceutical Benefits Scheme and Repatriation Pharmaceutical Benefits Scheme.

(b) 'Other non-government' include workers' compensation and third-party insurance.

Source: AIHW health expenditure database; Table S2.2.9.

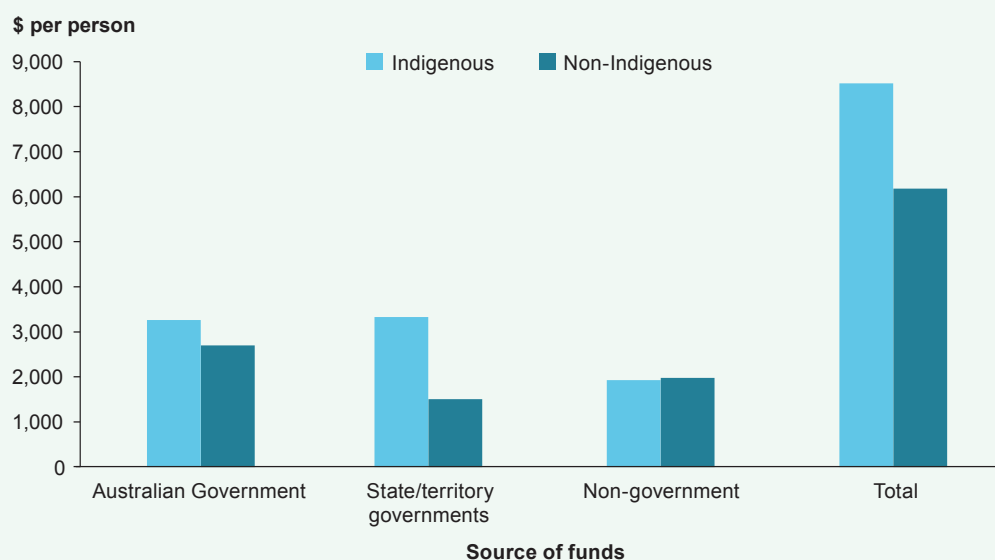
# Indigenous health expenditure

## Indigenous health expenditure per person is more than for non-Indigenous Australians

The total health expenditure for Aboriginal and Torres Strait Islander Australians differs from that for non-Indigenous Australians. The estimated health expenditure in 2013–14 for Indigenous Australians was \$8,515 per person compared with \$6,180 for non-Indigenous Australians—38% as high. This is not inconsistent with the higher health needs of Indigenous Australians and the higher cost of delivering services in rural and remote areas, where a greater proportion of Indigenous Australians live compared with non-Indigenous Australians (AIHW 2017a, 2017b; SCRGSP 2017). Of the total health expenditure per person for Indigenous and non-Indigenous Australians, in 2013–14:

- the Australian Government provided 38% (\$3,261) of the health expenditure for Indigenous and 44% (\$2,698) for non-Indigenous Australians
- state and territory governments provided 39% (\$3,329) of the health expenditure for Indigenous and 24% (\$1,508) for non-Indigenous Australians
- non-government sources provided 23% (\$1,926) of the health expenditure for Indigenous and 32% (\$1,974) for non-Indigenous Australians (Figure 2.2.10).

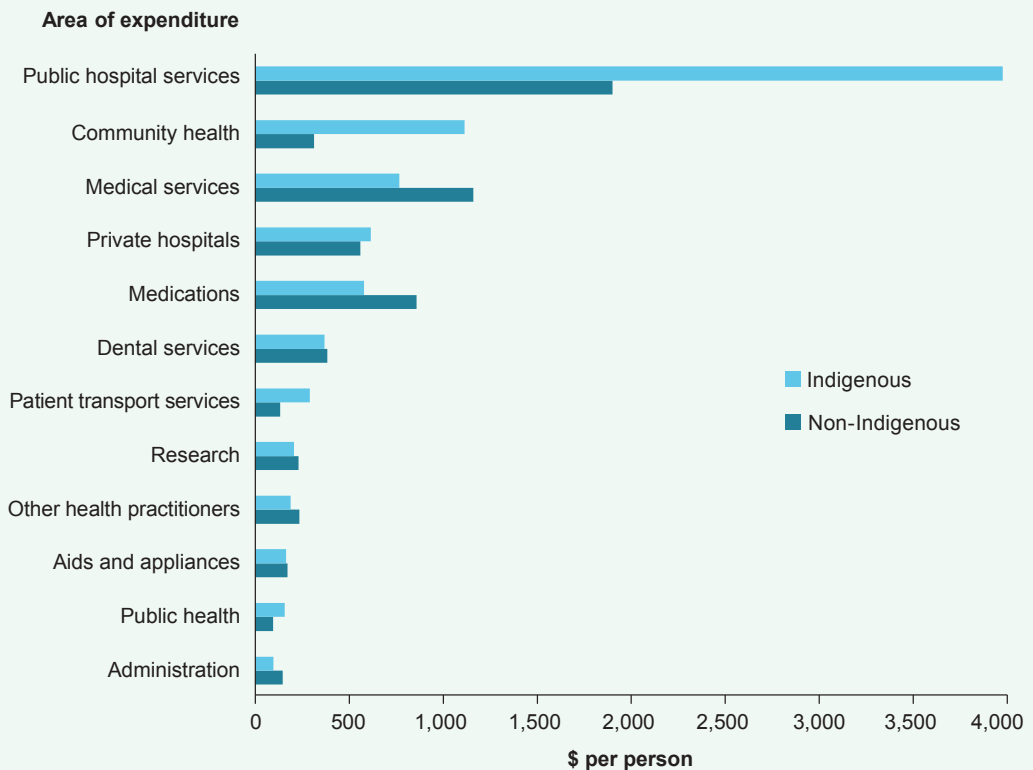
**Figure 2.2.10: Health expenditure per person, by Indigenous status and source of funds, 2013–14**



Source: AIHW 2017a; Table S2.2.10.

The distribution of health expenditure across the areas of expenditure for Indigenous Australians differed from that for non-Indigenous Australians. Figure 2.2.11 shows that more is spent per person on hospital and community health services for Indigenous Australians than for non-Indigenous Australians, and less is spent on medications and medical services for Indigenous Australians than for non-Indigenous Australians.

**Figure 2.2.11: Health expenditure per person, by Indigenous status and area of expenditure, 2013–14**



Source: AIHW 2017a; Table S2.2.11.

## What is the AIHW doing?

The AIHW is undertaking work in the following areas:

- Improving the compatibility of domestic and international expenditure reporting. The System of Health Accounts framework has been updated to include items not currently disaggregated in the current AIHW methodology. Work is continuing to update reporting to these new methods.
- Considering new and alternative sources of health expenditure information. The AIHW reviews the data sources available and methods employed to estimate health expenditure when necessary. This ensures that the estimates it produces are of a high quality. New sources of health expenditure data are being investigated for items such as out-of-pocket expenditure, private prescriptions, and hospital services.

- Expanding and improving estimations for disease expenditure by developing a formal method for future use. This will enable detailed analysis of the reasons for expenditure in certain areas of the health system.

## What is missing from the picture?

The health expenditure data collection does not include information from some funding sources. Health-related costs from the Australian Defence Force or from correctional and detention facilities are not collected for inclusion in the AIHW health expenditure database. Data for programs that are self-funded by local governments (such as public health initiatives funded and run by local authorities or councils) are not included in the health expenditure database collection. Funding for health care received by local government authorities from a state or territory government is included in that jurisdiction's expenditure. Not all expenditure by non-government organisations is included, such as initiatives run from private donations to the organisations. Some payments from the Australian Government are counted as expenditure in the financial year the payment occurred even if it related to services provided and expenditure incurred by service providers in earlier years.

## Where do I go for more information?

More information on Australian health expenditure and methods is available at <[www.aihw.gov.au/reports-statistics/health-welfare-overview/health-welfare-expenditure/overview](http://www.aihw.gov.au/reports-statistics/health-welfare-overview/health-welfare-expenditure-overview)>. The report *Health expenditure Australia 2015–16* and other recent publications are available for free download. Information on international comparisons for each country is available at <[data.oecd.org/healthres/health-spending.htm](http://data.oecd.org/healthres/health-spending.htm)>.

## References

- ABS (Australian Bureau of Statistics) 2017a. Australian national accounts: national income, expenditure and product, March 2017. ABS cat. no. 5206.0. Canberra: ABS.
- ABS 2017b. Taxation revenue, Australia, 2015–16. ABS cat. no. 5506.0. Canberra: ABS.
- AIHW (Australian Institute of Health and Welfare) 2017a. Aboriginal and Torres Strait Islander Health Performance Framework 2017: supplementary online tables. Cat. no. WEB 170. Canberra: AIHW.
- AIHW 2017b. Australian health expenditure—demographics and diseases: hospital admitted patient expenditure 2004–05 to 2012–13. Health and welfare expenditure series no. 59. Cat. no. HWE 69. Canberra: AIHW.
- OECD (Organisation for Economic Co-operation and Development) 2017. Health Statistics 2017. WHO Global Health Expenditure Database. Paris: OECD.
- OECD, Eurostat & WHO (World Health Organization) 2011. A system of health accounts. OECD Publishing. Paris: OECD.
- SCRGSP (Steering Committee for the Review of Government Service Provision) 2017. 2017 Indigenous expenditure report. Canberra: Productivity Commission.



## 2.3 Who is in the health workforce?

The health workforce in Australia is large and diverse, covering many occupations. These include health practitioners registered by the Australian Health Practitioner Regulation Agency (AHPRA) (Box 2.3.1) as well as other health professionals and health support workers.

### Registered health practitioners

#### Box 2.3.1: Australian Health Practitioner Regulation Agency and the National Registration and Accreditation Scheme

The AHPRA regulates Australia's health practitioners in partnership with the National Registration Boards. The current list of registered health professions are Aboriginal and Torres Strait Islander Health Practice, Chinese Medicine, Chiropractic, Dental, Medical, Medical Radiation Practice, Nursing and Midwifery, Occupational Therapy, Optometry, Osteopathy, Pharmacy, Physiotherapy, Podiatry and Psychology. The AHPRA intends to start registering Paramedics by the end of 2018 (AHPRA 2017).

See Chapter 2.1 'How does Australia's health system work?' for more information on health workforce registration.

Source: AHPRA 2017.

The National Health Workforce Dataset shows that nurses and midwives are the largest group in the registered health workforce—with almost 370,000 registered and more than 315,000 employed in 2016 (Table 2.3.1).

**Table 2.3.1: Key workforce statistics and full-time equivalent (FTE) rates for selected health professions**

	Nurses and midwives	Medical practitioners	Psychologists	Physiotherapists	Dentists
<b>Registered</b>	369,790 in 2016 ↑ 7.4% from 344,190 in 2013	101,070 in 2016 ↑ 10.5% from 91,472 in 2013	29,163 in 2016 ↑ 9.1% from 26,725 in 2013	29,591 in 2016 ↑ 15.8% from 25,545 in 2013	16,549 in 2016 ↑ 6.9% from 15,479 in 2013
<b>Employed</b>	315,137 in 2016 ↑ 6.8% from 295,177 in 2013	91,341 in 2016 ↑ 10.8% from 82,408 in 2013	25,213 in 2016 ↑ 9.2% from 23,089 in 2013	24,255 in 2016 ↑ 15.2% from 21,052 in 2013	14,634 in 2016 ↑ 8.4% from 14,634 in 2013
<b>FTE per 100,000 people</b>	1,145 in 2016 ↓ 0.9% from 1,155 in 2013	400 in 2016 ↑ 4.7% from 382 in 2013	89 in 2016 ↑ 3.5% from 86 in 2013	92 in 2016 ↑ 10.8% from 83 in 2013	58 in 2016 ↑ 3.6% from 56 in 2013
<b>Percentage that are women</b>	89% in 2016 about the same as in 2013—90%	41% in 2016 ↑ from 39% in 2013	79% in 2016 ↑ from 77% in 2013	66% in 2016 ↓ from 68% in 2013	41% in 2016 ↑ from 38% in 2013

Source: Department of Health National Health Workforce Dataset 2013 and 2016.

In FTE terms, there were 1,145 FTE nurses and midwives, and 400 FTE medical practitioners for every 100,000 people in 2016. The number of FTEs for other professions was much lower, with 89 psychologists, 92 physiotherapists and 58 dentists for every 100,000 people.

In 2015, Australia had more doctors (3.5) and registered nurses (11.5) per 1,000 people than Canada (2.7 and 9.9, respectively), the United Kingdom (2.8 and 7.9) and New Zealand (3.0 and 10.3) (OECD 2017a, 2017b).

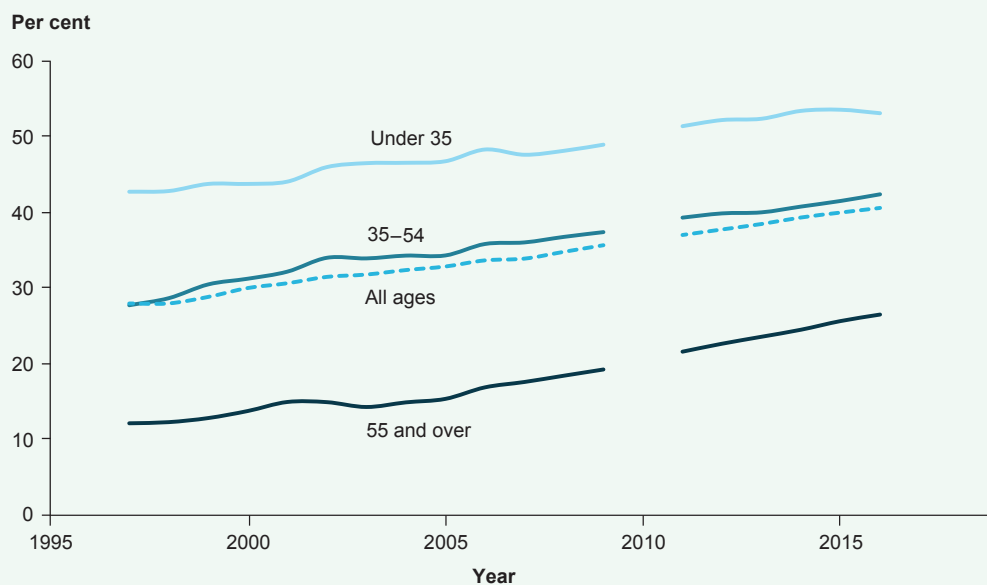
## The age profile of nurses and midwives is changing

The age group profile of nurses and midwives is changing: the size of the middle age group is decreasing while younger and older age groups are growing. From 2013 to 2016, the number of employed nurses and midwives aged 20–34 increased by 15,500, or 19%. The size of the group aged 35–54 fell by 3,500 or 2.1%, and the group aged 55 and over grew by 11,000, or 15%.

## More women are becoming medical practitioners

A larger proportion of medical practitioners entering the workforce are women. In 1997, 43% of employed medical practitioners under the age of 35 were women. This has grown to around 53% since 2014 (Figure 2.3.1). In 2016, 31% of employed medical specialists were women, up from 16% in 1997.

**Figure 2.3.1: Proportion of employed medical practitioners who are women, by age, 1997–2016**



Sources: AIHW Medical Labour Force Survey: 1997 to 2009; AIHW National Health Workforce Dataset: 2011 and 2012; Department of Health National Health Workforce Dataset: 2013 to 2016.

Even though the trend is towards more women in the health workforce, medical practitioners (and dentists) still have a relatively low proportion of women compared with other health practitioners. In 2016, women represented 41% of medical practitioners (and dentists) (Table 2.3.1).

## Australia has many overseas-trained registered health professionals

Migrant/overseas-trained health workers form a substantial part of the health workforce in Australia. For example, in 2016, 33% of medical practitioners employed in Australia received their initial qualification overseas. They make up 31% of employed medical practitioners in *Major cities* and 41% of employed medical practitioners in rural and remote areas of Australia.

## Health workers and professions not registered

Many people employed in the health sector work in occupations that are not registered by the AHPRA, but they play an important role in delivering health services. These occupations include clerical workers, health information managers, welfare professionals, service workers, cleaners and gardeners.

In the Australian Bureau of Statistics (ABS) 2016 Census of Population and Housing (the Census), more than 800,000 people reported working in the health services industry. Between 2011 and 2016, the number of people employed in health services grew from 674,000 to 801,000 (ABS 2017).

Among the health industry occupations (other than AHPRA registered professions) identified in the 2016 Census, the largest groups were 69,000 receptionists, 25,000 nursing support and personal care workers, 21,000 medical technicians, 21,000 dental assistants, 17,000 general clerks and 13,000 ambulance officers and paramedics. There were also 9,000 kitchen hands and 10,000 commercial cleaners, most of whom worked in hospitals.

## What is missing from the picture?

The AHPRA does not register all health professionals. There is thus little information on those professions not required to register. This includes, for example, dietitians, speech therapists, sonographers, audiologists and social workers.

## Where do I go for more information?

More information on registered health professions is available at the AHPRA at <[www.ahpra.gov.au](http://www.ahpra.gov.au)> and workforce data are available via the Department of Health website at <[hwd.health.gov.au](http://hwd.health.gov.au)>.

Workforce data are sourced from the National Health Workforce Dataset—Australian Government Department of Health. The workforce data used in this publication were provided by the AHPRA.

## References

ABS (Australian Bureau of Statistics) 2017. ABS Census table builder. Canberra: ABS. Viewed 19 January 2018, <<https://auth.censusdata.abs.gov.au/webapi/jsf/dataCatalogueExplorer.xhtml>>.

AHPRA (Australian Health Practitioner Regulation Agency) 2017. Australian Health Practitioner Regulation Agency annual report 2016/17. Melbourne: AHPRA.

OECD (Organisation for Economic Co-operation and Development) 2017a. Health at a glance 2017: OECD indicators. Paris: OECD Publishing.

OECD 2017b. OECD.Stat 2017. Paris: OECD. Viewed 17 January, 2018, <[http://stats.oecd.org/viewhtml.aspx?datasetcode=HEALTH\\_REAC&lang=en#](http://stats.oecd.org/viewhtml.aspx?datasetcode=HEALTH_REAC&lang=en#)>.

## Acknowledgements

Workforce data are sourced from the National Health Workforce Dataset—Australian Government Department of Health.

The workforce data used in this publication were provided by the Australian Health Practitioner Regulation Agency.

## 2.4 Digital health

Digital health is about using technology to collect and share a person's health information. It can be as simple as a person wearing a device to record how much exercise they do each day, to health care providers sharing clinical notes about an individual.

For individuals, this technology can help people to track and control their own health information and inform decisions about their health. For health care providers, it can support continuity of care; improve interactions between providers and patients; and improve the effectiveness, efficiency and delivery of services.

This snapshot explains how digital health is being used in Australia, with a focus on the Australian Government's digital health strategy and online health information initiative—My Health Record.

### How digitally connected are we?

Health information can be recorded and shared on a variety of digital devices and platforms, including general practitioner, hospital and pathology systems; smartphones, tablets, desktop computers, smartwatches, and social networks. The clear majority of Australians have access to digital technology. It is estimated that:

- 86% of households had internet access at home in 2016–17 (ABS 2018)
- 88% of people aged 18–75 owned or had access to a smartphone in 2017 (Drumm et al. 2017)
- 78% of adults used the internet to find health-related information in 2015 (Research Australia 2017)
- 96% of general practitioners used computers for clinical purposes in 2014–15 (Britt et al. 2015)
- 23% of Australians had a My Health Record in March 2018. By the end of 2018, all Australians will have a My Health Record unless they opt out (ADHA 2017b, 2018).

### Digital health in practice

The scope and use of digital health technologies are growing and changing rapidly. This is enabling real-time information to be available to both patients and their health care providers.

The following initiatives are examples of the growth and benefits of digital health:

- There is growing use of digital systems by Australian health care providers, including general practices, community pharmacies and public and private hospitals.
- Electronic health records are associated with improved quality and safety of care in enhancing clinical decision support and improving handover of care between health care providers (National E-Health Transition Authority 2015).
- Cardiac rehabilitation programs (CRPs) are crucial for improving the health of patients recovering from a heart attack. An Australian CRP delivered through a smartphone resulted in higher attendance (80% compared with 62%) and higher levels of completion (80% compared with 47%) than a face-to-face, centre-based CRP (Varnfield et al. 2014).

- Medication-prescribing errors are a serious patient safety issue and costly to public health budgets. An international review found that a change from paper-based ordering to electronic ordering in intensive care units resulted in an 85% reduction in error rates for prescription of medications (Prgomet et al. 2016).

## Australia's Digital Health Strategy

In August 2017, all Commonwealth, state and territory health ministers agreed to the following seven strategic priorities for digital health in Australia:

- health information is available whenever and wherever it is needed through the My Health Record
- every health care provider can communicate with their patients and other health care providers through secure digital technologies
- high-quality data with a commonly understood meaning can be used with confidence
- all prescribers and pharmacists have access to electronic prescribing and dispensing by 2022
- maximum use is made of digital technology to improve accessibility, quality, safety, and efficiency of care
- all health care professionals can confidently and efficiently use digital health technologies
- the digital health industry thrives and delivers world-class innovation (ADHA 2017a).

My Health Record is an online platform for storing a person's health information, including their Medicare claims history, hospital discharge information, diagnostic imaging reports, and details of allergies and medications (ADHA 2017b). The person and their authorised health care provider(s), can access these details securely at any time (Box 2.4.1).

### Box 2.4.1: Case study

Paige was diagnosed with epilepsy as a teenager and lost her hearing after her first child was born. This is her story:

At one point during my pregnancy I had to keep track of more than 12 obstetric outpatient hospital visits, 3 neurology appointments, various pathology tests as well as GP visits. To add to this, my husband and I have five children...It became increasingly difficult to keep track of everything. My Health Record helps me keep a single record of my own health information, and the whole family has an individual My Health Record...Personally, it means my medical history is easily accessible to manage my health...As a parent, it empowers me to take control and gain visibility of my family's health care and make the most informed decisions (ADHA 2017a).

In early 2018, around 23% of Australians had a My Health Record. By the end of 2018, all Australians will be registered unless they choose to opt out (ADHA 2017b, 2018). Given this, the Australian Government has built substantial privacy and security safeguards into the legislation establishing the My Health Record (ADHA 2016). A 2017 consumer-perspective review of My Health Record found that although there are some

concerns about privacy and security, there is sufficient trust in the government to put systems in place to ensure this (Van Kasteren et al. 2017). See Chapter 2.5 'Secondary use of health information' for more information on the legal instruments that regulate sensitive data.

## What is missing from the picture?

There are no national data available to allow detailed understanding of the use and outcomes from the vast range of digital health applications.

## Where do I go for more information?

Detailed information on Australia's National Digital Health Strategy is available at <[www.digitalhealth.gov.au/about-the-agency/publications/australias-national-digital-health-strategy](http://www.digitalhealth.gov.au/about-the-agency/publications/australias-national-digital-health-strategy)>.

Information about My Health Record for individuals and health care providers is available at <[www.myhealthrecord.gov.au](http://www.myhealthrecord.gov.au)>.

## References

- ABS (Australian Bureau of Statistics) 2018. Household use of information technology, Australia, 2016–17. ABS cat. no. 8146.0. Canberra. ABS.
- ADHA (Australian Digital Health Agency) 2016. Legislation and governance. Sydney: ADHA. Viewed 11 December 2017, <<https://myhealthrecord.gov.au/internet/mhr/publishing.nsf/Content/legislation>>.
- ADHA 2017a. Annual report 2016–17. Sydney: ADHA. Viewed 3 November 2017, <[https://www.digitalhealth.gov.au/about-the-agency/publications/reports/annual-report/Annual\\_Report\\_Australian\\_Digital\\_Health\\_Agency\\_2016-2017\\_Online.pdf](https://www.digitalhealth.gov.au/about-the-agency/publications/reports/annual-report/Annual_Report_Australian_Digital_Health_Agency_2016-2017_Online.pdf)>.
- ADHA 2017b. Australia's National Digital Health Strategy: safe, seamless and secure. Sydney: ADHA. Viewed 3 November 2017, <[https://www.digitalhealth.gov.au/about-the-agency/publications/australias-national-digital-health-strategy/ADHA-strategy-doc-\(2ndAug\).pdf](https://www.digitalhealth.gov.au/about-the-agency/publications/australias-national-digital-health-strategy/ADHA-strategy-doc-(2ndAug).pdf)>.
- ADHA 2018. My Health Record statistics. Sydney: ADHA. Viewed 23 March 2018 <<https://myhealthrecord.gov.au/internet/mhr/publishing.nsf/Content/news-002>>.
- Britt H, Miller GC, Henderson J, Bayram C, Harrison C & Valenti L et al. 2015. General practice activity in Australia 2014–15. General practice series no. 38. Sydney: Sydney University Press.
- Drumm J, White N, Morne S & Davey M 2017. Smart everything, everywhere: mobile consumer survey 2017—the Australian cut. Sydney: Deloitte. Viewed 4 December 2017, <[http://landing.deloitte.com.au/rs/761-IBL-328/images/tmt-mobile-consumer-survey-2017\\_pdf.pdf?utm\\_source=marketo&utm\\_medium=lp&utm\\_campaign=tmt-mobile-consumer-survey-2017&utm\\_content=body](http://landing.deloitte.com.au/rs/761-IBL-328/images/tmt-mobile-consumer-survey-2017_pdf.pdf?utm_source=marketo&utm_medium=lp&utm_campaign=tmt-mobile-consumer-survey-2017&utm_content=body)>.
- National E-Health Transition Authority 2015. My eHealth record to national eHealth record transition impact evaluation: phase 1 evaluation report. Sydney: National E-Health Transition Authority Ltd.
- Prgomet M, Li L, Niazkhani Z, Georgiou A & Westbrook J 2016. Impact of commercial computerized provider order entry (CPOE) and clinical decision support systems (CDSSs) on medication errors, length of stay, and mortality in intensive care units: a systematic review and meta-analysis. *Journal of the American Medical Informatics Association* 24(2):413–22. doi:org/10.1093/jamia/ocw145.
- Research Australia 2017. Australia speaks! Research Australia opinion polling 2017. Sydney: Research Australia. Viewed 4 December 2017, <<https://researchaustralia.org/wp-content/uploads/2017/08/2017-Opinion-Poll-Digital.pdf>>.
- Van Kasteren Y, Maeder A, Williams P & Damarell R 2017. Consumer perspectives on MyHealth Record: a review. In: Ryan A, Schaper L & Whetton S (eds). *Integrating and connecting care: selected papers from the 25th Australian National Health Informatics Conference*. Amsterdam: IOS Press 239:146–152. doi: 10.3233/978-1-61499-783-2-146.
- Varnfield M, Karunanithi M, Lee C-K, Honeyman E, Arnold D, Ding H et al. 2014. Smartphone-based home care model improved use of cardiac rehabilitation in postmyocardial infarction patients: results from a randomised controlled trial. *Heart* 100(22):1770–9. doi:10.1136/heartjnl-2014-305783.

## 2.5 Secondary use of health information

Every day, the clear majority of Australians log on to some form of digital technology, such as a smartphone or a tablet. In 2014–15, 86% of Australian households—including 97% of those with children under 15—had internet access (ABS 2016). This ‘doorway’ to the digital world has brought with it unprecedented access to vast volumes of data—including data on our health and welfare.

Health data relate to information gathered on people’s health (and factors that affect it) and the health system. These data can be collected from a diverse range of sources, including the health care system itself, health practitioners, medical research, or individuals tracking their own health. For example, wearable trackers have been used to track and increase physical activity (Kaiser et al. 2016) and social media data have been used to provide early insight into disease outbreaks (Brown 2015).

The amount of health data generated is increasing rapidly. One report estimated that the global amount of health data being generated grew by 48% every year, and that the amount of health data is expected to exceed 2,000 exabytes (2 billion terabytes) by the year 2020 (EMC 2014).

The growth in digital technology and ‘digital health’—the term used when this technology is used to collect and share a person’s health information (see Chapter 2.4 ‘Digital health’)—has increased the volume of data available for health research. This, in turn, has increased opportunities for ‘secondary use’ of health data to improve the health system and the wellbeing of Australians.

### What is meant by secondary use?

‘Secondary use’ of data refers to any application of data beyond the reason for which they were first collected (known as the primary use or purpose). For example, the primary use of data collected to treat a patient in a hospital is to provide the patient with the care they need in that hospital episode; a secondary use could be to aggregate patients’ data to compare hospital performance across Australia.

Secondary use of data presents an enormous opportunity to improve the health treatment that Australians receive. Health data can be used in this way to monitor and improve hospital performance—this can include improving flagging facilities (where this can be done) and identifying top-performing hospitals. Processes and practices of top-performing health facilities can then be adopted by others, thereby improving quality of care overall.

However, use of an individual’s health data to enable these improvements must be balanced against the risk to their privacy. Australia has many legal requirements and systems in place to ensure that privacy is protected.



This article focuses on two aspects of secondary use of health data: the insights that can be gained from secondary use of administrative data, and how data integration can be used to gain a deeper and broader view of the health system and the many factors that affect a person's health outcomes. Aspects of privacy protection with the processes that support these uses are also discussed.

## Insights from administrative data

Health care in Australia is delivered by a variety of professionals in many different settings—from state-of-the-art operating rooms to care provided in a patient's home. Administrative data can be considered as data collected from running these services and programs. In the case of health, these cover data from hospitals, health professionals, pharmacies and allied health care.

Using these data for secondary purposes can help to glean a holistic overview of the health system and the pathways that individuals take when using health services. For example, access to the data allows a variety of analyses to be undertaken, including examining trends in health expenditure, examining patient outcomes from particular treatments, looking at potential risk factors and determinants of health and disease, and tracking hospital wait times. Another application of secondary use is identifying, and then inviting, patients for clinical trials and studies.

Using this vast amount of data has the potential for improvements in the quality and safety of health care—and in clinical and administrative processes—as well as for better targeting of resources. Ultimately, the potential is there for a healthier population.

Many of the chapters in this report show the wide application and benefits of secondary use of data for research purposes.

## Data linkage

The value of administrative data increases when individual data sets are linked to provide a more robust picture of the people using the services and the system. Data linkage and data integration combine information from two or more data sets to create a new, more detailed data set that can tell a much more meaningful story than would be possible from a single data source. This may involve bringing together data from the same source over different time periods to see the effect of events that have occurred across a person's life, or bringing together two different data sets to get a broader understanding of factors that can affect a person's health. For example, researchers at the University of New South Wales are examining the factors that lead to poor outcomes following prescription opioid use by linking Medicare, pharmaceutical, mortality and cancer data sets (AIHW 2017a). Bringing these data together will provide researchers with a much more comprehensive view than if they were to examine each data source individually.

Today's unprecedented volume, diversity and speed of data generation present many new opportunities for data linkage. As more health data become available, academics, researchers and organisations such as the AIHW are looking at how data linkage can provide insights into the health of Australians and the performance of the health system.

Box 2.5.1 provides two examples of data linkage projects which have enabled better responses to health problems.

The AIHW is one of a small number of accredited integrating authorities in Australia—the others include the Australian Bureau of Statistics and the Australian Institute of Family Studies (NSS 2014). These organisations can undertake high-risk data integration projects using Commonwealth data as they have strict privacy and confidentiality controls in place. There are also state-based data linkage units that link state and territory data for research purposes. These units, along with the AIHW, are members of the Population Health Research Network, a collaboration to build data linkage infrastructure at the national level (Productivity Commission 2017).

#### **Box 2.5.1: Data linkage—two case studies**

In 2017, the AIHW first published a report providing new insight into suicide among contemporary Australian Defence Force (ADF) personnel (with at least 1 day of service since 1 January 2001). The study constructed a data set by linking ADF personnel administrative data and the National Death Index. This linked data set was then supplemented by information on confirmed suicide deaths from the Defence Suicide Database and cause of death information from the National Mortality Database. This linkage allowed the AIHW to identify characteristics of the contemporary ex-serving population associated with suicide risk (see Chapter 5.6 'Veterans'). Following from this, the AIHW and the Department of Veterans' Affairs have now begun a 3-year partnership to monitor veteran suicide rates and develop a comprehensive profile of the health and welfare of Australian veterans and their families to understand their current situation and future needs (AIHW 2017b).

Researchers from the University of South Australia, the University of Adelaide and the Flinders Centre for Innovation used data linkage to uncover important insights into colorectal cancer treatment patterns. The researchers linked data from the South Australia Cancer Registry to hospital and radiotherapy data. The Population Health Research Network carried out the linkage, ensuring that the researchers themselves did not access any information that could identify individuals. The study found that recommended treatments were less likely to be performed on people who were older, who lived in rural areas or who had severe or multiple diseases. This information promises to improve outcomes by highlighting a segment of the population that can be targeted to ensure that they receive the recommended treatment for colorectal cancer (Beckmann et al. 2014).

Programs such as the Data Integration Partnership for Australia are developing ways to efficiently derive the most societal benefit from new linkage opportunities, while maintaining the consideration and protection given to privacy. The program brings together agencies from across the Australian Government to work together on data integration projects that will better indicate how factors that influence health and welfare affect outcomes for Australians.

## Taking a person-centred approach to data

The increasing availability of digital data comes with a community expectation that public data will be used to improve outcomes for Australian people. There is now growing interest in person-centred data—a model that focuses on the individual and recognises that the various aspects of a person’s life interact, and are influenced by, their own specific circumstances. For example, a person’s health outcomes are affected by multiple influences, including their genetic make-up; where they live; their housing and employment; how much they earn; and a multitude of other biological, lifestyle, socioeconomic, societal and environmental factors.

## Privacy, security and current protections

Governments, organisations and individuals now have unprecedented access to a growing volume of digital data. The ever-increasing delivery of faster, high-quality, useable information comes with the obligation that public data are held securely, and that individual privacy is protected. The Productivity Commission’s *Inquiry on data availability and use* suggests that, on the whole, people are willing to make their information available, but this willingness is conditional. The public needs to trust how data are handled; they also need to feel that they have some control over how they will be used and who will use them, and to see (and ideally directly benefit from) the potential value of this use (Productivity Commission 2017).

A 2017 survey showed that 93% of Australians support using medical records for research. As well, more than 95% of survey respondents had moderate, high or very high trust that researchers would use health data responsibly (Research Australia 2017).

Australia has many legislative arrangements to protect individual privacy. These protections ensure that the privacy of individuals is respected, while ensuring that data are available to use for public benefit, particularly in health research. The *Privacy Act 1988* (Cwlth) recognises that it is often impractical or impossible for researchers to obtain people’s consent for the use of their data in specific research projects. As such, a set of guidelines produced by the Privacy Commissioner must be followed by any researcher approved to use health data without patient consent. These guidelines also assist human research ethics committees in deciding whether research projects should be approved (OAIC n.d.).

Commonwealth Integrating Authorities adhere to strict protections and data standards when creating linked data sets. At the AIHW, an Ethics Committee reviews each linkage project to ensure that it complies with applicable legislation and individual privacy guidelines. As well, many research data sets are adjusted before release to researchers to reduce the risk of disclosure of personal information. These adjustment processes can include de-identification, where information that would identify individuals is removed to protect an individual’s privacy.

Further privacy protection is ensured by adhering to the 'separation principle'. This principle, which is embedded in the processes of all integrating authorities, requires that directly identifiable information (for example, names, addresses) and content data (for example, instances of services used) are kept separately. This means that the people able to identify subjects of the data are not able to learn any information about them, further minimising any risk to people's privacy.

Other codes and guidelines ensure research integrity and the protection of privacy. The Australian Code for the Responsible Conduct of Research provides a framework for institutions engaged in research to develop appropriate procedures and codes of conduct (NHMRC 2016). The National Statement on Ethical Conduct in Human Research contains guidelines used by researchers and ethics committees. These guidelines cover areas such as ethical review, risk management, patient consent and lines of responsibility (NHMRC 2013).

## Where to from here?

Technology—in particular, digital technology—has had a huge impact on data generation, access and availability. The increasing opportunities for secondary use of data promise that Australians' health can be improved through the appropriate use of high-quality, useable information from new and existing sources. Two of the biggest influences on the future of secondary use of health data will be the growth in data availability and the trend towards 'open data'. These trends come with increased risks to privacy and steps need to be taken to ensure privacy protections keep pace with technological advances.

## More health data available

The increased use of technology in providing health care is one of the biggest drivers behind the growth in health data. Electronic patient medical records, such as the Australian Government's My Health Record, are 'one of the most visible aspects of the increasing proliferation of data in health care' (Stanford Medicine 2017:14). The My Health Record is a secure online summary that combines health data from multiple sources (see Chapter 2.4 'Digital health'). By the end of 2018, every Australian who has not opted out of the program will receive their own My Health Record (ADHA 2018).

While the primary use of My Health Record is to store and make available individuals' medical information, it also provides a rich opportunity for secondary use of data. At the time of writing, there have been no secondary uses of these data. However, the Framework to guide the secondary use of My Health Record system data was released and the AIHW was appointed to manage and release My Health Record data for secondary purposes (Department of Health 2018).

Further to this, the all-encompassing presence of technology in our daily lives—wearing pedometers and heart rate monitors on our wrists, and tracking our exercise from smartphones—means that the potential for data provision and use is expanding rapidly. The share of global health data taken up by connected devices is expected to more than double between 2016 and 2020 (EMC 2014). Patient monitors and video cameras are examples of these connected devices—they are components of the so-called 'Internet of Things'. The data generated by these devices offer a rich opportunity for secondary uses.

## Open data

As more data become available, greater access—particularly to person-centred data—will continue to unlock added value from these data assets. Open data are used to describe data sources that have little to no restrictions on their access and use. However, due to the sensitivity and personal nature of many types of health data, most individual-level health data will not be open and must be treated with appropriate respect for an individual's privacy. In practice, there are still many open data sources relevant to health research; for example, data bases on the weather are relevant to researching seasonal illnesses such as influenza.

There has been a push for increasing access to government data and the availability of open data resources. Technological developments can enable personal health information, such as that collected by mobile devices, to be combined with open data sources to provide more relevant real-time data to users, practitioners and researchers. Where health data sources are not classified as open data, de-identified views and extracts may be prepared to be compatible with a wider variety of future uses.

## Challenges ahead

The opportunities presented by the increasing availability and scope of health data are enormous, but there are also challenges. As this article has stated, one of the main challenges is how to ensure that potential gains of data sharing and secondary use do not impinge on the privacy of individuals.

The variety of different types of information poses a challenge when it comes to the use of the data. Secondary use of administrative and other data sets can be very insightful, given their reach and scope, but these data also have limitations. Examples of limitations can include poor documentation, small numbers of data items, and uncertainty about the quality of information (Jorm 2015). Assuring that health data collections are inter-operable ensures that the technical challenges inherent in using research data are minimised, and that the promise of secondary data use can be realised.

### What is missing from the picture?

While the potential benefit from secondary use of health information is great, it is dependent on an understanding of the health information landscape. This requires knowledge of what health data are currently collected, where gaps and overlaps exist and the priority areas for researchers and policy makers. There is currently no holistic approach to implementing a national health information strategy. A coordinated, strategic approach to identify gaps, overlaps and priorities would further enhance the use of national health data assets.

### Where do I go for more information?

More information on AIHW, what we do, our privacy policy and our data governance is available at <[www.aihw.gov.au/about-us](http://www.aihw.gov.au/about-us)>.

The Framework to guide the secondary use My Health Record system data is available at <[www.health.gov.au/internet/main/publishing.nsf/Content/eHealth-framework](http://www.health.gov.au/internet/main/publishing.nsf/Content/eHealth-framework)>.

## References

- ABS (Australian Bureau of Statistics) 2016. Household use of information technology, Australia, 2014–15. ABS cat. no. 8146.0. Canberra: ABS. Viewed 29 January 2018, <<http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/8146.0Main+Features12014-15?OpenDocument>>.
- ADHA (Australian Digital Health Agency) 2018. Welcome to My Health Record. Canberra: ADHA. Viewed 29 January 2018, <<https://myhealthrecord.gov.au/internet/mhr/publishing.nsf/content/home>>.
- AIHW (Australian Institute of Health and Welfare) 2017a. Approved AIHW linkage projects. Canberra: AIHW. Viewed 29 January 2018, <<https://www.aihw.gov.au/our-services/data-linkage/approved-aihw-linkage-projects>>.
- AIHW 2017b. Incidence of suicide among serving and ex-serving Australian Defence Force personnel 2001–2015: in brief summary report. Cat. no. PHE 213. Canberra: AIHW.
- Beckmann KR, Bennett A, Young GP & Roder DM 2014. Treatment patterns among colorectal cancer patients in South Australia: a demonstration of the utility of population-based data linkage. *Journal of Evaluation in Clinical Practice* 20:467–77.
- Brown J 2015. Using social media data to identify outbreaks and control disease. Folsom, CA: Government Technology. Viewed 29 January 2018, <<http://www.govtech.com/data/Using-Social-Media-Data-to-Identify-Outbreaks-and-Control-Disease.html>>.
- Department of Health 2018. Framework to guide the secondary use of My Health Record system data, May 2018. Canberra: Department of Health.
- EMC Corporation 2014. The digital universe: driving data growth in healthcare. EMC Corporation. Viewed 29 January 2018, <<https://www.emc.com/analyst-report/digital-universe-healthcare-vertical-report-ar.pdf>>.
- Jorm L 2015. Routinely collected data as a strategic resource for research: priorities for methods and workforce. *Public Health Research and Practice* 25(4).
- Kaiser DW, Harrington RA & Turakhia MP 2016. Wearable fitness trackers and heart disease. *JAMA Cardiology* 1(2):239.
- NHMRC (National Health and Medical Research Council) 2013. Summary of national statement content. Canberra: NHMRC. Viewed 28 January 2018, <<https://www.nhmrc.gov.au/research/responsible-conduct-research/summary-national-statement-content>>.
- NHMRC 2016. Australian code for the responsible conduct of research. Canberra: NHMRC. Viewed 28 January 2018, <<https://www.nhmrc.gov.au/guidelines-publications/r39>>.
- NSS (National Statistical Service) 2014. Accredited integrating authorities. Canberra: NSS. Viewed 28 January 2018, <<http://www.nss.gov.au/nss/home.nsf/pages/Data%20Integration:%20Accredited%20Integrating%20Authorities>>.
- OAIC (Office of the Australian Information Commissioner) n.d. Health information and medical research. Canberra: OAIC. Viewed 28 January 2018, <<https://www.oaic.gov.au/privacy-law/privacy-act/health-and-medical-research>>.
- Productivity Commission 2017. Data availability and use. Report no. 82, Canberra: Productivity Commission.
- Research Australia 2017. Australia speaks! Research Australia 2017 public opinion polling. Darlinghurst: Research Australia. Viewed 29 January 2018, <<https://researchaustralia.org/wp-content/uploads/2017/08/2017-Opinion-Poll-Digital.pdf>>.
- Stanford Medicine 2017. Harnessing the power of data in health. Viewed 28 January 2018, <<https://med.stanford.edu/content/dam/sm/sm-news/documents/StanfordMedicineHealthTrendsWhitePaper2017.pdf>>.

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# Chapter 3

## Causes of ill health



## 3.0 Overview

Most Australians are affected by ill health at some point in their life. For some, the effects of the illness or injury will be short term; for others, they can be long lasting and have a severe impact on their quality of life. This chapter provides information on the leading causes of ill health in Australia, including cancer, cardiovascular disease mental health conditions and musculoskeletal conditions. It also features specific diseases and injuries that are important for subsets of the population: mesothelioma; eating disorders; family, domestic and sexual violence; opioid harm; and communicable diseases. This overview highlights some, but not all, causes of ill health presented in this chapter.

Burden of disease analysis is one way to measure the impact of different diseases or injuries on a population. It combines the burden of living with ill health and the burden of dying prematurely. For all ages combined, the leading cause of total disease burden in Australia in 2011 was coronary heart disease, followed by lung cancer for males and other musculoskeletal conditions for females. The leading causes differ across age groups, reflecting that people experience different health problems at different stages of their life. For example, for children aged 5–14, the top 3 causes of total disease burden were asthma, anxiety disorders and depressive disorders; for Australians aged 85–94, they were coronary heart disease, dementia and stroke.

Cause of death information is another way to identify leading causes of ill health in a population. In 2016, coronary heart disease was the leading cause of death in Australia for males, and dementia and Alzheimer disease for females. The leading causes of death also differ across age groups. In general, external causes such as land transport accidents, suicide and accidental poisoning are more prominent among people aged 15–44, while chronic conditions are more prominent among people aged 45 and over.

Most illness and deaths in Australia are caused by chronic conditions. Chronic conditions can place a high burden on individuals, their families and carers, and the health system. It is estimated that 1 in 2 (50%) Australians have at least one of 8 selected common chronic conditions: arthritis, asthma, back pain and problems, cancer, cardiovascular disease, chronic obstructive pulmonary disease, diabetes, and mental health conditions. Collectively, these conditions accounted for 61% of the total disease burden in 2011 and contributed to 87% of deaths in 2015.

Cancer is a diverse group of several hundred diseases; collectively, cancer is the greatest cause of disease burden in Australia, accounting for around one-fifth (19%) of the total disease burden. It is estimated that about 380 people will be diagnosed with cancer and 133 people will die from cancer every day this year—that is about 138,300 new cases and 48,600 deaths in 2018. The most commonly diagnosed cancers in 2018 will be prostate cancer for males and breast cancer for females. Mesothelioma has the lowest 5-year relative survival of all cancer types at 6.4%. The main cause of mesothelioma is exposure to asbestos, and Australia has one of the highest rates of mesothelioma incidence in the world.

Coronary heart disease is the leading specific cause of total burden of disease in Australia, accounting for 7.7% of the total disease burden. It affects about 1 in 30 adults (3.3%, 645,000 people), and 1 in 6 people aged 75 and over. Every day in Australia, about 170 people aged 25 and over experience an acute coronary event (a heart attack or unstable angina).

Diabetes is an area of health concern for Australia. Prevalence of the disease has tripled over the last 25 years, and 6.1% of the adult population (1.2 million people) self-report having diabetes. Death rates for people with diabetes are almost double those for the general Australian population.

Two common chronic conditions are musculoskeletal conditions and chronic respiratory conditions—each of which affects around 1 in 3 Australians. Nearly 6.9 million Australians have musculoskeletal conditions such as arthritis, back pain and osteoporosis and about 7 million Australians are affected by chronic respiratory conditions such as hay fever and asthma.

Almost half (45%) of Australians 16–85 will experience a mental disorder such as depression, anxiety or substance use disorder at some stage in their life; an estimated 20% of adult population and 14% of children and young people experienced a mental health disorder in the past 12 months. Eating disorders are a group of mental illness which affect anywhere from 4–16% of the population. Eating disorders were the 10th leading cause of non-fatal disease burden for females aged 15–44 years in 2011, and are of particular concern for younger females.

Dementia is a growing challenge for Australia as the population ages and life expectancy increases. In 2018, 376,000 Australians will have dementia and 61% of people with dementia will be female. In 2016, dementia replaced heart disease as the leading underlying cause of death for females and remained the third leading cause of death for males.

Family, domestic and sexual violence causes more illness, disability and premature death for women aged 25–44 than any other risk factor. Exposure to intimate partner violence is linked to depressive and anxiety disorders, early pregnancy loss, homicide and violence, suicide and self-inflicted injuries, alcohol use disorders, and children born prematurely or with low birthweight. One in 6 (17%, or 1.6 million) Australian women have experienced physical or sexual violence by a current or former cohabiting partner, since the age of 15. Serious cases can end in hospitalisation or death.

The use and misuse of opioid drugs can result in overdose and physical harm. Australian statistics show recent increases in opioid-related poisonings, overdoses and deaths—between 2007 and 2016, there was an 89% increase in drug-induced deaths involving opioids, and between 2011–12 and 2015–16, opioid-related hospitalisations increased by 12%.

## 3.1 Burden of disease across the life stages

People experience different health problems at different times of their lives—from infancy and childhood through to old age. Hence, they have different health needs at different life stages. This snapshot presents the leading causes of total burden at each life stage. Life stages are broadly divided into infants, children and young people (aged 0–24), working-age adults (aged 25–74) and older people (aged 75 and over).

Burden of disease analysis is useful to measure the impact of different diseases or injuries on a population. It combines the burden of living with ill health (non-fatal burden) with the burden of dying prematurely (fatal burden). See Box 4.4.1 in Chapter 4.4 'Contribution of selected risk factors to burden of disease' for an explanation of burden of disease analysis.

Disability-adjusted life years (DALYs) is a summary measure of disease burden. One DALY is 1 year of 'healthy life' lost due to illness and/or death—the more DALYs associated with a disease or injury, the greater the burden of that disease.

In 2011, 4.5 million DALYs were lost due to illness or premature death.

For all ages combined, the leading cause of total burden was coronary heart disease, at 7.7% of total burden, followed by lung cancer for males and other musculoskeletal conditions for females (Figure 3.1.1).

Figure 3.1.1: Leading causes of total burden, by sex, 2011

	1st	2nd	3rd	4th	5th
<b>Males</b>	Coronary heart disease (9.4%)	Lung cancer (3.9%)	Other musculoskeletal (3.6%)	Suicide and self-inflicted injuries (3.5%)	Back pain and problems (3.4%)
<b>Females</b>	Coronary heart disease (5.8%)	Other musculoskeletal (4.6%)	Dementia (4.6%)	Anxiety disorders (4.1%)	Back pain and problems (3.9%)
<b>Persons</b>	Coronary heart disease (7.7%)	Other musculoskeletal (4.1%)	Back pain and problems (3.6%)	COPD (3.6%)	Lung cancer (3.4%)

■ Cancer ■ Cardiovascular ■ Respiratory ■ Injuries ■ Neurological ■ Mental ■ Musculoskeletal

COPD = chronic obstructive pulmonary disease.

Source: Australian Burden of Disease Study 2011; Table S3.1.1.

# Infants, children and young people (aged 0–24)

Infant and congenital conditions accounted for most of the burden in children aged under 5; the 5 leading causes of burden in this age group were all from this disease group (Figure 3.1.2). Nearly three-quarters (72%) of the total burden in this age group were experienced by infants. Among children aged 1–4, other mental disorders (for example, sleep disorders and separation anxiety), asthma and other gastrointestinal infections were the causes contributing the most burden.

Among children aged 5–14, asthma was the leading cause of burden, closely followed by anxiety disorders (Figure 3.1.2). The 5 leading causes of burden in this age group were either mental and substance abuse disorders or respiratory diseases. While asthma and anxiety disorders were the leading 2 causes of burden among boys aged 5–14, this order was reversed among girls in this age group (Supplementary Table S3.1.1). Dental caries also featured in the 10 leading causes of burden among children aged 5–14, reflecting the importance of oral and dental health.

Suicide and self-inflicted injuries and anxiety disorders were the leading causes of burden in young people aged 15–24 (Figure 3.1.2). Among young males, suicide and self-inflicted injuries was the leading cause of burden, followed by alcohol use disorders (Supplementary Table S3.1.1). Among young females, anxiety and depressive disorders were the leading 2 causes of burden.

**Figure 3.1.2: Leading causes of total burden among people aged 0–24, by age, 2011**

Age group	1st	2nd	3rd	4th	5th
Under 5	Preterm birth and low birthweight complications (16%)	Birth trauma and asphyxia (12%)	Other disorders of infancy (7.2%)	Sudden infant death syndrome (6.3%)	Other congenital conditions (5.5%)
5–14	Asthma (11%)	Anxiety disorders (10%)	Depressive disorders (7.0%)	Conduct disorder (5.8%)	Upper respiratory conditions (5.5%)
15–24	Suicide and self-inflicted injuries (8.4%)	Anxiety disorders (7.5%)	Depressive disorders (6.8%)	Alcohol use disorders (5.6%)	Asthma (5.4%)

■ Infant/congenital ■ Respiratory ■ Mental ■ Injuries

Source: Australian Burden of Disease Study 2011; Table S3.1.1.

## Working-age adults (aged 25–74)

Young working-age adults (25–44) experience anxiety disorders as the leading cause of burden, with back pain and problems a close second (Figure 3.1.3). While suicide and self-inflicted injuries is ranked third among leading causes of burden in this age group, it continues to be the leading cause among men aged 25–44 (Supplementary Table S3.1.1).

Coronary heart disease is the leading cause of burden in adults aged 45–64 and persists as the leading cause for all but the oldest age group (figures 3.1.3, 3.1.4). Other musculoskeletal conditions and back pain and problems round out the top 3 causes of burden in this age group. Coronary heart disease is a far greater health problem for men in this age group than for women: men experienced nearly 4 times the burden due to this disease (76,900 DALYs for men compared with 19,500 DALYs for women). The leading cause of disease burden for women aged 45–64 was other musculoskeletal conditions, followed by breast cancer (Supplementary Table S3.1.1).

The older working-age population (aged 65–74) experienced an increasing burden from coronary heart disease (Figure 3.1.3). Chronic conditions such as lung cancer, chronic obstructive pulmonary disease (COPD) and other musculoskeletal conditions made up the top 5.

**Figure 3.1.3: Leading causes of total burden among people aged 25–74, by age, 2011**

Age group	1st	2nd	3rd	4th	5th
25–44	Anxiety disorders (6.7%)	Back pain and problems (6.5%)	Suicide and self-inflicted injuries (6.4%)	Depressive disorders (6.3%)	Other musculoskeletal (4.7%)
45–64	Coronary heart disease (7.5%)	Other musculoskeletal (5.7%)	Back pain and problems (5.0%)	Lung cancer (4.8%)	Anxiety disorders (3.4%)
65–74	Coronary heart disease (10%)	Lung cancer (6.9%)	COPD (6.4%)	Other musculoskeletal (4.5%)	Diabetes (3.6%)

■ Cancer ■ Cardiovascular ■ Respiratory ■ Mental ■ Endocrine ■ Musculoskeletal ■ Injuries

COPD = chronic obstructive pulmonary disease.

Source: Australian Burden of Disease Study 2011; Table S3.1.1.

# Older people (aged 75 and over)

The burden from coronary heart disease was highest among older people aged 75–84 (88,050 DALYs; Figure 3.1.4). Dementia was the second leading cause of burden, followed by COPD, stroke and lung cancer. These diseases are also the 5 leading causes of death in Australia (see Chapter 3.2 ‘Leading causes of death’).

Dementia is more prominent among older people aged 85–94 (Figure 3.1.4). While coronary heart disease is the leading cause of burden in this age group, dementia is a close second, and is the leading cause among women aged 85–94 (Supplementary Table S3.1.1). Stroke is the third leading cause of burden in this age group, among both men and women. The leading causes of burden among very old people (aged 95 and over) includes chronic conditions (dementia, coronary heart disease and stroke; Figure 3.1.4). The top 5 also include infections and injuries, which can be more hazardous to a person’s health in older age.

**Figure 3.1.4: Leading causes of total burden among people aged 75 and over, by age, 2011**

Age group	1st	2nd	3rd	4th	5th
75–84	Coronary heart disease (13%)	Dementia (7.7%)	COPD (6.8%)	Stroke (6.1%)	Lung cancer (4.5%)
85–94	Coronary heart disease (17%)	Dementia (15%)	Stroke (8.6%)	COPD (4.9%)	Diabetes (2.7%)
95+	Dementia (21%)	Coronary heart disease (19%)	Stroke (9.2%)	Lower respiratory infections (3.1%)	Falls (2.8%)

■ Infections ■ Cancer ■ Cardiovascular ■ Respiratory ■ Neurological ■ Endocrine ■ Injuries

COPD = chronic obstructive pulmonary disease.

Source: Australian Burden of Disease Study 2011; Table S3.1.1.

## What is missing from the picture?

The Australian Burden of Disease Study 2011 is based on the best available data, and applies methods suited to the Australian context. Yet, there are some limitations to burden of disease analysis, including methods and available data. See *Australian Burden of Disease Study: impact and causes of illness and death in Australia 2011* for a more detailed discussion of these limitations.

## Where do I go for more information?

More information on the Australian Burden of Disease Study is available at [www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/burden-of-disease/overview](http://www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/burden-of-disease/overview).

The report *Australian Burden of Disease Study: impact and causes of illness and death in Australia 2011* and other recent releases are available for free download.

## 3.2 Leading causes of death

Leading causes of death is a useful measure of population health. It is of most value when making comparisons over time or between population groups. Changes in the pattern of causes of death can result from changes in behaviours, exposures to disease or injury, and social and environmental circumstances, as well as from data coding practices (Box 3.2.1).

### Box 3.2.1: Deaths data

Causes of death are documented on death certificates by medical practitioners or coroners, and coded by the Australian Bureau of Statistics using the World Health Organization International Statistical Classification of Diseases and Related Health Problems (ICD).

The ICD allows diseases that cause death to be grouped in a way that is meaningful for monitoring population health. The AIHW uses the disease groups recommended by the World Health Organization (Becker et al. 2006), with minor modifications to suit the Australian context.

Leading causes of death presented in this snapshot are based on the 'underlying cause of death', which is the disease or injury that began the train of events leading to death.

Most deaths, however, result from more than one contributing disease or condition. Analyses using 'associated causes of death' may offer insight into the disease processes occurring at the end of life or, for injury causes of death, the nature of the injury.

### What are the leading causes of death in Australia?

There were 158,500 deaths in Australia in 2016 (81,900 males; 76,600 females).

The age-standardised death rate for males was 1.4 times as high as for females (637 per 100,000 males and 448 per 100,000 females).

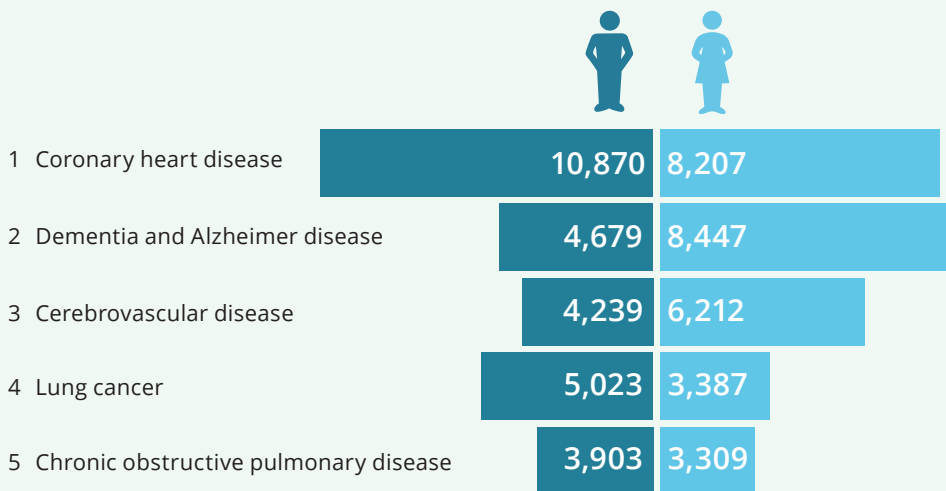
Death rates generally increase with increasing age. However, the death rates among males aged 15–29 are more than twice as high as for females of the same age; specifically, for men aged 20–24, the death rate is 2.6 times as high as for women of the same age.

The leading cause of death for males was coronary heart disease, accounting for 10,870 (13%) deaths. Dementia and Alzheimer disease was the leading cause of death for females, accounting for 8,447 (11%) deaths, closely followed by coronary heart disease (8,207; 11% of deaths). Cerebrovascular disease (which includes stroke), lung cancer and chronic obstructive pulmonary disease (COPD) make up the top 5 leading underlying causes of death in Australia in 2016 for males and females of all ages combined (Figure 3.2.1).



Males account for more deaths due to coronary heart disease, lung cancer and COPD. Females account for the majority of deaths due to cerebrovascular disease and dementia and Alzheimer disease.

**Figure 3.2.1 Leading causes of death, by sex, 2016**



*Note:* Leading causes of death are based on underlying causes of death and classified using an AIHW-modified version of Becker et al. 2006.

*Source:* National Mortality Database; Table S3.2.1.

## Leading causes of death by age

As well as differences by sex, the leading causes of death also vary by age. Chronic conditions feature more prominently among people aged 45 and over, while the leading causes of death among people aged 1–44 are external causes, such as accidents and suicides (Figure 3.2.2).

Among infants, perinatal and congenital conditions caused most deaths (77% of deaths).

Land transport accidents were the most common cause of death among children aged 1–14 (12%). Suicide was the leading cause of death among people aged 15–24 (34%), followed by land transport accidents (21%). For people aged 25–44, it was also suicide (21%), followed by accidental poisoning (12%).

Coronary heart disease was the leading cause of death for people aged 45–64, followed by lung cancer. For people aged 65–74, it was also lung cancer followed by coronary heart disease. Dementia and Alzheimer disease was the second leading cause of death among people aged 75 and over, behind coronary heart disease.

Figure 3.2.2: Leading causes of death, by age group, 2014–2016

Age group	1st	2nd	3rd	4th	5th
Under 1	Perinatal and congenital conditions	Other ill-defined causes	SIDS	Spinal muscular atrophy	Accidental threats to breathing
1–14	Land transport accidents	Perinatal and congenital conditions	Accidental drowning and submersion	Brain cancer	Other ill-defined causes
15–24	Suicide	Land transport accidents	Accidental poisoning	Assault	Other ill-defined causes
25–44	Suicide	Accidental poisoning	Land transport accidents	Coronary heart disease	Other ill-defined causes
45–64	Coronary heart disease	Lung cancer	Suicide	Breast cancer	Colorectal cancer
65–74	Lung cancer	Coronary heart disease	COPD	Cerebrovascular disease	Colorectal cancer
75 and over	Coronary heart disease	Dementia and Alzheimer disease	Cerebrovascular disease	COPD	Lung cancer

SIDS = sudden infant death syndrome.

Note: 'Other ill-defined causes' include the following codes: Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (ICD-10 codes R00–R99, excluding R95: SIDS; Cardiac arrest, unspecified (I46.9); Respiratory failure of newborn (P28.5); Other unspecified convulsions (R56.8). AIHW General Record of Incidence of Mortality (GRIM) books are available for selected leading causes of death.

Source: National Mortality Database; Table S3.2.2.

## Have leading causes of death changed over time?

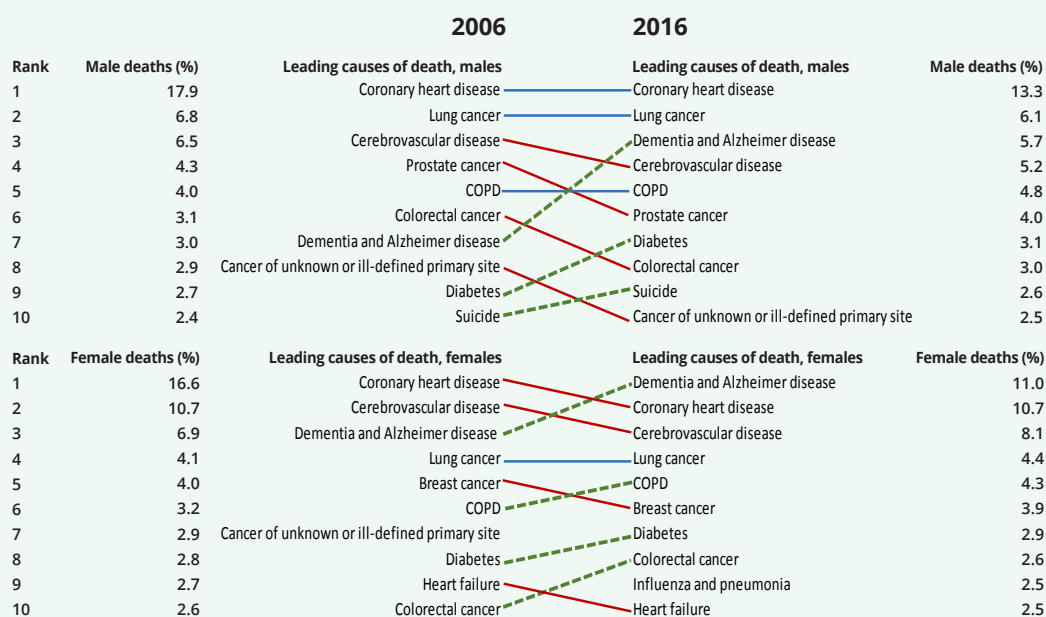
In Australia, mortality rates have continued to decline since at least the early 1900s. The age-standardised death rate fell by 69% between 1910 and 2015 for males, and by 73% for females. The leading causes of death in the early 1900s were diseases of the circulatory system.

The 10 leading causes of death in 2016 were generally the same as in 2006, albeit with different rankings (Figure 3.2.3).

- For males, coronary heart disease was the leading cause of death in both these years, accounting for 18% of deaths in 2006 and 13% in 2016. Though it was the leading cause of death in both years, the death rate from coronary heart disease fell substantially over the decade. The largest change in leading causes of death for males from 2006 to 2016 was the rise of dementia and Alzheimer disease, from seventh to third place. Diabetes and suicide also rose in rank over this period.
- For females, coronary heart disease, cerebrovascular disease, breast cancer and heart failure fell in rank from 2006 to 2016. On the other hand, there were notable

increases—for dementia and Alzheimer disease (from third to first place) and for COPD (from sixth to fifth place). Cancer of unknown or ill-defined primary site moved out of the 10 leading causes of death for females in 2006 and was replaced by influenza and pneumonia in 2016.

**Figure 3.2.3: Leading causes of death, by sex, 2006 and 2016**



**Notes**

1. Rankings are based on the number of deaths; a decline in rank does not necessarily mean a decline in the number of deaths.
2. Data for 2016 are based on the preliminary version of cause of death data and are subject to further revision by the Australian Bureau of Statistics.
3. Coloured lines link the leading causes of death in 2006 with those in 2016: a blue line means that the ranking of the cause of death remained the same in 2016 as in 2006; a green line, that the ranking of the cause of death rose compared with that in 2006; and a red line, that the ranking of the cause of death in 2016 decreased compared with that in 2006.

Source: National Mortality Database; Table S3.2.3.

## Do the leading causes of death vary among population groups?

Leading causes of death differ among population groups. This may be driven by variations in the population characteristics, causes of death at different ages, the prevalence of illness and risk factors, and access to health services. For example, mortality rates in *Remote* and *Very remote* areas are higher than in *Major cities*. These disparities can be amplified by higher rates of illness among Aboriginal and Torres Strait Islander people, who make up a greater proportion of the population in more remote areas.

## Indigenous Australians

- In 2012–2016, the 5 leading causes of death for Indigenous Australians were coronary heart disease, diabetes, COPD, lung cancer and suicide.
- For Indigenous Australians, the age-standardised mortality rate for diabetes was almost 6 times as high as for non-Indigenous Australians (64 compared with 11 deaths per 100,000 population). For COPD, it was 3 times as high (52 compared with 17 deaths per 100,000).

## Remoteness areas

- Coronary heart disease was the leading cause of death across all areas (cities, regional and remote areas) in 2011–2015; in *Very remote* areas, the age-standardised mortality rate was 1.7 times as high as in *Major cities*.
- Diabetes was the second leading cause of death in *Very remote* areas and the seventh in *Major cities*—the age-standardised mortality rate was almost 4 times as high in *Very remote* areas as in *Major cities*.

## Socioeconomic areas

- The five leading causes of death (see Figure 3.2.1) were common in all five socioeconomic areas in 2011–2015.
- For people living in the lowest socioeconomic area, age-standardised mortality rates for diabetes, COPD, lung cancer and suicide were about twice as high as for people living in the highest socioeconomic area.

Mortality data for 2016 by remoteness area and socioeconomic area were not available at the time of writing.

## What is missing from the picture?

- Socioeconomic factors such as highest level of education achieved and main occupation are known to be associated with mortality and particular causes of death. These individual measures are not collected in Australian deaths data. However, analysis of such factors is possible with linked health data.
- Deaths information is not the only measure of impact of disease in a population. Burden of disease analyses, for example, measure both the impact of living with disease and injury and dying prematurely (see Chapter 3.1 'Burden of disease across the life stages').

## Where do I go for more information?

More information on deaths and leading causes of death in Australia—including the General Incidence of Mortality (GRIM) books and Mortality Over Regions and Time (MORT) books—is available on the AIHW website at <[www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/life-expectancy-deaths/overview](http://www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/life-expectancy-deaths/overview)>.

The annual Australian Bureau of Statistics publications *Deaths, Australia, 2016* (ABS 2017b) and *Causes of death, Australia, 2016* (ABS 2017a) also provide the latest information on mortality in Australia.

Data visualisation on the burden of disease provides data on the years of life lost and number of deaths by diseases and is available at <[www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/burden-of-disease/overview](http://www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/burden-of-disease/overview)>.

## References

ABS (Australian Bureau of Statistics) 2017a. Causes of death, Australia, 2016. ABS cat no. 3303.0. Canberra: ABS.

ABS 2017b. Deaths, Australia, 2016. ABS cat no. 3302.0. Canberra: ABS.

Becker R, Silvi J, Ma Fat D, L'Hours A & Laurenti R 2006. A method for deriving leading causes of death. Bulletin of the World Health Organization 84:297–304.



## 3.3 Chronic conditions

Chronic conditions are a substantial global, national and individual health issue, contributing to both premature mortality and morbidity. Globally, they are leading causes of disease burden, responsible for around 70% of deaths worldwide (WHO 2017a).

Nationally, rates of chronic conditions and their associated risk factors are increasing; this has a heavy impact on the Australian health care system. At an individual level, Australians diagnosed with one or more chronic conditions often have complex health needs, die prematurely and have poorer overall quality of life.

Chronic conditions are generally long-lasting and, given Australia's ageing population, their treatment and management are needed for longer periods of an individual's life.

The term 'chronic condition' refers to a wide range of conditions, illnesses and diseases, which are detailed in Box 3.3.1.

### Box 3.3.1: Definitions for chronic conditions

Defining chronic conditions is complex as the term covers a number of broad health and disease and management concepts.

Chronic conditions are generally characterised by their long-lasting and persistent effects. Once present, they often persist throughout a person's life, so there is generally a need for long-term management by individuals and health professionals. They are also called non-communicable diseases or long-term conditions and are referred to as such in data sources cited in this article.

The most common chronic conditions include cardiovascular disease (such as coronary heart disease and stroke), cancer (such as breast and colorectal cancer), chronic respiratory conditions (such as chronic obstructive pulmonary disease and asthma), chronic musculoskeletal conditions (such as arthritis and back pain), diabetes, and mental health conditions (such as depression). Based on self-reported survey data, almost 1 in 5 (18%) Australians had cardiovascular disease, 18% had mental health conditions and 16% had back pain and problems in 2014–15. Prevalence of chronic conditions also varied by age—mental health conditions and asthma were more common in people aged under 45, while cardiovascular disease and arthritis were more common in older age groups (ABS 2015).

In the broadest sense, chronic conditions include infectious diseases that persist in the long term (sometimes for life), such as chronic hepatitis B and human immunodeficiency virus (HIV), congenital disorders such as spina bifida, genetic disorders such as cystic fibrosis and other conditions, and disorders or disability stemming from injury such as limb amputation.

Chronic condition comorbidity (or multimorbidity) is the presence of two or more chronic conditions at the same time. Around 1 in 4 (23%) Australians had two or more chronic conditions in 2014–15 (ABS 2015). Comorbidity was the focus of a feature article in *Australia's health 2016*, based largely on data from the Australian Bureau of Statistics 2014–15 National Health Survey; it is a good baseline reference for this subject (see section 'Where do I go for more information?').

This article summarises the increasing global, Australian and individual burden of chronic conditions, describes interventions aiming to combat this trend and provides the context for condition-specific information presented elsewhere in this chapter.

## Global picture and trends

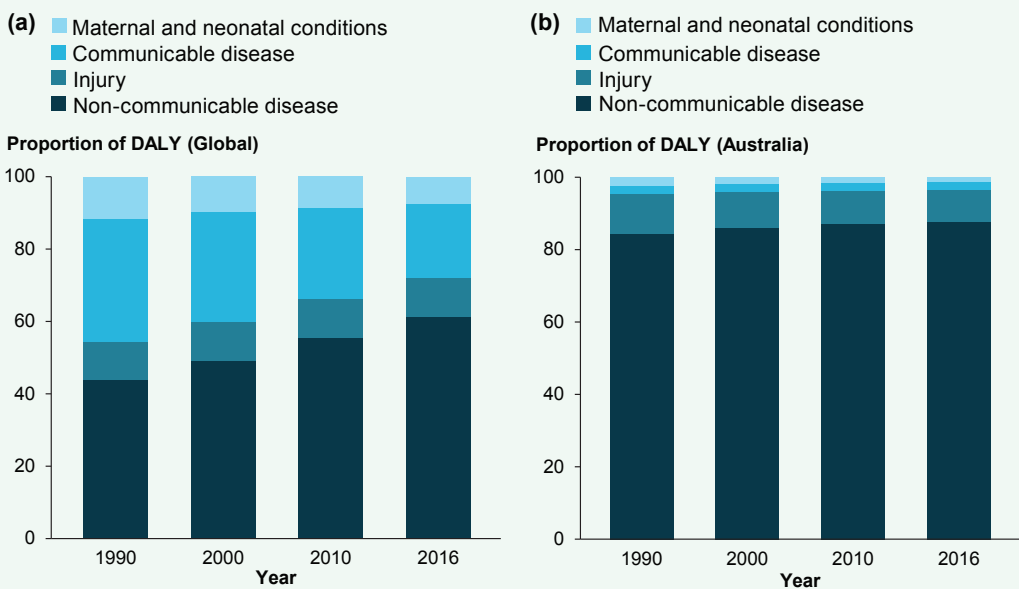
Non-communicable (chronic) disease is a global health problem. The burden of chronic disease exceeds that of communicable (infectious) disease and deaths from chronic disease disproportionately affect lower income countries and populations, threatening sustainable development (WHO 2017a, 2017b).

Disease burden or impact can be measured by the disability-adjusted life year (DALY), equivalent to a single year of 'healthy' life lost due to illness and/or death (see Chapter 4.4 'Contribution of selected risk factors to burden of disease'). Data from the Global Burden of Disease Study 2016 show that the share of the total global DALYs due to non-communicable disease has:

- increased steadily globally (from 44% in 1990 to 61% in 2016), while the proportion attributable to communicable (infectious) disease fell (from 34% to 21%)
- remained steady in Australia at around 84–88% (compared with 2.2–2.4% for communicable disease and 8.8–11% for injury) (Figure 3.3.1).

In lower income countries, the increase in the relative burden from non-communicable disease and the decrease in communicable disease burden is occurring more rapidly than in high-income countries (including Australia). While this shift in the distribution of the disease burden toward non-communicable disease is seen globally, there are some regions where communicable disease is still a major health issue.

**Figure 3.3.1: Burden of communicable disease, injury, maternal and neonatal conditions and non-communicable disease, (a) globally and (b) in Australia, 1990, 2000, 2010 and 2016**

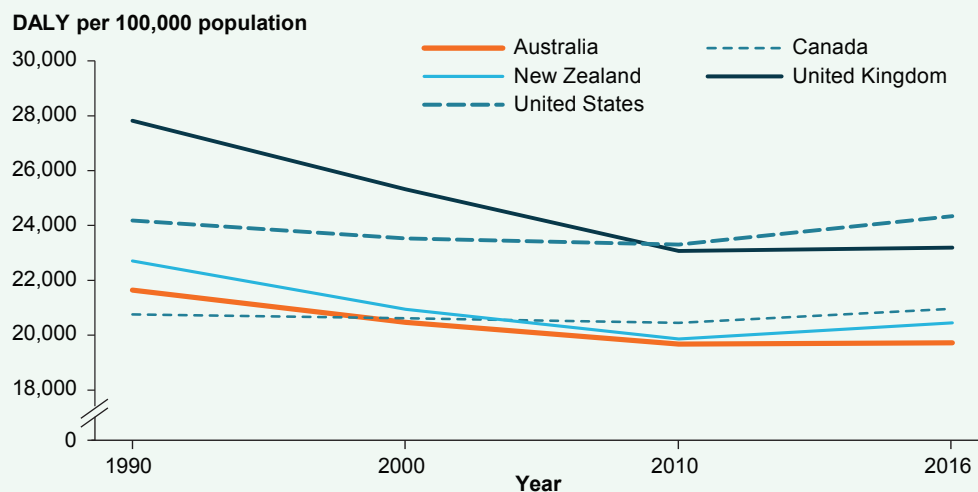


Source: GBD Collaborative Network 2017; Table S3.3.1.

Although the share of total burden due to non-communicable disease is high in Australia, the rate of that burden has fallen over time—a positive sign. Between 1990 and 2016, the rate of DALY for non-communicable disease in Australia:

- decreased from more than 21,600 to more than 19,700 DALYs per 100,000 population
- was second lowest among selected high-income countries in 1990 (after Canada), and lowest in 2016 (Figure 3.3.2).

**Figure 3.3.2: Rate of non-communicable disease burden, Australia and selected high-income countries, 1990, 2000, 2010 and 2016**

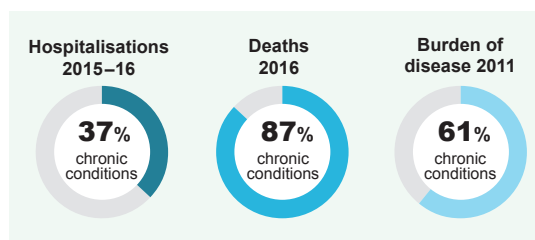


Source: GBD Collaborative Network 2017; Table S3.3.2.

## A big problem for Australia

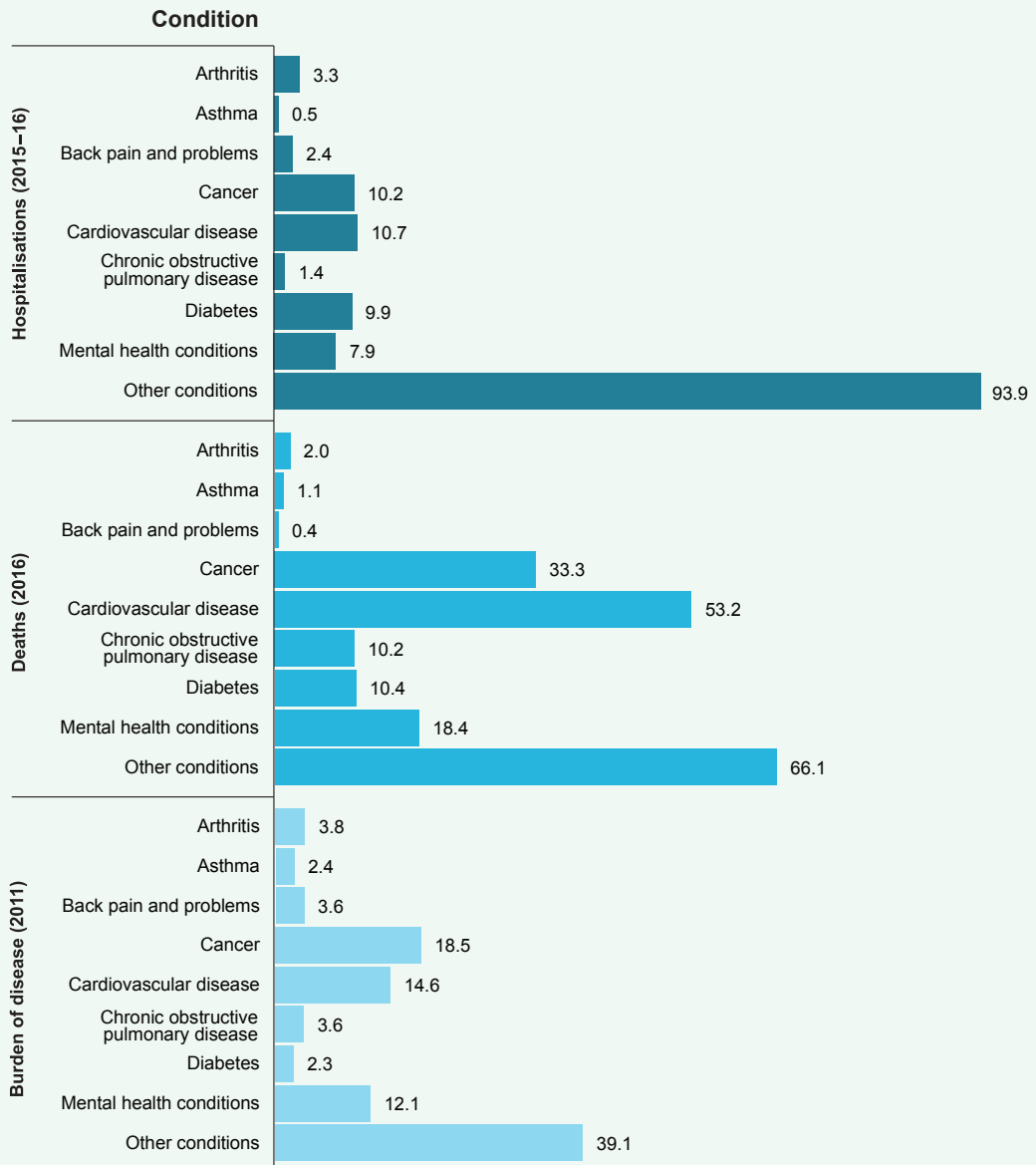
Chronic conditions have a substantial impact in Australia—for the population, the health system and individuals. Self-reported survey data from 2014–15 reveals that 1 in 2 (50%) Australians had at least 1 of 8 selected common chronic conditions: arthritis, asthma, back pain and problems, cancer, cardiovascular disease, chronic obstructive pulmonary disease (COPD), diabetes, and mental health conditions (ABS 2015). These conditions:

- were involved in 37% of hospitalisations (based on principal or additional diagnosis) in 2015–16
- contributed to 87% of deaths (based on underlying or associated causes of death) in 2015
- accounted for 61% of the total burden of disease in Australia in 2011, based on the Australian Burden of Disease Study 2011 (Figure 3.3.3). (Note that estimates from this study are not directly comparable with those from the Global Burden of Disease Study due to differences in methods and data sources used for Australia.)





**Figure 3.3.3: Selected common chronic conditions: hospitalisations (2015–16), deaths (2016) and burden of disease (DALY; 2011)**



*Notes*

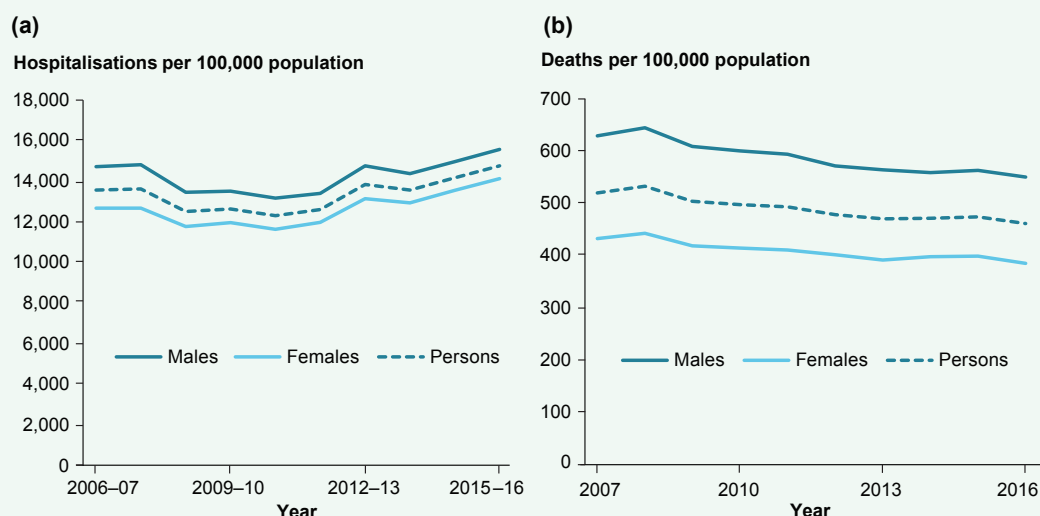
1. Each hospitalisation and death can involve more than one chronic condition; therefore, the sum of individual conditions is greater than the chronic condition total.
2. The category 'Other conditions' encompasses all conditions not listed as selected common chronic conditions and represents the proportion of hospitalisations or deaths that involve at least one of these 'Other conditions'. It is possible for a single hospitalisation or death to involve both chronic and 'Other conditions'; hence, the sum of 'Other conditions' and the chronic condition total exceeds 100.
3. Includes hospitalisations with the selected conditions recorded as either the principal or an additional diagnosis, and deaths with the selected conditions recorded as either the underlying or an associated cause of death.

*Sources:* National Hospital Morbidity Database 2015–16; National Mortality Database 2016; Australian Burden of Disease Study 2011; Table S3.3.3.

The burden of these conditions rests disproportionately with males and older Australians. Males were slightly more likely than females to be hospitalised with 1 of the selected 8 chronic conditions; at least 1 of those conditions was recorded in 39% of all male hospitalisations compared with 35% of all female hospitalisations. There was no substantial sex difference in the proportion of deaths involving chronic conditions in 2016, accounting for 87% of male and 86% of female deaths in that year.

When the influence of age is considered, the rate of hospitalisation and death from these conditions was consistently higher among males over time; however, the difference in rates between the sexes fell slightly (Figure 3.3.4). The rate of hospitalisations for chronic conditions gradually fell from being 16% higher among males than females in 2006–07 to 10% higher in 2015–16. There was a smaller general decrease in the difference in mortality rates between the sexes over time: males were 45% more likely than females to die from chronic conditions in 2007 and 43% more likely in 2016.

**Figure 3.3.4: Trends in selected chronic conditions: (a) hospitalisations (2006–07 to 2015–16) and (b) mortality (2007 to 2016), by sex**



*Notes*

1. Includes hospitalisations with the selected conditions recorded as either the principal or an additional diagnosis, and deaths with the selected conditions recorded as either the underlying or an associated cause of death.

2. 'Selected' chronic conditions include the 8 common conditions defined in Box 3.3.1.

Source: National Hospital Morbidity Database 2015–16; National Mortality Database 2016; Table S3.3.4.

The proportion of hospitalisations and deaths that involved at least 1 of the selected 8 chronic conditions generally rose as age increased: from less than 10% of hospitalisations and deaths among children aged 0–4, to 56% of hospitalisations and 87% of deaths among people aged 85 and over.

While older Australians experience the greatest burden of these chronic conditions, younger Australians are also affected. Around 3 in 4 (70%) hospitalisations for chronic conditions and 1 in 3 deaths (33%) occurred among people aged under 75. The proportion of deaths from chronic conditions of people aged under 75 (known as 'premature' deaths) was higher for males (39%) than for females (26%). There was no change in the proportion of premature deaths, or the difference between sexes, over time.

## What could this mean for an individual?

Chronic conditions are so common that most people are affected in some way, either by having a condition themselves or knowing someone who does.

Many chronic conditions share common risk factors that are largely preventable or treatable; for example, tobacco smoking, physical inactivity, overweight and obesity, unhealthy diets and high blood pressure. Preventing or modifying these risk factors can reduce the risk of developing a chronic condition and result in large population and individual health gains by reducing illness and rates of death (see Chapter 4).

Many of these risk factors are common to several chronic conditions, and this can mean an increase in the proportion of people who have more than one of these conditions. These people are generally more frequent users of the health care system and require more complex interventions and treatment to manage their conditions.

Beyond the population impact in terms of economic and disease burden, chronic conditions have a major impact on the individual and their social and support networks in terms of quality of life, disability, productivity and participation. Based on unadjusted self-reported data from the 2014–15 National Health Survey—and compared with the total Australian population—people with at least 1 of the 8 selected long-term conditions had generally lower labour force participation (24–49%, compared with 52%) and generally higher rates of:

- disability, restriction or limitation (32–63% compared with 19%)
- high or very high psychological distress (17–40% compared with 12%)
- bodily pain experienced in the previous 4 weeks (78–89% compared with 68%)
- fair or poor health (24–46% compared with 15%) (ABS 2015).

Due to these impacts on the individual, it is important that people with chronic conditions receive high-quality and coordinated care (taking into account risk factors and comorbidities) and are actively engaged with their treatment and management plan, leading to better health outcomes (AHMAC 2017).

## What is Australia doing to combat chronic conditions?

### Global initiatives

Australia contributes to several global initiatives for the prevention and management of chronic conditions. The *Global Action Plan for the Prevention and Control of NCDs, 2013–2020* provides countries with a selection of policy options and related goals to work towards in achieving nine voluntary global targets relating to non-communicable diseases; these targets include a 25% reduction in premature mortality from cardiovascular disease, cancer, diabetes or chronic respiratory conditions by the year 2025 (WHO 2013). At a broader level, the United Nations' Sustainable Development Goals include those to ensure good health and wellbeing by reducing premature mortality from non-communicable disease by one-third by 2030 (UN 2015).

## National initiatives

The growing prevalence of chronic conditions among Australia's population, coupled with a reduction in the death rate from these diseases, is increasing the pressure on the health care system. As people are living longer, often with more than 1 chronic condition, they require treatment and management for longer periods of time. This increases the need for emergency department visits, admitted patient hospital admissions, out-of-hospital services, medicines and palliative care.

Nationally, there are various programs to promote healthy lifestyles. These include a range of tobacco control measures, strategies to reduce harmful levels of alcohol consumption, and actions for the early detection of cancer and other chronic conditions (see Chapter 7.1 'Health promotion').

Community management of care for chronic conditions is primarily provided by general practitioners. Around 1 in 3 (35%) health problems managed by general practitioners was chronic in 2015–16 (Britt et al. 2016). With the aim of improving coordination of care for people with chronic conditions, the Australian Government has implemented a range of approaches including:

- access to care plans and assessments through the Medicare Benefits Schedule for the planning and management of chronic conditions
- subsidies through the Pharmaceutical Benefits Scheme for a range of medicines used in the treatment of chronic conditions
- introduction of Health Care Homes where patients are enrolled with a specific general practice or Aboriginal Community Controlled Health Service to coordinate their care and to facilitate services by a care team, which can include a range of health professionals (for example, general practitioner, specialists, allied health professionals, practice nurses) (Department of Health 2017).

See chapters 7.5 'Primary health care', 7.18 'Coordination of health care' for information about how patients use general practitioner services in Australia.

Recognising how chronic conditions and the increasing impact of multimorbidity are interrelated, in 2017, all Australian health ministers endorsed the National Strategic Framework for Chronic Conditions (the Framework). The Framework provides guidance for the development and implementation of policies, strategies, actions and services to tackle chronic conditions. The Framework addresses primary, secondary and tertiary prevention of chronic conditions, recognising that there are often similar underlying principles for the prevention and management of many chronic conditions. It moves away from a disease-specific approach and better caters for shared health determinants, risk factors and multimorbidities across a broad range of chronic conditions.

The Framework outlines three objectives that focus on preventing chronic conditions, providing efficient, effective and appropriate care to manage them and targeting priority populations (AHMAC 2017).

## What is the AIHW doing?

The AIHW has a long history of monitoring and reporting on chronic conditions, risk factors and health outcomes among the Australian population. In 2016, the National Centre for Monitoring Chronic Conditions (NCMCC) was formed in response to the need for a more streamlined, integrated and prioritised approach for reporting on chronic conditions. The NCMCC integrates holistic reporting on chronic conditions comorbidity and risk factors with disease-specific monitoring to provide a 'bigger picture' of chronic conditions in Australia. In so doing, it brings together work programs on:

- cardiovascular diseases, diabetes and chronic kidney disease
- chronic respiratory conditions
- chronic musculoskeletal conditions.

This work is complemented by ongoing work to update and extend the Australian Burden of Disease Study (see Chapter 3.1 'Burden of disease across the life stages'; Chapter 4.4 'Contribution of selected risk factors to burden of disease') and reporting on:

- the use of health services among people with chronic conditions (for example, potentially preventable hospital admissions and mental health services)
- disparities in specific population groups (for example, prisoners and Aboriginal and Torres Strait Islander Australians)
- disease expenditure.

## What is missing from the picture?

Better information on the number of people newly diagnosed and currently living with chronic conditions, such as dementia, osteoporosis and degenerative eye diseases, could benefit future health services planning.

Additional data on the treatment, management and impact of chronic conditions—including in respect to primary care, proper use of medicines, quality of life, and participation in work and education—will contribute to a more complete picture of the individual impact of chronic conditions in Australia and the effectiveness of current strategies to prevent and manage these conditions.

A number of national data sets contain information on chronic conditions. Data linkage can improve the understanding of patient outcomes, disease interactions and pathways through the health system.

## Where do I go for more information?

More information on chronic conditions is available on the AIHW website at <[www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/chronic-disease/overview](http://www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/chronic-disease/overview)>.

More information on burden of disease in Australia is available on the AIHW website at <[www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/burden-of-disease/overview](http://www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/burden-of-disease/overview)>.

Summary information on chronic condition comorbidity can be found in Chapter 3.3 of *Australia's health 2016*, available on the AIHW website at <[www.aihw.gov.au/reports-australias-health/australias-health-2016/contents/chapter-3-leading-causes-of-ill-health](http://www.aihw.gov.au/reports-australias-health/australias-health-2016/contents/chapter-3-leading-causes-of-ill-health)>.

## References

- ABS (Australian Bureau of Statistics) 2015. National Health Survey: first results 2014–15. ABS cat. no. 4364.0.55.001. Canberra: ABS.
- AHMAC (Australian Health Ministers' Advisory Council) 2017. National Strategic Framework for Chronic Conditions. Canberra: Department of Health. Viewed 22 February 2017, <<http://www.health.gov.au/internet/main/publishing.nsf/content/nsfcc>>.
- Britt H, Miller GC, Henderson J, Bayram C, Harrison C, Valenti L et al. 2016. General practice activity in Australia 2015–16. General practice series no. 40. Sydney: Sydney University Press.
- Department of Health 2017. Health care homes. Canberra: Department of Health. Viewed 20 December 2017, <<http://www.health.gov.au/internet/main/publishing.nsf/Content/health-care-homes>>.
- GBD (Global Burden of Disease) Collaborative Network 2017. Global Burden of Disease Study 2016 (GBD 2016) results. Seattle: Institute for Health Metrics and Evaluation (IHME). Viewed 27 November 2017, <<http://ghdx.healthdata.org/gbd-results-tool>>.
- UN (United Nations) 2015. Transforming our world: the 2030 Agenda for Sustainable Development. New York: UN. Viewed on 22 November 2017, <<https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf>>.
- WHO (World Health Organization) 2013. Global action plan for the prevention and control of noncommunicable diseases 2013–2020. Geneva: WHO. Viewed 22 November 2017, <[http://apps.who.int/iris/bitstream/10665/94384/1/9789241506236\\_eng.pdf?ua=1](http://apps.who.int/iris/bitstream/10665/94384/1/9789241506236_eng.pdf?ua=1)>.
- WHO 2017a. Noncommunicable diseases. Geneva: WHO. Viewed 22 November 2017, <<http://www.who.int/mediacentre/factsheets/fs355/en/>>.
- WHO 2017b. World health statistics 2017: monitoring health for the SDGs. Geneva: WHO.

## 3.4 Cancer

Cancer is a diverse group of several hundred diseases where some of the body's cells become abnormal and begin to multiply out of control. In 2011, cancer (as a disease group) was the greatest cause of disease burden in Australia, accounting for around one-fifth (19%) of the total disease burden.

Cancer is a notifiable disease in all Australian states and territories. The Australian Cancer Database holds data on all new cases of cancer diagnosed in Australia since 1 January 1982. Common non-melanoma skin cancers, including basal cell carcinoma and squamous cell carcinoma are not reportable to cancer registries. So, incidence and survival data presented for all cancers combined do not include these cancers.

This snapshot presents cancer incidence and mortality estimates for 2018. The estimates are a mathematical extrapolation of past trends.

### How common is cancer?

#### Incidence

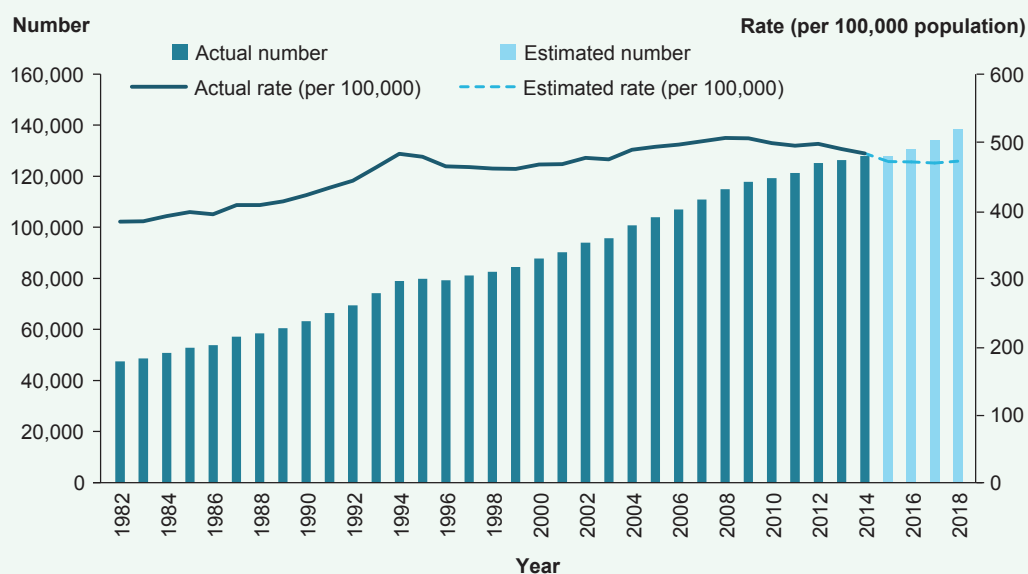
In 2018, it is estimated that:

- about 138,300 new cases of cancer will be diagnosed in Australia, an average of about 380 people every day—more than half (54%) of these cases will be diagnosed in males
- the risk of being diagnosed with any cancer before the age of 85 will be 1 in 2 for males and females
- the most commonly diagnosed cancers in males will be prostate cancer (17,700 cases), colorectal cancer (9,300), melanoma of the skin (8,700) and lung cancer (7,200)
- the most commonly diagnosed cancers in females will be breast cancer (18,100 cases), colorectal cancer (7,700), melanoma of the skin (5,700) and lung cancer (5,500).

The age-standardised incidence rate of all cancers combined rose from 383 per 100,000 population in 1982 to a peak of 504 per 100,000 in 2008, before decreasing to 484 per 100,000 in 2014. It is projected to continue to fall to 472 per 100,000 in 2018 (Figure 3.4.1). The increasing trend to 2008 was largely due to a rise in the number of diagnosed prostate cancers in males and breast cancers in females. This trend may have been the result of increased formal and informal population screening, and improvements in technologies and techniques used to identify and diagnose cancer.



Figure 3.4.1: Trends in incidence of all cancers combined, 1982–2018



## Notes

1. Cancers coded in the International Statistical Classification of Diseases and Related Health Problems, tenth revision (ICD-10) as C00–C97, D45, D46, D47.1 and D47.3, except those C44 codes that indicate basal or squamous cell carcinoma of the skin.
2. The 2015–2018 estimates presented in blue bars and the blue dotted line are based on 2002–2013 incidence data.
3. The rates were age standardised to the Australian population as at 30 June 2001 and are expressed per 100,000 population.

Source: Australian Cancer Database 2014; Table S3.4.1.

## Cancer incidence by stage at diagnosis

In 2015, the AIHW, Cancer Australia and state and territory cancer registries committed to work together to produce national population-level data on incidence by cancer stage at diagnosis for the first time for breast, prostate, colorectal and lung cancers and melanoma of the skin. These cancers were selected as they account for the most number of cancers diagnosed. Cancers can be assigned a 'stage' that reflects the seriousness of the disease. Stages range from 1 (best prognosis) to 4 (worst prognosis).

Collection and analysis of cancer staging data will enhance understanding of the variability in the cancer stage at the time of diagnosis and how this relates to treatments received and to survival rates.

In 2011:

- most cancers were diagnosed at stage 1, with melanoma of the skin having the highest percentage diagnosed at stage 1 (78%)
- 12% of people diagnosed with 1 of the 5 most commonly diagnosed cancers presented with a stage 4 cancer—stage 4 cancer accounted for 42% of lung cancers diagnosed, which was the highest percentage of the 5 most common cancers
- the percentage of Aboriginal and Torres Strait Islander people who were diagnosed with stage 4 cancer was generally higher than for non-Indigenous Australians (except for prostate cancer).



# Impact

## Survival

Information on survival from cancer indicates a cancer prognosis and the effectiveness of treatment available. Relative survival of less than 100% means that people with cancer had a lower chance of surviving for at least 5 years after diagnosis than the general population.

In 2010–2014 in Australia:

- individuals diagnosed with cancer had, on average, a lower (69%) chance of surviving for at least 5 years after diagnosis compared with their counterparts in the general population (referred to as '5-year relative survival', see Glossary)
- among people who had already survived 5 years past their cancer diagnosis, the chance of surviving for at least another 5 years was 91%
- for males, 5-year relative survival was highest for testicular cancer (98%) and prostate cancer (95%) and lowest for mesothelioma (5.8%) and pancreatic cancer (9.1%)
- for females, 5-year relative survival was highest for thyroid cancer (98%) and lip cancer (97%) and lowest for mesothelioma (9.7%) and pancreatic cancer (9.2%)
- Between 1985–1989 and 2010–2014, 5-year relative survival for all cancers combined rose from 49% to 69%.

## Deaths

It is estimated that, in 2018, around 48,600 people will die from cancer, an average of around 133 deaths every day. Males will account for more than half (57%) of these deaths.

It is estimated that between 1982 and 2018, the age-standardised mortality rate for all cancers combined will drop by around 24% from 209 deaths per 100,000 population to 159 deaths per 100,000.

## What is missing from the picture?

There are no national registry data on the stage (severity) of cancer at diagnosis except for breast, prostate, colorectal and lung cancers and melanoma of the skin, and these data are currently available for 2011 only. Information is also not readily available on the treatments applied to individual cases of cancer, the frequency of recurrence of cancer after treatment, or the incidence of common non-melanoma skin cancers (basal cell carcinomas and squamous cell carcinomas).

## Where do I go for more information?

The reports *Cancer in Australia: an overview, 2017*, *Australian Cancer Incidence and Mortality (ACIM) books 2017*, *Cancer incidence projections: Australia 2011 to 2020*, *Cancer survival and prevalence in Australia: period estimates from 1982 to 2010*, and *Cancer mortality trends and projections: 2013 to 2025* are available for free download.

## 3.5 Mesothelioma

Mesothelioma is an aggressive form of cancer in the mesothelium—the protective lining of the body cavities and internal organs, such as the lungs, heart and bowel. There is no known cure for it and the average time between diagnosis and death is 9 months (AMR 2017).

In 2010–2014, mesothelioma had the lowest 5-year relative survival of all cancer types, at 6.4%. This means that people diagnosed with mesothelioma had a 6.4% chance of surviving for at least 5 years compared with their counterparts in the general population (Australian Cancer Database 2014).

The main cause of mesothelioma is exposure to asbestos, with symptoms usually taking 20–30 years after first exposure to appear (AMR 2017). The term 'asbestos' refers to a group of naturally occurring fibrous minerals that do not readily break down. Mesothelioma is of particular relevance in Australia, where asbestos use was widespread from the 1950s to the 1980s (MacFarlane et al. 2012). Due to its durability and fire and chemical resistance, asbestos was used extensively in construction, including residential homes, as well as for other purposes such as industrial plants and equipment. In December 2003, the import and use of all forms of asbestos was prohibited, yet there is still a large amount of it in buildings and in other products used today (AMR 2017).

The latest information and detailed data on mesothelioma in Australia are available in *Mesothelioma in Australia 2016: 6th annual report* (AMR 2017). Key findings from this report are included in this snapshot. Data are sourced from the Australian Mesothelioma Registry (AMR 2017) (Box 3.5.1).

### Box 3.5.1: Australian Mesothelioma Registry (AMR)

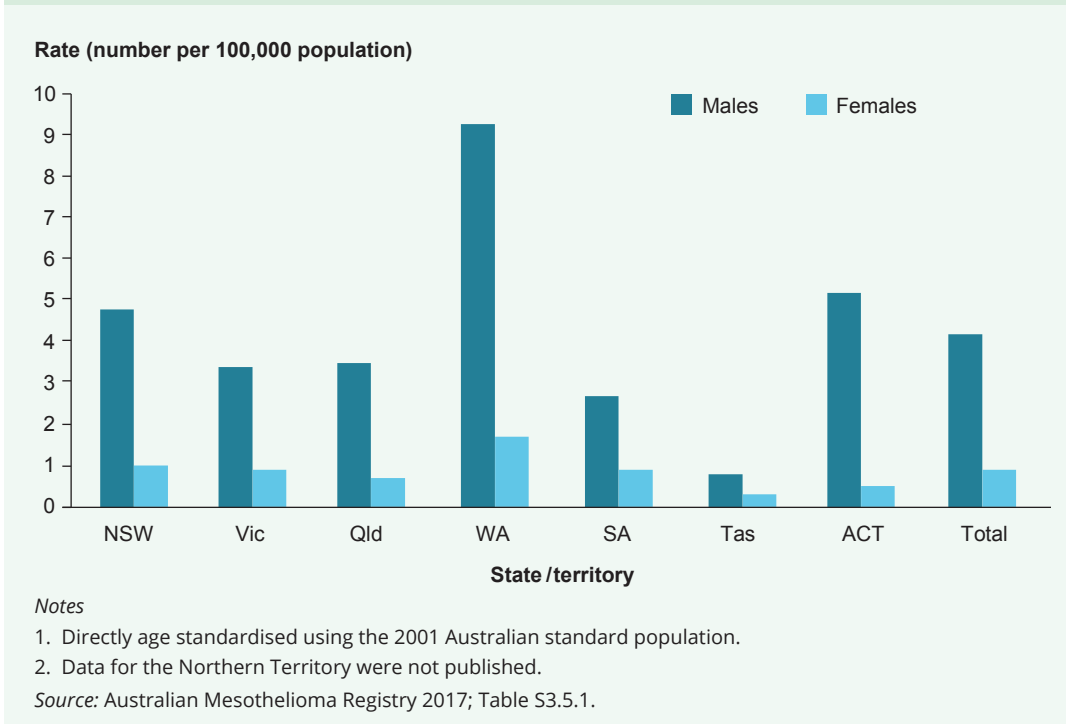
The AMR is a national registry of information specific to mesothelioma and asbestos exposure. It aims to better understand the relationship between asbestos exposure and this disease. Since 2011, it has collected information on new cases of mesothelioma diagnosed in Australia from 1 July 2010, fast-tracked by the state and territory cancer registries. The AMR also collects information on asbestos exposure from consenting mesothelioma patients through a postal questionnaire and telephone interview.

## How common is mesothelioma?

Australia has one of the highest rates of mesothelioma incidence in the world. The rate of new cases of mesothelioma recorded by the AMR has showed little change since the AMR data collection began in 2011, with the highest rate of 2.9 per 100,000 population recorded in 2012.

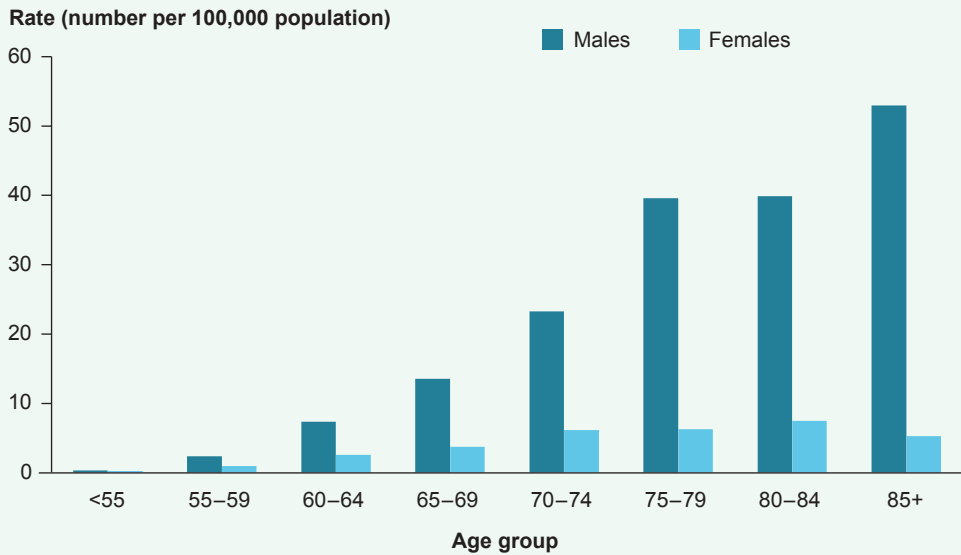
In 2016, the AMR was notified of 700 people newly diagnosed with mesothelioma in Australia; the incidence of the disease that year varied by state and territory (Figure 3.5.1). Mesothelioma is more common in men than women, accounting for around 4 in 5 (81%) cases. This is likely due to men more often working in industries at risk of asbestos exposure (such as construction trades) and completing non-paid home renovations. Rates were highest in Western Australia, where the rate for men was more than double the national rate. Exposure to asbestos has been responsible for many cases of mesothelioma in the Western Australian town of Wittenoom, well known for past mining of asbestos (Franklin et al. 2016).

**Figure 3.5.1: Incidence rate of mesothelioma, by sex and state and territory, 2016**



In 2016, age at diagnosis ranged from 21 to 95. Age-specific rates of mesothelioma generally increased with age, with the highest rate for people aged 85 and over. For men, the rate was highest for people aged 85 and over, at 53 per 100,000 population. For women, the rate was highest for people aged 80–84, at 7.4 per 100,000 population (Figure 3.5.2).

Figure 3.5.2: Age-specific incidence rate of mesothelioma, by age group and sex, 2016



Note: Age-specific rate using the Australian estimated resident population as at 30 June 2016.

Source: Australian Mesothelioma Registry 2017; Table S3.5.2.

## Impact

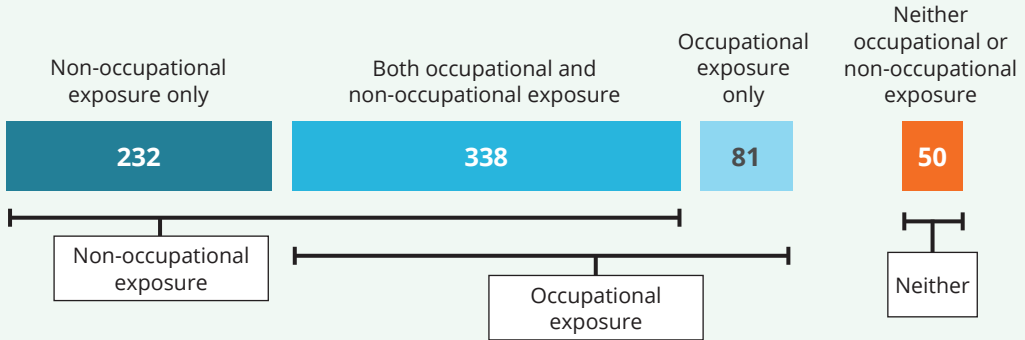
575 mesothelioma patients were recorded by the AMR as having died in 2016, at a rate of 2.0 per 100,000 population—84% of these deaths were of men. The mortality rate was highest in Western Australia, at 3.9 per 100,000 population.

Cause of death information was available for 260 (45%) deaths recorded by the AMR in 2016. Where cause of death was recorded, mesothelioma was the underlying primary cause of death for 235 cases (90%).

## Asbestos exposure

As at 3 April 2017, 701 participants had completed both the voluntary questionnaire and telephone interview components of the assessment since the start of the AMR. Of these people, 651 (93%) provided information indicating possible or probable asbestos exposure. For the remaining 50 participants (7.1%), the exposure assessment did not produce information indicating asbestos exposure in either occupational or non-occupational contexts (Figure 3.5.3). This should not be taken, however, to mean that these participants were never exposed to asbestos.

**Figure 3.5.3: Summary of occupational and non-occupational asbestos exposure assessment, 2011–2016**



Source: Australian Mesothelioma Registry 2017; Table S3.5.3.

A total of 570 participants were identified as having possible or probable non-occupational exposure. Based on information provided, 363 participants reported having done major home renovations that involved asbestos products. Other common potential exposures included living in a house while renovations were occurring, and servicing car brakes and/or clutches.

Based on jobs held during their working career, 491 participants were identified as having possible or probable occupational exposure. Most of these people had a history of working in trades, such as in the construction or metal industries or as an electrician, plumber or mechanic. Almost 9 in 10 (87%) participants with a trade history were classified as having possible or probable exposure.

### What is missing from the picture?

Data on mesothelioma notifications are fast-tracked to the AMR by state and territory cancer registries. The incidence and mortality data presented in this snapshot are likely to be an underestimate, as it is probable that not all notifications for 2016 were recorded in the AMR data set when the annual report was published. The AMR data set is regularly updated back to 1 July 2010.

The participation rate in the voluntary components of the AMR is low, with only around 20% of patients diagnosed with mesothelioma taking part. This is partially due to patients dying or being too unwell to participate. Given this low participation rate, it is currently unknown how representative exposure information is. As well, the results of the asbestos exposure assessments consider only the probability of asbestos exposure. Information about the duration, intensity or frequency of exposure has not been reported.

## Where do I go for more information?

More information on the AMR is available at <[www.mesothelioma-australia.com/home](http://www.mesothelioma-australia.com/home)>.

The report *Mesothelioma in Australia 2016: 6th annual report* and previous annual reports are available for free download at <[www.mesothelioma-australia.com/publications-and-data/publications](http://www.mesothelioma-australia.com/publications-and-data/publications)>.

People diagnosed with mesothelioma can choose to self-notify their diagnosis by contacting the AMR via email at [amr@aihw.gov.au](mailto:amr@aihw.gov.au) or on the toll-free AMR information line 1800 378 861.

## References

AMR (Australian Mesothelioma Registry) 2017. Mesothelioma in Australia 2016: 6th annual report. NSW Health: Cancer Institute NSW. Viewed 25 October 2017, <<https://www.mesothelioma-australia.com/publications-and-data/publications>>.

Franklin P, Reid A, Olsen N, Peters S, de Klerk N, Brims F et al. 2016. Incidence of malignant mesothelioma in Aboriginal people in Western Australia. *Australian and New Zealand Journal of Public Health* 40:383–7.

MacFarlane E, Benke G, Sim MR & Fritschi L 2012. OccIDEAS: an innovative tool to assess past asbestos exposure in the Australian Mesothelioma Registry. *Safety and Health at Work (SH@W)* 3:71–6.

## 3.6 Coronary heart disease

Coronary heart disease (CHD) is the leading single cause of disease burden and death in Australia. It occurs when there is a blockage in the blood vessels that supply blood to the heart muscle. There are two major clinical forms—heart attack and angina (see Glossary).

CHD is largely preventable, as many of its risk factors are modifiable. These include tobacco smoking, high blood pressure, high blood cholesterol, physical inactivity, poor nutrition, and overweight and obesity (see Chapter 4 for more information on determinants of health).

### How common is coronary heart disease?

In 2014–15, an estimated 645,000 Australians aged 18 and over (3.3% of the adult population) had CHD, based on self-reported estimates from the Australian Bureau of Statistics 2014–15 National Health Survey. The prevalence of CHD increases rapidly with age, affecting around 1 in 6 adults aged 75 and over.

In 2015, based on hospital and mortality data, an estimated 61,600 people aged 25 and over had an acute coronary event in the form of a heart attack or unstable angina—around 170 events every day.

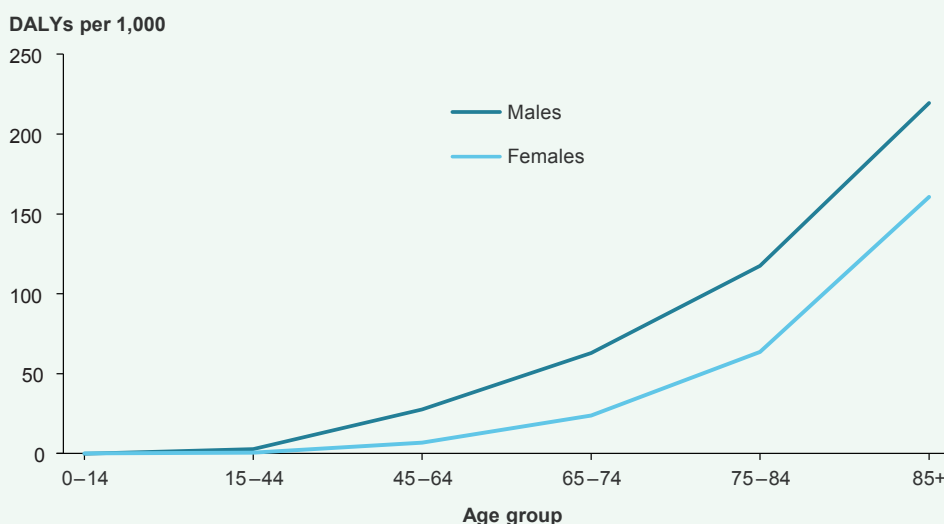
### Impact

#### Burden of disease

In 2011, CHD accounted for 7.7% of the total burden of disease in Australia. It accounted for 12% of the overall fatal burden of disease and 3.2% of the non-fatal burden.

The burden was more than twice as high in males than females and increased rapidly from age 45 onwards—to 17% among people aged 85 and over (Figure 3.6.1).

**Figure 3.6.1: Rate of total burden due to CHD, by age and sex, 2011**



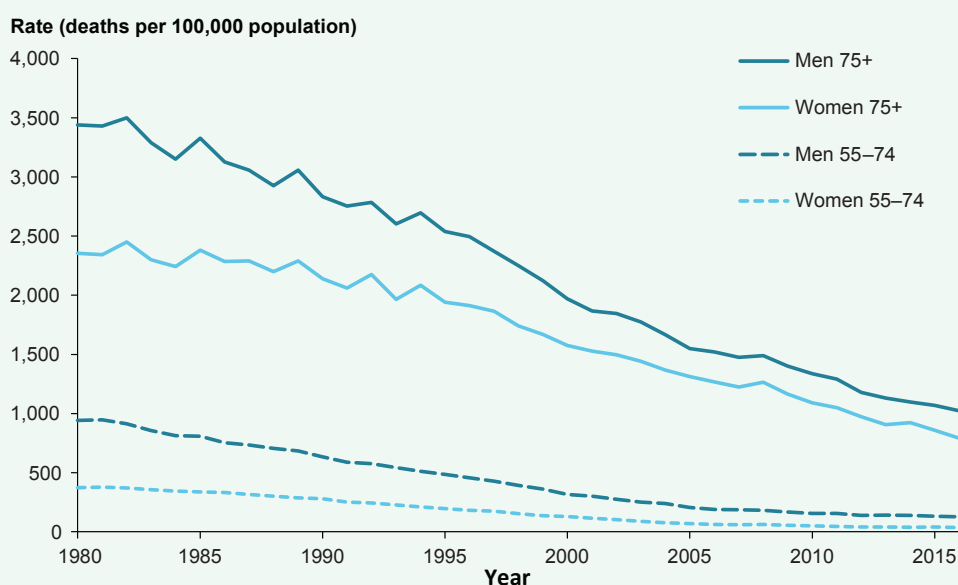
Source: AIHW 2016; Table S3.6.1.

CHD burden can be attributed to several risk factors. In 2011, high blood pressure was responsible for the most CHD burden, estimated at 33%, followed by high cholesterol (28%), overweight and obesity (25%), tobacco use (14%) and physical inactivity (11%). Between 2003 and 2011, the overall burden from CHD reduced by 32%. This was driven largely by a 35% drop in the fatal burden of CHD. The non-fatal burden also fell by 21%.

## Deaths

In 2016, CHD was the leading single cause of death in Australia, accounting for 19,100 deaths as the underlying cause of death. This represents 12% of all deaths, and 43% of cardiovascular deaths. More than 40% (8,000) of CHD deaths resulted from a heart attack. Overall, the CHD death rate has fallen by 79% since 1980, or 4.3% per year. While CHD death rates fell substantially in each age group, the rate of decline was more rapid for those aged 75 and over than for younger age groups (Figure 3.6.2).

Figure 3.6.2: CHD death rates, people aged 55 and over, by age and sex, 1980–2016



Source: National Mortality Database. Table S3.6.2.

## Treatment and management

### Cardiovascular medicines

In 2015, more than 100 million Pharmaceutical Benefits Scheme prescriptions for cardiovascular medicines were dispensed to the Australian community—34% of the total prescription medicines dispensed.

The prescription medicines most commonly dispensed were those to lower blood pressure and to lower blood cholesterol. Dispensing of prescription lipid-modifying agents rose by 66% between 2005 and 2015, while dispensing of calcium channel blockers and renin-angiotensin system agents—both agents to lower blood pressure—increased by 41% and 38%, respectively.



## Hospitalisations

In 2015–16, there were 157,000 hospitalisations where CHD was the principal diagnosis (1.5% of all hospitalisations). Of these, 36% were for heart attack (56,000) and 28% for angina (44,500). Most admissions for heart attack (78%) and angina (63%) were emergency admissions.




Between 2003–04 and 2015–16, the age-standardised rate of hospitalisations declined by 29%, from 804 to 569 hospitalisations per 100,000 population.

CHD was the leading cause of hospitalisation for cardiovascular disease in 2015–16 (28% of all hospitalisations with a principal diagnosis of cardiovascular disease). However, for people aged 85 and over, hospitalisation rates for heart failure and cardiomyopathy were 50% higher than for CHD (5,000 and 3,200 hospitalisations per 100,000 population, respectively), reflecting the increasing need for hospital care for heart failure and cardiomyopathy among the elderly.

Of all CHD hospitalisations, 45% had a coronary angiography (a diagnostic procedure) and 24% underwent revascularisation (surgical procedures to restore blood supply to the heart).

## Variations among population groups

The impact of CHD varies among population groups, with rates being 2.0–3.1 times as high among Aboriginal and Torres Strait Islander people as among non-Indigenous Australians. Generally, the impact of CHD increases with increasing remoteness and socioeconomic disadvantage. Rates were 1.4–2.4 times as high in *Remote/Very remote* areas as in *Major cities*, and 1.3–2.2 times as high in the lowest socioeconomic areas compared with the highest.

Comparing rates for:	 Indigenous / non-Indigenous	 Remote and Very remote / Major cities	 Lowest / highest socioeconomic areas
Having CHD	2.0×	n.a.	2.2×
Hospitalised for CHD	2.4×	1.5×	1.3×
Dying from CHD	2.1×	1.4×	1.6×
Having an acute coronary event	2.7×	n.a.	n.a.
Burden of disease (DALYs)	3.1×	1.7x (Remote) / 2.4x (Very remote)	1.8×

n.a. not available

## What is missing from the picture?

There are no reliable national and jurisdictional data on the number of new cases of CHD or heart failure each year. Proxy measures that combine hospital and mortality data are used to estimate new cases of CHD; however, these methods do not count the less severe cases of CHD that do not result in hospitalisation.

Further information is needed on primary health care and on the long-term outcomes of people treated for CHD. Data linkage can improve the understanding of patient outcomes and pathways through the health system.

## Where do I go for more information?

More information on coronary heart disease is available at <[www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/heart-stroke-vascular-diseases/overview](http://www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/heart-stroke-vascular-diseases/overview)>.

The following reports are available for free download on the AIHW website: *Cardiovascular health compendium*, *Trends in cardiovascular deaths*, and *Medicines for cardiovascular disease*.

## 3.7 Stroke

Stroke occurs when a blood vessel supplying blood to the brain either suddenly becomes blocked (known as an ischaemic stroke) or ruptures and begins to bleed (known as a haemorrhagic stroke). Either may result in part of the brain dying, leading to sudden impairment that can affect a number of functions. Stroke often causes paralysis of parts of the body normally controlled by the area of the brain affected by the stroke, or speech problems and other symptoms, such as difficulties with swallowing, vision and thinking. Stroke is often preventable because many of its risk factors are modifiable. These include high blood pressure, physical inactivity, overweight and obesity, and tobacco smoking (see Chapter 4 for more information on determinants of health).

### How common is stroke?

In 2015, an estimated 394,000 people—199,000 males and 195,000 females—had had a stroke at some time in their lives, based on self-reported data from the Australian Bureau of Statistics 2015 Survey of Disability, Ageing and Carers (ABS 2016). The estimated prevalence of stroke (1.7% of Australians) has remained similar between 2003 and 2015. The proportion of people who had disability resulting from stroke also remained similar over the period (2003–2015), at around 40%.

In 2015, there were around 36,700 stroke events—around 100 every day. The rate of these events, based on hospital and mortality data, fell by 26% between 2000 and 2015, from an age-standardised rate of 176 to 130 per 100,000 population (Supplementary Table S3.7.1).

### Impact

#### Burden of disease

In 2011, stroke accounted for 3.0% of the total burden of disease in Australia and was the eighth leading specific cause of disease burden.

Stroke was the third highest disease burden in people aged 85 and over, accounting for 7.5% of the burden in men and 9.4% of the burden in women.

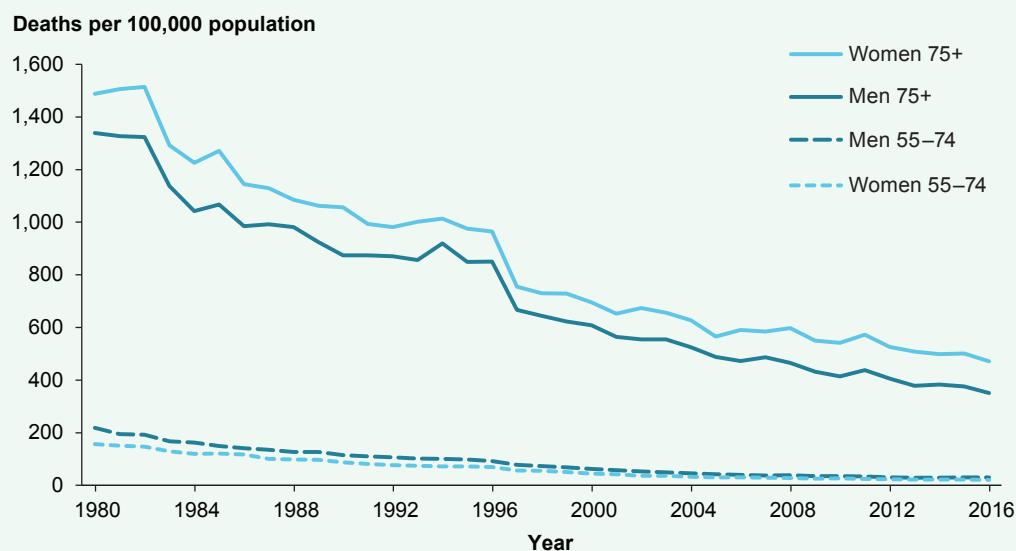
#### Deaths

In 2016, there were 8,200 deaths with stroke recorded as the underlying cause, accounting for 5.2% of all deaths in Australia.

Between 1980 and 2016, overall death rates for stroke have fallen by three-quarters (74%), or 3.7% per year (Supplementary Table S3.7.2).

The rate of decline has remained steady in people aged 75 and over but slowed among younger age groups (Figure 3.7.1).

Figure 3.7.1: Stroke death rates, people aged 55 and over, by age and sex, 1980–2016



Source: National Mortality Database; Table S3.7.3.

## Treatment and management of stroke




### Hospitalisations

In 2015–16, there were 37,300 acute care hospitalisations with a principal diagnosis of stroke (Supplementary Table S3.7.4), at a rate of 134 per 100,000 population. Hospitalisation rates were higher among males than females (1.4 times as high), and most hospitalisations (72%) were for people aged 65 and over (Supplementary Table S3.7.4).

The average length of stay for stroke patients in acute hospital care was 8 days in 2015–16. Stroke patients in rehabilitation care had an average length of stay of 26 days.

### Variation by population group

The impact of stroke varies among population groups, with rates being 1.5 to 2.3 times as high among Aboriginal and Torres Strait Islander people as among non-Indigenous Australians. Death rates and burden of disease were similar in *Remote and Very remote* areas compared with *Major cities*. Hospitalisation rates for stroke were 1.3 times higher in *Remote and Very remote* areas compared with *Major cities*. The impact of stroke was 1.2 to 1.4 times as high in the lowest socioeconomic areas compared with the highest.

Comparing rates for:			
	Indigenous / non-Indigenous	Remote and Very remote / Major cities	Lowest / highest socioeconomic areas
Being hospitalised for stroke	1.7x	1.3x	1.3x
Dying from stroke	1.5x	Similar	1.2x
Burden of disease (DALYs)	2.3x	Similar ( <i>Remote</i> ) / Similar ( <i>Very remote</i> )	1.4x

## What is missing from the picture?

Currently, there is no comprehensive national monitoring of new cases of stroke. Only stroke events that result in hospitalisation or death can be monitored, although this includes most strokes.

National data on stroke treatment and care responses such as time to treatment and medicine usage can further enhance stroke monitoring. Data linkage can also improve the understanding of patient outcomes and their pathways through the health system.

## Where do I go for more information?

More information on stroke is available at [www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/heart-stroke-vascular-diseases/overview](http://www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/heart-stroke-vascular-diseases/overview).

The following reports are available for free download on the AIHW website:

[Cardiovascular health compendium](#) and [Trends in cardiovascular deaths](#).

## References

ABS (Australian Bureau of Statistics) 2016. Microdata: Disability, Ageing and Carers, Australia, 2015. ABS cat. no. 4430.0.30.002. Canberra: ABS. AIHW analysis of Expanded Confidentialised Unit Record File, DataLab.

## 3.8 Diabetes

Diabetes is a chronic condition marked by high levels of sugar (glucose) in the blood. It is caused by the body's being unable to produce insulin (a hormone made by the pancreas to control blood glucose levels) or to use insulin effectively, or both.

The main types of diabetes are:

- type 1 diabetes—an autoimmune disease that usually has an onset in childhood or early adulthood
- type 2 diabetes—the most common form of diabetes, generally having a later onset. It is largely preventable and is often associated with lifestyle factors such as insufficient physical activity, unhealthy diet, obesity and tobacco smoking. Risk is also associated with genetic and family-related factors
- gestational diabetes—when higher than normal blood glucose is diagnosed for the first time during pregnancy.

The treatment of diabetes aims to maintain healthy blood glucose levels to prevent both short- and long-term complications, such as heart disease, kidney disease, blindness and lower limb amputation. All people with type 1 diabetes need insulin replacement therapy, as do a proportion of people with other forms of diabetes as their condition worsens over time.

### How common is diabetes?

Based on self-reported estimates from the Australian Bureau of Statistics 2014–15 National Health Survey, more than 1 in 20 (6.1%, or 1.2 million) Australian adults had diabetes. However, self-reported data are likely to underestimate diabetes prevalence. Analysis of measured diabetes data from 2011–12 showed that for every 4 adults with diagnosed diabetes there is 1 with undiagnosed diabetes.

An estimated 1 in 5 (19%) Australians aged 75 and over had diabetes in 2014–15, compared with 1.3% of people aged 18–44. Diabetes was also more common in males (6.8%) than females (5.4%).

The age-standardised rate of self-reported diabetes has more than tripled over 25 years—from 1.5% in 1989–90 to 4.7% in 2014–15.

## Impact

### Burden of disease

Diabetes was the 12th leading cause of disease burden in 2011, responsible for 2.3% of the total direct burden of disease and injury in Australia. If the health loss from both diabetes and other diseases for which diabetes is a risk factor is considered, the burden due to diabetes almost doubles.

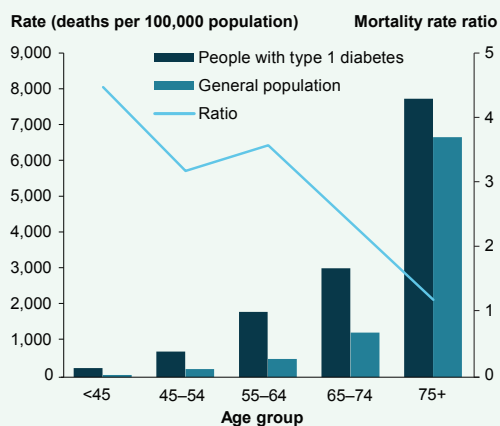
## Deaths

Diabetes was the underlying cause of around 4,770 deaths in 2016. However, it contributed to 16,450 deaths (10% of all deaths) (Supplementary Table S3.8.1).

An examination of deaths among people with diagnosed diabetes provides a more complete picture of diabetes-related deaths. Age-adjusted death rates for people with diabetes were almost double those for the general Australian population. The disparity in death rates was highest in people aged under 45 with type 1 diabetes (4.5 times as high), and type 2 diabetes (5.8 times as high) (figures 3.8.1 and 3.8.2).

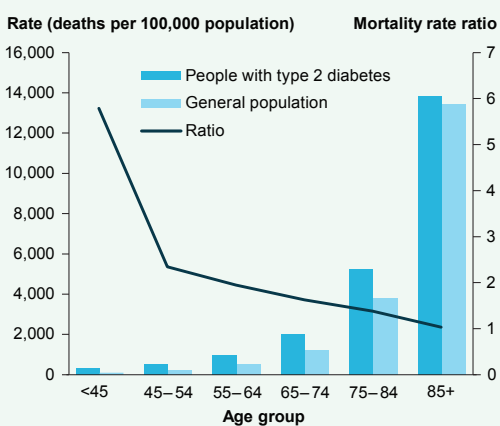
Between 2009 and 2014, death rates fell by 20% for people with type 1 diabetes but rose by 10% for people with type 2 diabetes. As death rates have been declining in the general population, the mortality gap has widened for people with type 2 diabetes but reduced for people with type 1 diabetes, compared with the general population.

**Figure 3.8.1: All-cause mortality rates for people with type 1 diabetes compared with general population, by age, 2012–2014**



Source: Table S3.8.2.

**Figure 3.8.2: All-cause mortality rates for people with type 2 diabetes compared with general population, by age, 2014**



Source: Table S3.8.3.

## Treatment and management

### Diabetes medicines




- In 2015, more than 11 million Pharmaceutical Benefits Scheme and Repatriation Pharmaceutical Benefits Scheme prescriptions for diabetes medicines were dispensed to the Australian community (Department of Health 2016).
- The most commonly dispensed prescription medicines for managing diabetes were metformin, sulfonylureas, DPP4 (dipeptidyl peptidase 4) inhibitors, and insulin. Metformin prescriptions made up almost half of all dispensed diabetes medicines; it was the ninth most dispensed medicine to the Australian community in 2015.
- In 2016, there were 27,700 people who began using insulin to treat their diabetes—9.5% with type 1 diabetes, 59% with type 2 diabetes, 29% with gestational diabetes and 1.9% with other forms of diabetes.

### Hospitalisations

Diabetes was recorded as the principal and/or additional diagnosis in around 1 million hospitalisations in 2015–16, accounting for 10% of all hospitalisations in Australia.

## Variations among population groups

The impact of diabetes varies among population groups, with rates being 3–6 times as high among Aboriginal and Torres Strait Islander people as among non-Indigenous Australians. Generally, the impact of diabetes increases with increasing remoteness and socioeconomic disadvantage. Rates were almost twice as high in *Remote/Very remote* areas compared with *Major cities*, and 2–3 times as high in the lowest socioeconomic areas compared with the highest.

Comparing rates for:	 Indigenous / non-Indigenous	 Remote and Very remote / Major cities	 Lowest / highest socioeconomic areas
Having diabetes	3.5×	Similar	2.6×
Hospitalised for type 2 diabetes	4.0×	2.0×	2.0×
Dying from diabetes	4.0×	1.8×	2.3×
Burden of disease (DALYs)	5.6×	2.3×	2.3×

### What is missing from the picture?

There are several data gaps for diabetes. Currently, there are no national data on the number of new cases of diagnosed type 2 diabetes and no regular collection of biomedical data to better understand diabetes prevalence.

There is limited national data to monitor complications associated with gestational diabetes and pre-existing diabetes in pregnancy. There is a need for national primary health care data on screening, self-care management, and appropriateness of care and health across the life course.

### Where do I go for more information?

More information on diabetes is available at [www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/diabetes/overview](http://www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/diabetes/overview).

The following reports are available for free download: *Incidence of insulin-treated diabetes in Australia*, *Deaths among people with diabetes in Australia, 2009–2014* and the Cardiovascular disease, diabetes and chronic kidney disease—Australian facts series (Mortality; Prevalence and incidence; Morbidity—hospital care; Risk factors; Aboriginal and Torres Strait Islander people).

### Reference

Department of Health 2016. Australian statistics on medicines 2015. Canberra: Department of Health. Viewed 5 December 2017, <[www.pbs.gov.au/info/browse/statistics#ASM](http://www.pbs.gov.au/info/browse/statistics#ASM)>.



## 3.9 Chronic kidney disease

The kidneys filter and remove waste from the blood. Kidney disease occurs when the nephrons (the functional units in the kidneys that filter blood) are damaged. Chronic kidney disease (CKD) is where evidence of kidney damage and/or reduced kidney function lasts at least 3 months. The most severe form of CKD is end-stage kidney disease (ESKD), for which people usually need kidney replacement therapy (KRT)—a kidney transplant or dialysis—to survive.

Many cases of CKD are preventable, as several of its risk factors—such as high blood pressure, insufficient physical activity, overweight and obesity, and tobacco smoking—are modifiable. Simple tests of a person's blood and urine can identify most cases of CKD when the disease is in its early stages, enabling treatment to prevent or slow its progression.

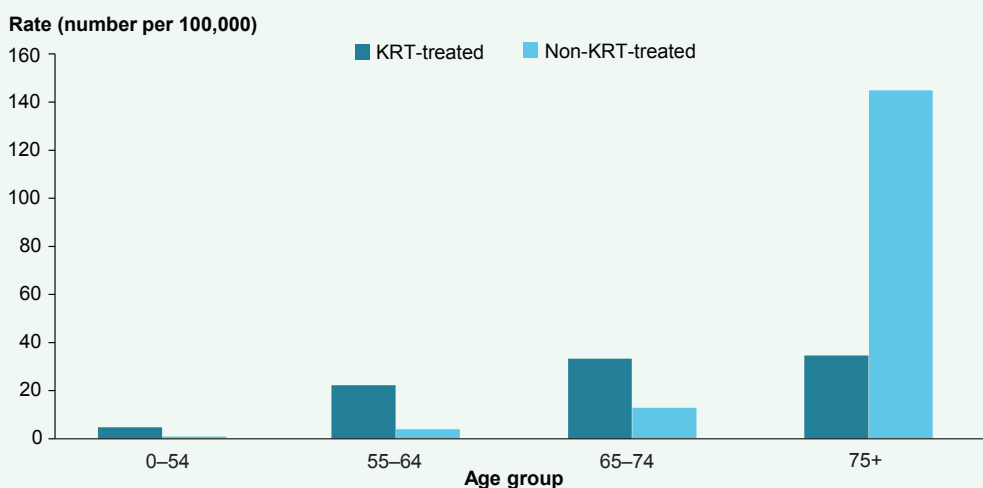
### How common is chronic kidney disease?

In 2011–12, an estimated 1 in 10 people (1.7 million Australians) aged 18 and over had biomedical signs of CKD. The risk of CKD increases rapidly with age, affecting around 2 in 5 (42%) people aged 75 and over.

There were around 5,100 new cases of ESKD in Australia in 2013, which equates to around 14 new cases per day. Of these, around 50% were receiving KRT.

The rate of new cases of KRT-treated and non-KRT-treated ESKD increased with age for all age groups up to age 74. From age 75, rates of non-KRT-treated ESKD rose rapidly—an 11-fold increase from ages 65–74 (from 13 to 145 per 100,000 population) (Figure 3.9.1).

**Figure 3.9.1: Incidence rate of ESKD, by age and treatment status, 2013**



Sources: AIHW analysis of linked Australia and New Zealand Dialysis and Transplant Registry, National Mortality Database and National Death Index; Table S3.9.1.

Between 1997 and 2013, the number of new cases of KRT-treated and non-KRT-treated ESKD increased by 71% and 35%, respectively. However, the rate for both treatment groups has remained relatively stable since 2001—an average of 10 per 100,000 population per year.

# Impact

## Burden of disease

In 2011, CKD was responsible for 0.9% of the total burden of disease and injury in Australia (see Chapter 4.4 'Contribution of selected risk factors to burden of disease' for definitions of burden of disease). The burden of CKD increased rapidly with age from ages 35–39, with CKD being the eighth leading cause of burden among people aged 85 and over.

CKD is also a risk factor for other diseases. In 2011, it was responsible for 19% of peripheral vascular disease burden, 8.4% of dementia burden and 7.2% of stroke burden. If the health loss from both CKD and other diseases for which CKD is a risk factor is considered, the burden due to CKD doubles.

## Deaths

CKD contributed to around 17,000 (11%, or 1 in 9) deaths in 2016, with 75% of these recording CKD as an associated cause of death. CKD is more often listed as an associated cause as the disease itself may not lead directly to death. When CKD was an associated cause of death, coronary heart disease (21%), heart failure and cardiomyopathy (7.4%), and dementia and Alzheimer disease (7.0%) were the most common underlying causes of death (Supplementary Table S3.9.3).

# Treatment and management

## Hospitalisations

In 2015–16, CKD was recorded as the principal and/or additional diagnosis in around 1.7 million hospitalisations—16% of all hospitalisations in Australia.

Of these, 81% (1.4 million) were for regular dialysis treatment, making dialysis the most common reason for hospitalisation in Australia. On average, dialysis patients attend 3 sessions per week. Age-standardised rates for dialysis have increased by 24% over the last decade, from 4,200 per 100,000 population in 2005–06 to 5,200 per 100,000 in 2015–16.




There were more than 300,000 hospitalisations for CKD excluding dialysis in 2015–16. Most (87%) had CKD as an additional diagnosis. Age-standardised rates have increased by 22%, from 138 per 100,000 population in 2005–06 to 169 per 100,000 in 2015–16.

## Kidney replacement therapy

In 2015, around 23,000 people received KRT. Of these, 54% had dialysis while 46% had a kidney transplant. The number of people receiving KRT has more than doubled in the last 2 decades, from around 9,300 to 23,000 (ANZDATA 2016).

# Variations among population groups

The impact of CKD varies among population groups, with rates being 2.1–7.3 times as high among Aboriginal and Torres Strait Islander people as among non-Indigenous Australians and 1.8–2.3 times as high in *Remote/Very remote* areas compared with *Major cities*. Generally, the impact of CKD increases with increasing socioeconomic disadvantage. Rates were 1.6–2.0 times as high in the lowest socioeconomic areas compared with the highest.

Comparing rates for:	 Indigenous / non-Indigenous	 Remote and Very remote / Major cities	 Lowest / highest socioeconomic areas
	Having CKD	2.1×	n.a.
Hospitalised for CKD (excluding dialysis)	5.0×	2.3×	1.9×
Dying from CKD	3.7×	1.8×	1.7×
Burden of disease (DALYs)	7.3×	n.a.	2.0×

n.a. not available

## What is missing from the picture?

Currently, there are only two surveys that provide reliable national data on biomedical signs of CKD. Regular data collection would allow for more timely prevalence estimates and the reporting of trends. Further, while there are national data on new cases of ESKD, there are no national data on new cases of CKD.

## Where do I go for more information?

More information on CKD is available at <[www.aihw.gov.au/reports/chronic-kidney-disease/chronic-kidney-disease-compendium/contents/how-many-australians-have-chronic-kidney-disease](http://www.aihw.gov.au/reports/chronic-kidney-disease/chronic-kidney-disease-compendium/contents/how-many-australians-have-chronic-kidney-disease)>.

Find interactive maps on *Geographical variation in chronic kidney disease*.

These reports on CKD can be downloaded for free: *Incidence of end-stage kidney disease in Australia 1997–2013* and the *Cardiovascular disease, diabetes and chronic kidney disease—Australian facts* series (*Mortality; Prevalence and incidence; Morbidity—hospital care; Risk factors; Indigenous Australians*).

## Reference

ANZDATA (Australian and New Zealand Dialysis and Transplant Registry) 2016. *ANZDATA 39th annual report 2016*. Adelaide: ANZDATA.

## 3.10 Arthritis and other musculoskeletal conditions

Arthritis and other musculoskeletal conditions are a group of conditions affecting the bones, muscles and joints. These conditions include osteoarthritis, rheumatoid arthritis, juvenile arthritis, back pain and problems, gout, and osteoporosis or osteopenia (low bone density) (see Glossary).

### How common are arthritis and other musculoskeletal conditions?

Arthritis and other musculoskeletal conditions are very common, affecting around 1 in 3 (30%) Australians. Self-reported data from the Australian Bureau of Statistics 2014–15 National Health Survey indicates that, of the nearly 6.9 million people (30% of the total population) with arthritis and other musculoskeletal conditions, 3.7 million (16%) had back pain and problems (the most common musculoskeletal condition), 3.5 million (15%) had arthritis and 801,000 (3.5%) had osteoporosis (ABS 2015). Females and older people were more likely to have arthritis and other musculoskeletal conditions:

- More than half (55%) of all people with musculoskeletal conditions were female.
- Compared with males, in each age group, females had a similar prevalence of back pain and problems and were 20–50% more likely to have arthritis.
- Overall, females were around 4 times as likely as males to have osteoporosis, but there was substantial variation by age.
- More than half (53%) of all people with musculoskeletal conditions were aged 55 and over.
- One in 4 (26%) Australians aged 55 and over had back pain and problems, 44% had arthritis and 11% had osteoporosis.

People with arthritis and other musculoskeletal conditions often have other chronic and long-term conditions. This is referred to as 'comorbidity', where two or more health problems occur at the same time.

In 2014–15, for people with:

**arthritis**, 79% had at least one other chronic condition

**back pain and problems**, 65% had at least one other chronic condition.

	Arthritis + other chronic condition(s)	Arthritis only
Arthritis + other chronic condition(s)	79%	21%
Back pain and problems + other chronic condition(s)	65%	35%

The proportion of people with comorbidities increased with age: from 74% (aged 45–64) to 86% (aged 65 and over) for people with arthritis and from 49% (aged 0–44) to 89% (aged 65 and over) for people with back pain and problems.

# Impact

Arthritis and other musculoskeletal conditions are large contributors to illness, pain and disability. Individuals with these conditions have higher rates of poor health, psychological distress and reduced participation in work and education. In 2015, of the people with disability in Australia, 14% had back problems and 13% had arthritis as the main long-term health condition causing the disability (ABS 2016).

According to the Australian Burden of Disease Study 2011, musculoskeletal conditions contributed to:

- 12% of the total disease burden (fatal and non-fatal) in Australia. This disease group was the fourth leading contributor to total burden after cancer, cardiovascular disease, and mental and substance use disorders
- almost one-quarter (23%) of non-fatal burden (that is, the impact of living with illness and injury)
- a higher burden among females than males—females experienced more than half (55%) of the burden due to all musculoskeletal conditions combined, and two-thirds (66%) of the burden due to osteoarthritis. Males experienced most of the burden due to gout (83%).

Some of the total burden due to musculoskeletal conditions can be attributed to preventable risk factors. In 2011:



## Overweight and obesity

contributed to:

**10%** of total burden of all musculoskeletal conditions

**45%** of the burden of osteoarthritis

**39%** of the burden of gout



## Occupational exposures and hazards

contributed to:

**5.4%** of total burden of all musculoskeletal conditions

**17%** of the burden of back pain and problems

See Chapter 4.4 'Contribution of selected risk factors to burden of disease' for more information on definitions and the burden of disease associated with these conditions.

# Treatment and management

## In primary health care settings

Musculoskeletal conditions are primarily managed in primary health care settings by a range of health professionals. Treatment combines physical therapy, medicines (for pain and inflammation), self-management (such as diet and exercise), education on self-management and living with the condition, and referral to specialist care where necessary. Based on survey data, musculoskeletal conditions were managed at an estimated 18% of general practice visits in 2015–16 (Britt et al. 2016).

## In hospitals

Musculoskeletal conditions can also be managed in hospitals for more severe disease or when specialised treatment or surgery is needed. In 2015–16, there were more than 763,000 hospitalisations involving treatment and management of musculoskeletal conditions; this represented 7.2% of all hospitalisations in that year. Osteoarthritis was the most common musculoskeletal reason for hospitalisation (accounting for 33% of all musculoskeletal hospitalisations), followed by back pain and problems (22%). Other less common musculoskeletal reasons for hospitalisation were rheumatoid arthritis (1.7%), osteoporosis (1.1%), gout (1.0%) and juvenile arthritis (0.3%).

## Pharmacotherapy

As mentioned earlier, pharmacotherapy (medicines) is used extensively to manage musculoskeletal conditions. Many are non-prescription and bought over-the-counter, some are prescribed in primary care, and others—such as the specialised biologic disease-modifying anti-rheumatic drugs (bDMARDs)—can only be prescribed by a rheumatologist and administered in hospital. In 2015–16, 47% of hospitalisations for juvenile arthritis and 70% for rheumatoid arthritis involved at least one procedure for the administration of pharmacotherapy.

## Surgery

Joint replacement surgery is a common treatment for people with osteoarthritis who do not respond to medicines. Between 2005–06 and 2015–16, the rate of joint replacement surgery where osteoarthritis was the principal diagnosis increased by 36% for total knee replacements and 38% for total hip replacements (AOA 2017).

## What is missing from the picture?

The prevention, management and treatment of musculoskeletal conditions beyond hospital settings cannot currently be examined in detail due to limitations in available data on:

- primary and allied health care at the national level
- use of over-the-counter medicines to manage pain and inflammation
- diagnosis information for prescription pharmaceuticals (which would allow a direct link between musculoskeletal conditions and use of subsidised medicines)
- patient outcomes, pathways through the health system and quality of care.

## Where do I go for more information?

More information on arthritis and other musculoskeletal conditions is available at <[www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/arthritis-musculoskeletal-conditions/overview](http://www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/arthritis-musculoskeletal-conditions/overview)>.

## References

ABS (Australian Bureau of Statistics) 2015. National Health Survey: first results, 2014–15.

ABS cat. no. 4364.0.55.001. Canberra: ABS.

ABS 2016. Disability, ageing and carers, Australia: summary of findings, 2015. ABS cat. no. 4430.0. Canberra: ABS.

AOA (Australian Orthopaedic Association) 2017. Australian Orthopaedic Association National Joint Replacement Registry. Annual report. Adelaide: AOA.

Britt H, Miller GC, Henderson J, Bayram C, Harrison C, Valenti L et al. 2016. General practice activity in Australia 2015–16. General practice series no. 40. Sydney: Sydney University Press.

## 3.11 Chronic respiratory conditions

Chronic respiratory conditions affect the airways, including the lungs, as well as passages that transfer air from the mouth and nose into the lungs. These conditions are characterised by symptoms such as wheezing, shortness of breath, chest tightness and cough. Conditions include asthma, chronic obstructive pulmonary disease (COPD)—which covers emphysema and chronic bronchitis—allergic rhinitis ('hay fever') and other conditions such as chronic sinusitis, bronchiectasis, occupational lung diseases, sleep apnoea, pulmonary fibrosis and cystic fibrosis.

This snapshot focuses on asthma and hay fever (given the large numbers of people affected by these conditions) and COPD (given the poor health and wellbeing outcomes associated with this condition).

Risk factors associated with chronic respiratory conditions can be behavioural, environmental or genetic. These include tobacco smoking (particularly for COPD), exposure to viral infections and air pollutants, and inheritance of genes linked with respiratory illnesses such as cystic fibrosis.

### How common are chronic respiratory conditions?

Based on self-reported data from the Australian Bureau of Statistics 2014–15 National Health Survey (ABS 2015):

- chronic respiratory conditions are estimated to affect almost one-third (31% or 7 million people) of Australians
- the 2 most common respiratory conditions are hay fever and asthma, with hay fever affecting an estimated 4.5 million Australians (19% of the population) and asthma an estimated 2.5 million (11%)
- hay fever is most common in the middle years of life, and is most prevalent in people aged between 15 and 59
- asthma rates vary by sex and age, and are more common in males at younger ages (0–14) and more common in females at older ages (15 and over)
- 69% of persons with COPD said that they currently smoked cigarettes or had smoked cigarettes in the past (see Supplementary Table 3.11.2).

COPD, which mainly affects middle aged and older people, was less prevalent than hay fever or asthma, affecting an estimated 460,400 Australians aged 45 and over (5.1%). However, a large international study (Burden of Obstructive Lung Disease—BOLD), which tested the lung function of nearly 10,000 people, estimated that the prevalence of COPD in Australia was 7.5% for people aged 40 and over and 30% for people aged 75 and over (Toelle et al. 2013).



## Impact

Chronic respiratory diseases contribute substantially to the disease burden in the Australian population. The Australian Burden of Disease Study found that, in 2011, respiratory conditions contributed 8.3% of the total burden of disease and injury in Australia:

- Respiratory diseases were ranked as the sixth leading contributor to total burden, after cancer, cardiovascular diseases, mental and substance use disorders, musculoskeletal conditions, and injuries.
- COPD contributed the highest percentage of total burden of all respiratory conditions (43%), followed by asthma (29%) and upper respiratory conditions (including hay fever, 20%).
- Burden associated with respiratory diseases rose with increasing remoteness and was higher among people in lower socioeconomic areas.

COPD was the fifth leading underlying cause of death in Australia in 2016, with 7,212 deaths (4.6% of all deaths); 70% (5,056) of these deaths were of people aged 75 and over. Further:

- between 2005 and 2015, among people aged 45 and over, the age-standardised death rate for COPD slowly increased, from 64 to 70 deaths per 100,000 population, but dropped slightly in 2016 to 68 deaths per 100,000
- between 2011 and 2015, among people of all ages, the age-standardised death rates for asthma remained steady at 1.5 deaths per 100,000 population but increased to 1.6 deaths per 100,000 in 2016 (Figure 3.11.1)
- in 2016, there were 455 deaths due to asthma and 381 deaths due to bronchiectasis.

An example of the tragic impact of respiratory conditions occurred in November 2016 in Melbourne, Victoria. Nine people died and several thousands were hospitalised due to asthma associated with a thunderstorm that triggered high pollen levels in the local environment (see Chapter 4.1 'Impacts of the natural environment on health').

## Treatment and management

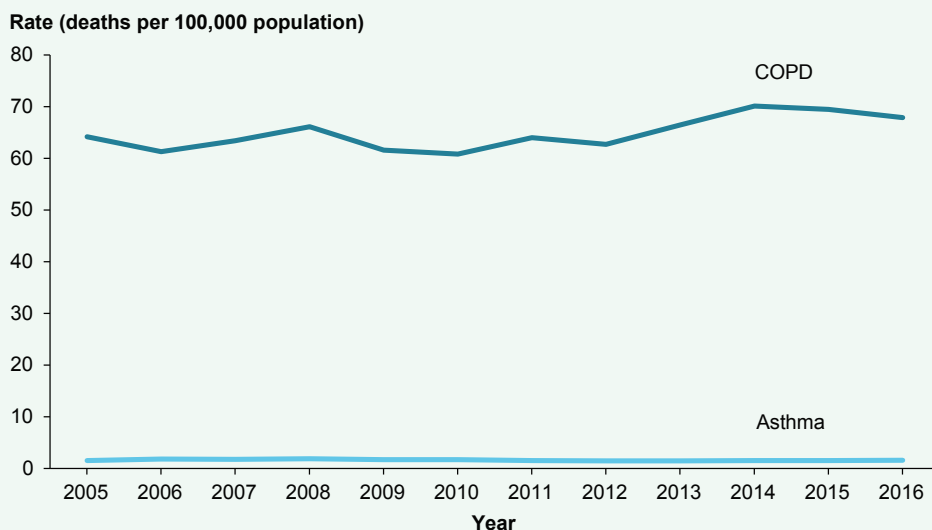
In most cases, chronic respiratory conditions are managed in primary health care.

In 2014–15, an estimated 61% of people with asthma reported visiting a general practitioner specifically for their asthma at least once in the previous year (ABS 2017). In the previous survey in 2011–12, an estimated 57% of people with asthma reported visiting a general practitioner specifically for their asthma at least once in the previous year (ABS 2013). In 2014–15, an estimated 75% of children aged 0–14 with asthma were reported to have visited a general practitioner at least once for their asthma in the last year (ABS 2017).

Asthma guidelines recommend that all people with asthma should have a written asthma action plan. However, in 2014–15, based on self-reported survey data, only an estimated 28% of people with asthma as a long-term condition had a written asthma action plan (with 24% reported to have one in 2011–12; ABS 2013). In 2014–15, an estimated 57% of children aged 0–14 with asthma were reported to have an asthma action plan (ABS 2017).

Between 2005–06 and 2015–16, the age-standardised hospitalisation rates for asthma fell 12% (from 192 to 169 hospitalisations per 100,000 population). Over the same period, rates for COPD fluctuated (from a low of 670 to a high of 731 hospitalisations per 100,000 population aged 45 and over) (Figure 3.11.2).

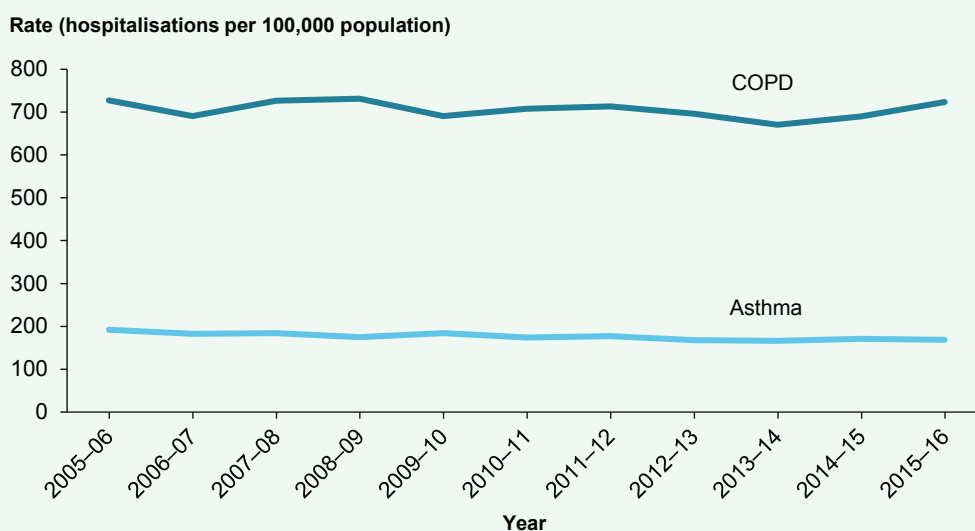
**Figure 3.11.1: Age-standardised death rates for asthma (all ages) and COPD (aged 45 and over), 2005–2016**



Note: Rates have been age standardised to the 2001 Australian population.

Source: National Mortality Database; Table S3.11.1.

**Figure 3.11.2: Age-standardised hospitalisation rates for asthma (all ages) and COPD (aged 45 and over), 2005–06 to 2015–16**



Note: Rates have been age standardised to the 2001 Australian population.

Source: National Hospitals Morbidity Database; Table S3.11.1.

## What is missing from the picture?

The prevention, management and treatment of chronic respiratory conditions beyond hospital settings (including the appropriateness of care relating to clinical guidelines) cannot be examined in detail because of a lack of data on primary health care. Data linkage can improve the understanding of pathways through the health system.

Many adults have features of both asthma and COPD, known as asthma–COPD overlap; further work is needed to better measure this overlap. It is important to identify and measure people with asthma–COPD overlap as they are at higher risk than patients with asthma or COPD alone; they have more symptoms, more flare-ups, greater need to use health care, and a higher mortality (National Asthma Council Australia and Lung Foundation Australia 2017).

## Where do I go for more information?

More information on chronic respiratory conditions in Australia is available at [www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/asthma-other-chronic-respiratory-conditions/overview](http://www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/asthma-other-chronic-respiratory-conditions/overview). The report *The burden of chronic respiratory conditions in Australia: a detailed analysis of the Australian Burden of Disease Study 2011* and other recent publications can be downloaded from the AIHW website.

## References

- ABS (Australian Bureau of Statistics) 2013. Australian Health Survey: health service usage and health related actions, 2011–12. Table 7.3. ABS cat. no. 4364.0.55.002. Canberra: ABS.
- ABS 2015. National Health Survey: first results 2014–15. ABS cat. no. 4364.0.55.001. Canberra: ABS.
- ABS 2017. Health service usage and health related actions, Australia, 2014–15. Table 7.3. ABS cat. no. 4364.0.55.002. Canberra: ABS.
- National Asthma Council Australia and Lung Foundation Australia 2017. Asthma–COPD overlap. Melbourne: National Asthma Council Australia.
- Toelle BG, Xuan W, Bird TE, Abramson MJ, Atkinson DN, Burton DL et al. 2013. Respiratory symptoms and illness in older Australians: the Burden of Obstructive Lung Disease (BOLD) study. *Medical Journal of Australia* 198:144–8.

## 3.12 Mental health

Good mental health is a state of wellbeing in which an individual realises their own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to contribute to their community (WHO 2014). A considerable proportion of the Australian population will experience a mental illness at some time in their life (see Chapter 3.13 'Eating disorders'; Chapter 4.7 'Illicit drug use'; Chapter 5.4 'People with disability').

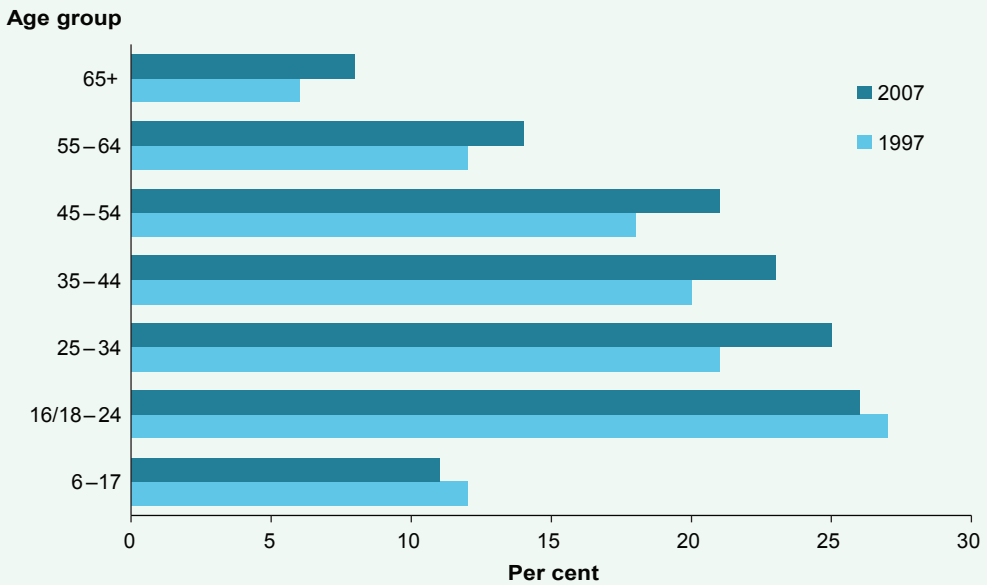
The terms 'mental illness' and 'mental disorder' are often used interchangeably and describe a wide range of mental health and behavioural disorders which vary in duration and/or severity. The effect of mental illness on the individuals, families and/or carers concerned can be severe and its influence on society as a whole is far reaching. Social problems often associated with mental illness include poverty, unemployment or reduced productivity, and homelessness. People with mental illness may also experience isolation, discrimination and stigma.

### How common is mental illness?

Australia's National Survey of Mental Health and Wellbeing is a program of three targeted mental health epidemiological surveys. Together, these surveys provide a detailed view of the prevalence of mental disorders in Australia:

- The adult component of the National Survey of Mental Health and Wellbeing (conducted most recently in 2007) estimates that around 8.5 million (45%, based on the estimated 2015 population) Australians aged 16–85 will experience a high prevalence mental disorder, such as depression, anxiety or a substance use disorder in their lifetime. Around 20% of the population experienced a common mental disorder in a 12-month period. Of these, *Anxiety disorders* (such as social phobia) were the most prevalent, affecting 1 in 7 (14%) people, followed by *Affective disorders* (such as depression) (6.2%) and *Substance use disorders* (such as alcohol dependence) (5.1%) (ABS 2008). The age distribution of high prevalence mental disorders in 2007 was similar to that found 10 years earlier from the same survey (conducted in 1997/1998, depending on the age group) (Figure 3.12.1).
- The National Survey of People with Psychotic Illness (conducted most recently in 2010) showed that almost 64,000 people with a psychotic illness are in contact with public specialised mental health services each year (Morgan et al. 2011). The survey did not cover private service providers, such as private psychiatrists, psychologists and private hospitals.
- The Australian Child and Adolescent Survey of Mental Health and Wellbeing (conducted most recently in 2013–14) estimates that 560,000 children and adolescents aged 4–17 (almost 14%) experienced a mental disorder in the 12 months before the survey (Lawrence et al. 2015).

**Figure 3.12.1: Per cent of Australians with high prevalence mental disorders, by age group, 1997 and 2007**



*Notes*

1. For the 6-17 age group, the data are for 1998 and 2013-14.
2. For the 16-18 to 24 age group, the 1997 data relate to people aged 18-24 and the 2007 data to people aged 16-24.
3. Prevalence data from the National Survey of People with Psychotic Illness are not included in this figure.
4. Some caution should be exercised in comparing findings from the two adult surveys because they sampled from slightly different age ranges and used somewhat different approaches to gauge the presence of mental illness in the past 12 months. It may be that these differences in method account for the small increase in overall prevalence over time.

*Sources:* Department of Health and Ageing 2013; Lawrence et al. 2015; Table S3.12.1.

## Impact

While the National Survey of Mental Health and Wellbeing provides valuable insights, the severity and duration of a mental illness are critical factors in understanding its impact on individuals, families and society as a whole. Severe and persistent mental illnesses, such as psychotic disorders, have a relatively low prevalence but have a substantial impact on individuals, their families and society due to the ongoing and sometimes extensive care needs required to support the individual. Mental and substance use disorders contributed 12% of Australia's total burden of disease in 2011, making it the third highest burden disease group.

A person experiencing poor mental health may not meet the diagnostic criteria for a mental disorder (Slade et al. 2009), but their condition may still have a negative impact on their life. Poor mental health may also be associated with suicidality—the collective term for suicidal ideation, suicide plans and suicide attempts. While suicidality is more common in people with mental disorders, it is not confined solely to this group (Slade et al. 2009).

People who experience suicidal ideation and make suicide plans are at increased risk of attempting suicide. At some point in their lives, 13% of Australians aged 16–85 have experienced suicidal ideation, 4.0% have made suicide plans and 3.3% have attempted suicide (Slade et al. 2009). Between 2007 and 2016, an average of around 2,600 Australians died by suicide each year (ABS 2017). Suicide and self-inflicted injuries contribute to 2.5% of Australia's total burden of disease (see Chapter 7.3 'Suicide prevention services').

## What is missing from the picture?

Given the passage of time since the last adult survey of mental health was conducted, it would be appropriate to consider cost-effective methods to update prevalence information on Australian adults.

There is also a lack of information on the activities of non-government community mental health organisations being used to support Australians with mental health issues. These services (both not-for-profit and for-profit) focus on wellbeing, support and assistance for people who live with mental illness rather than the assessment, diagnosis and treatment undertaken by clinical services.

## Where do I go for more information?

More information on mental health in Australia is available in [Mental Health Services in Australia](#) or [Australian Burden of Disease Study: impact and causes of illness and death in Australia 2011](#).

If you or someone you know needs help please call:

**Lifeline 13 11 14**

**beyondblue 1300 22 4636**

**Kids Helpline 1800 55 1800**

## References

ABS (Australian Bureau of Statistics) 2008. National Survey of Mental Health and Wellbeing 2007: summary of results. ABS cat. no. 4326.0. Canberra: ABS.

ABS 2017. Causes of death, Australia, 2016. ABS cat. no. 3303.0. Canberra: ABS.

Department of Health and Ageing 2013. National Mental Health Report 2013: tracking progress of mental health reform in Australia 1993–2011. Canberra: Department of Health and Ageing.

Lawrence D, Johnson S, Hafekost J, Boterhoven de Haan K, Sawyer M, Ainley J et al. 2015. The mental health of children and adolescents: report on the second Australian Child and Adolescent Survey of Mental Health and Wellbeing. Canberra: Department of Health.

Morgan VA, Waterreus A, Jablensky A, Mackinnon A, McGrath JJ, Carr V et al. 2011. People living with psychotic illness 2010: report of the second Australian National Survey. Canberra: Department of Health.

Slade T, Johnston A, Teesson M, Whiteford H, Burgess P, Pirkis J et al. 2009. The mental health of Australians 2: report on the 2007 National Survey of Mental Health and Wellbeing. Canberra: Department of Health and Ageing.

WHO (World Health Organization) 2014. Mental health: a state of well-being. Geneva: WHO. Viewed December 2017, <[http://www.who.int/features/factfiles/mental\\_health/en/](http://www.who.int/features/factfiles/mental_health/en/)>.

## 3.13 Eating disorders

Eating disorders are a group of mental illnesses typically characterised by problems associated with disordered eating or body weight control, and a severe concern with body weight or shape (Treasure et al. 2010). Disordered eating behaviours may include overeating or insufficient food intake. There are four types of commonly recognised eating disorders:

- anorexia nervosa—characterised by the persistent restriction of food and water intake, intense fear of gaining weight and disturbance in self-perceived weight or body shape
- bulimia nervosa—characterised by repeated binge-eating episodes followed by compensatory behaviours like self-induced vomiting or laxative misuse
- binge eating disorder—characterised by repeated episodes of binge-eating, often with a sense of loss of control while eating
- other specified feeding or eating disorder—people with this disorder present with many of the symptoms of anorexia nervosa, bulimia nervosa or binge eating disorder, but may not meet the full criteria for diagnosis of one or more of these disorders (Fairweather-Schmidt & Wade 2014).

### How common are eating disorders?

It is difficult to get consensus on prevalence estimates for eating disorders in Australia (NEDC 2010). Estimates vary substantially between data sources due to different diagnostic thresholds and the small number of large-scale population research projects (Hay et al. 2015). The estimated prevalence of any eating disorder varies, depending on whether narrower clinical diagnostic or broader behavioural criteria are used. For Australians aged 15 and over, estimated prevalence is 4–16% (Hay et al. 2008; Hay et al. 2015; Wade et al. 2006). Estimated prevalence varies according to the type of disorder—research suggests binge eating disorder and other specified feeding or eating disorder are the most prevalent disorders in Australia (Hay et al. 2017; Wade et al. 2006).

### Impact

Eating disorders cause considerable psychological distress. They were ranked as the 10th leading cause of non-fatal disease burden for females aged 15–44 in 2011.

The report *Paying the price: the economic and social impact of eating disorders in Australia*, commissioned by The Butterfly Foundation, notes that there are few data on the economic costs of eating disorders (Deloitte Access Economics 2012). The report suggests, though, that the social and economic costs due to eating disorders are substantial. Based on 2008–09 AIHW health expenditure data, adjusted for inflation, the report estimates that, in 2012, costs to the health system related to eating disorders may have been close to \$100 million, with the resulting impact on productivity being as high as \$15 billion.

## Treatment and management

Australians with eating disorders may access treatment through a range of health care settings. These include specialised and non-specialised mental health services, such as community mental health care and admitted patient care. National data on hospital admitted patient care show that, in 2015–16, there were about 8,000 overnight and same-day hospitalisations of people with a principal diagnosis of any eating disorder. Of these hospitalisations, 61% included those for specialised admitted patient psychiatric care (Supplementary Table S3.13.2). As well, about 104,000 community mental health service contacts had a principal diagnosis of eating disorders in 2015–16.

Australians with eating disorders may also present to primary health care services, such as general practitioners. However, data are generally lacking on people with eating disorders accessing health services.

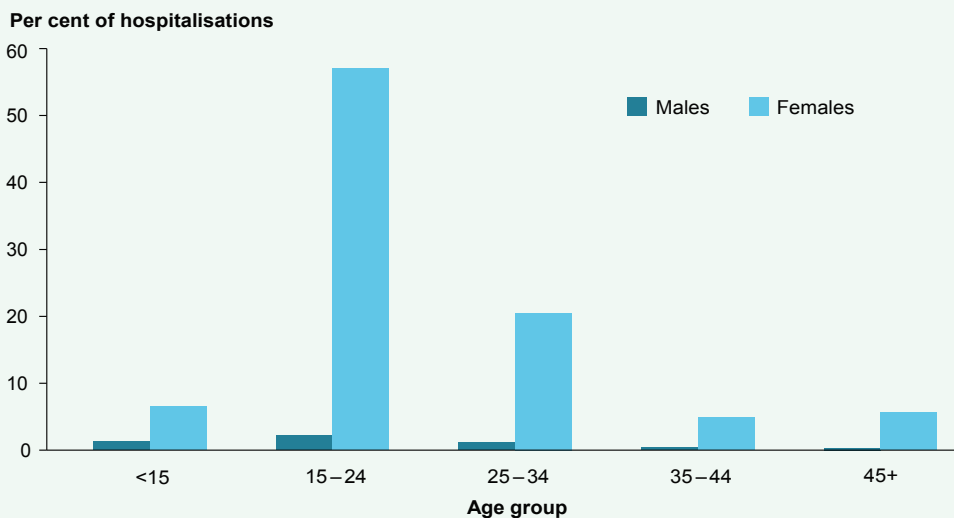
A wide variety of specialised eating disorder services and organisations can be accessed by people needing support, including child and adolescent mental health services and specialised inpatient eating disorder services (Victorian Department of Health 2014).

## Variation by population groups

Eating disorders may occur at any stage of life, but research suggests that they occur most often among young women (Hay et al. 2008; Hay et al. 2017; Wade et al. 2006). The Australian Child and Adolescent Survey of Mental Health and Wellbeing estimated that, in 2012–13, 2.4% of young people aged 11–17 reported problem eating behaviours (Lawrence et al. 2015). A greater proportion of females (3.5%) than males (1.4%) reported these behaviours (Lawrence et al. 2015).

In 2015–16, 95% of Australian hospitalisations with a principal diagnosis of an eating disorder were for females. Females aged 15–24 made up the largest proportion of these hospitalisations (57%) (Figure 3.13.1).

**Figure 3.13.1: Hospitalisations with a principal diagnosis of eating disorders, by age and sex, 2015–16**



Source: National Hospital Morbidity Database; Table S3.13.1.



In 2015–16, 58% of community mental health care contacts with a principal diagnosis of eating disorders were provided to girls and women aged 15–24. The next largest proportion of those contacts (14%) were provided to girls aged under 15 (Supplementary Table S3.13.3).

## What is missing from the picture?

There is a lack of nationally consistent data on eating disorders, especially prevalence, estimated costs to society, and service access (NEDC 2010).

## Where do I go for more information?

More information about eating disorders is available from The Butterfly Foundation <[www.thebutterflyfoundation.org.au](http://www.thebutterflyfoundation.org.au)> and The National Eating Disorders Collaboration <[www.nedc.com.au](http://www.nedc.com.au)>.

## References

- Deloitte Access Economics 2012. Paying the price: the economic and social impact of eating disorders in Australia. Report commissioned by The Butterfly Foundation. Melbourne: The Butterfly Foundation.
- Fairweather-Schmidt K & Wade TD 2014. DSM-5 eating disorders and other specified eating and feeding disorders: is there a meaningful differentiation? *International Journal of Eating Disorders* 47:524–33.
- Hay P, Mitchison D, Collado AEL, Gonzalez-Chica DA, Stocks N & Touyz S 2017. Burden and health-related quality of life of eating disorders, including Avoidant/Restrictive Food Intake Disorder (ARFID), in the Australian population. *Journal of Eating Disorders* 5:21.
- Hay PJ, Girosi F & Mond J 2015. Prevalence and sociodemographic correlates of DSM-5 eating disorders in the Australian population. *Journal of Eating Disorders* 3:19.
- Hay PJ, Mond J, Buttner P & Darby A 2008. Eating disorder behaviors are increasing: findings from two sequential community surveys in South Australia. *PLoS ONE* 3:e1541.
- Lawrence D, Johnson S, Hafekost J, Boterhoven De Haan K, Sawyer M, Ainley J et al. 2015. The mental health of children and adolescents. Report on the second Australian Child and Adolescent Survey of Mental Health and Wellbeing. Canberra: Department of Health.
- NEDC (National Eating Disorders Collaboration) 2010. Eating disorders prevention, treatment & management: an evidence review. Report compilation led by The Butterfly Foundation. Viewed 2 February 2018, <<http://www.nedc.com.au>>.
- Treasure J, Claudino AM & Zucker N 2010. Eating disorders. *The Lancet* 375:583–9.
- Victorian Department of Health 2014. Victorian eating disorders strategy. Melbourne: Victorian Department of Health.
- Wade TD, Bergin JL, Tiggemann M, Bullik CM & Fairburn CG 2006. Prevalence and long-term course of lifetime eating disorders in an adult Australian twin cohort. *Australian and New Zealand Journal of Psychiatry* 40:121–9.

## 3.14 Dementia

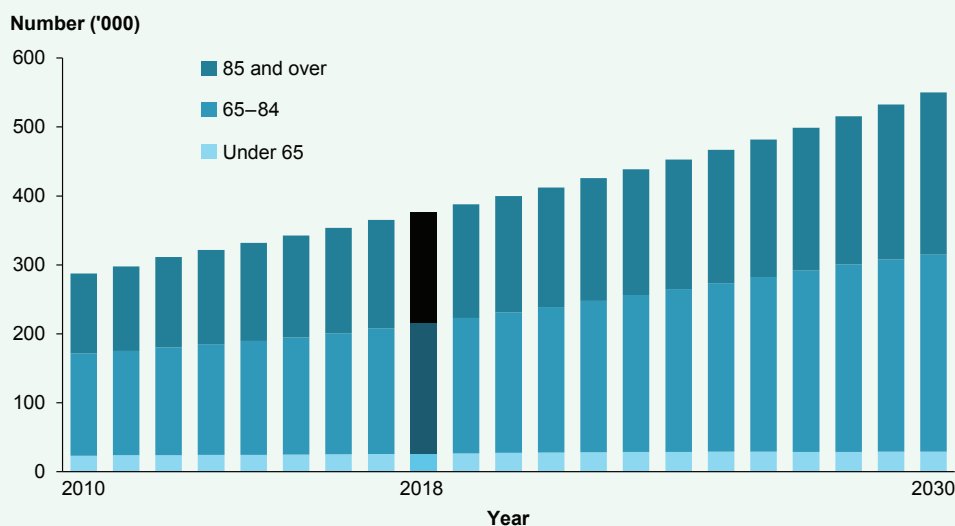
Dementia is a term used to describe a group of similar conditions that gradually impair brain function. It is commonly associated with memory loss, but can affect speaking, thinking and moving. A person's personality may also change, and health and functional ability generally decline as the condition progresses. Dementia not only affects individuals with the condition but also has a substantial impact on their families and carers, and society more broadly.

### How common is dementia?

Australian data on dementia prevalence are lacking, so the following estimates are based on international information, adjusted for the Australian context.

In 2018, an estimated 376,000 people in Australia had dementia; this figure is projected to grow to 550,000 by 2030 (Figure 3.14.1).

**Figure 3.14.1: Estimated number of people with dementia, by age, 2010–2030**



Source: AIHW 2012; Table S3.14.1.

In 2018, around three-fifths (61%) of people with dementia were women, and two-fifths (43%) were aged 85 and over. A similar number of men and women had dementia in the younger age groups, but, among people aged 85 and over, there were more than twice as many women as men (partly the result of the higher proportion of women in this age group).

An estimated 8.7% of people aged 65 and over in Australia had dementia in 2018. However, the rate of dementia varies between population subgroups: for example, dementia prevalence is estimated to be 2–5 times higher among Aboriginal and Torres Strait Islander people than among non-Indigenous people, and Indigenous Australians experience many risk factors for dementia (such as heart disease, diabetes and tobacco use) at higher rates than non-Indigenous people (Flicker & Holdsworth 2014; Li et al. 2014; Radford et al. 2015; Smith et al. 2008).

## Impact

Dementia is more common among older people. Hence, the number of deaths due to dementia has been increasing steadily alongside the growing number of older people in the population—Australia's ageing population and increases in life expectancy increase the effect dementia has on society.

Among people aged 65 and over, dementia was the second leading cause of total burden of disease in 2011 (accounting for 7.8% of years of life lost due to illness or death) and the leading cause of non-fatal burden (accounting for 10% of years of life lost due to living with the disease).

In 2016, dementia replaced heart disease as the leading underlying cause of death for women, remaining the third leading cause for men (ABS 2017). This may reflect not only an increase in the number of older people with dementia, but also changes in how dementia deaths are recorded. There were more than 25,000 deaths in 2016 where dementia was considered either to have directly led to the death (as the underlying cause), or to have contributed to it (as an associated cause)—almost 69 deaths each day. When trends over time were considered, the balance between dementia being recorded as an associated, rather than an underlying, cause of death changed. In 2007, for every death where dementia was recorded as the underlying cause, there were 1.4 deaths where it was recorded as the associated cause. By 2016, the ratio was 0.9, meaning that there were slightly more deaths recorded as being due to, rather than involving, dementia.

See chapters 3.1 'Burden of disease across the life stages', 3.2 'Leading causes of death' for more information on burden of disease and deaths.

## Risk factors

Several factors to which people are exposed over their lifetime, or at particular points in their life, are known to contribute to the risk of developing dementia. These include some unmodifiable risk factors, such as age, genetics and family history. A number of other factors, however, can be altered or treated—that is, they are considered modifiable risk factors. Reducing these could reduce the prevalence of dementia.

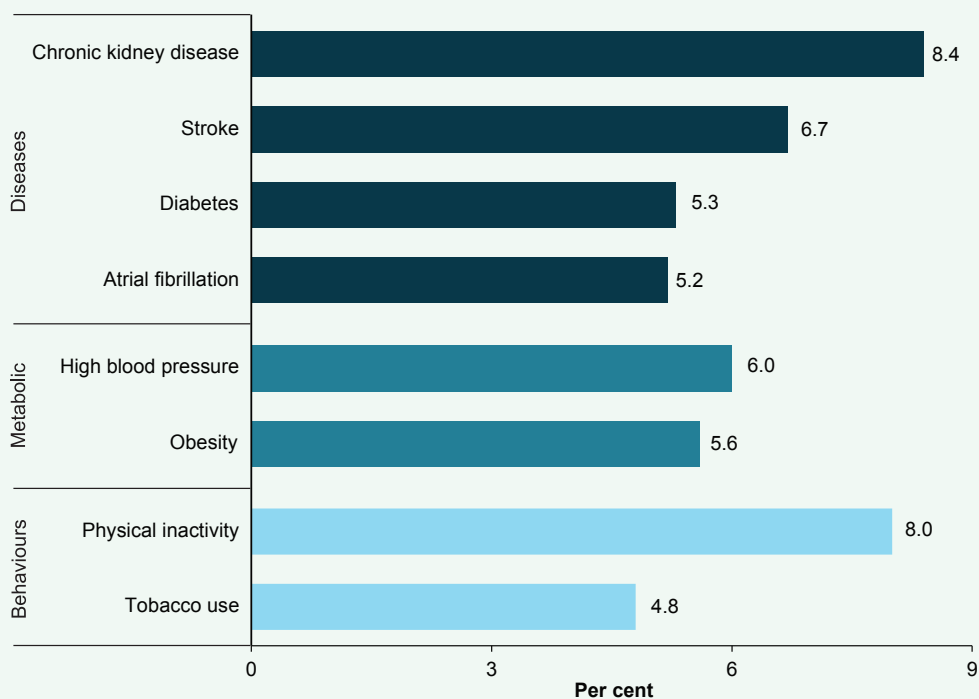
Many modifiable risk factors assessed to have a causal association with dementia are also associated with vascular diseases (such as coronary heart disease and stroke). 'Vascular' risk factors for dementia include behavioural risk factors (tobacco smoking and physical inactivity) and metabolic risk factors (high blood pressure and obesity), as well as some vascular diseases themselves (stroke, diabetes, atrial fibrillation and chronic kidney disease).

Jointly, these vascular risk factors represented 30% of the total burden from dementia in Australia in 2011. This means that almost one-third of healthy years of life lost due to premature death or ill health from dementia were accounted for by the combined effects of these eight factors.

Individually, vascular risk factors were each responsible for 5.2–8.4% of the dementia burden. The individual vascular risk factors (assessed to have a convincing causal association with dementia) that contributed most to the dementia burden were physical

inactivity (8.0%), stroke (6.7%) and high blood pressure (6.0%). Chronic kidney disease was assessed to have a probable causal association with dementia and was responsible for 8.4% of dementia burden (Figure 3.14.2). However, the largest health gains could be achieved by reducing the prevalence of vascular risk factors that are trending upwards, namely diabetes and obesity.

**Figure 3.14.2: Contribution of vascular risk factors to dementia burden in Australia, by risk factor, 2011**



Source: AIHW 2016; Table S3.14.2.

## Treatment and management

There is no known cure for dementia. Dementia care generally focuses on alleviating the behavioural and psychological symptoms of the condition through various medications or non-drug therapies and support. Four dementia-specific drugs are available for Alzheimer disease: donepezil for mild, moderate and severe disease; galantamine and rivastigmine for mild to moderately severe; and memantine for moderately severe to severe. They are subsidised through the Pharmaceutical Benefits Scheme. In 2015, 514,000 Pharmaceutical Benefits Scheme prescriptions were dispensed for these medications (Department of Health 2016).

People with dementia may also use a mix of health and aged care services. For example, 22,200 people aged 65 and over were admitted to hospital in New South Wales in 2015–16 with dementia as the principal diagnosis or comorbidity (CEE 2016). Nationwide, as at 30 June 2017, 89,500 people with dementia were living in permanent residential aged care (representing around half of all people in care).

## What is missing from the picture?

Currently, there are no national data on how many people in Australia are affected by dementia—instead, numbers are estimated based on international data and modelling. While combining multiple sources to identify dementia cases has been shown to produce plausible prevalence estimates (Waller et al. 2017), the lack of comprehensive data affects the ability to monitor the incidence and prevalence of dementia and how it is treated and managed. Data linkage may improve understanding of patient outcomes and disease interactions.

## Where do I go for more information?

More information on deaths and leading causes of death in Australia, including the General Incidence of Mortality (GRIM) books and Mortality Over Regions and Time (MORT) books, is available on the AIHW website at <[www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/life-expectancy-deaths/overview](http://www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/life-expectancy-deaths/overview)>. More information on vascular risk factors for dementia is available in the AIHW report *Contribution of vascular diseases and risk factors to the burden of dementia in Australia*. Further information on dementia is available at <[www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/dementia/](http://www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/dementia/)> and in the report *Dementia in Australia*.

## References

- ABS (Australian Bureau of Statistics) 2017. Causes of death, Australia, 2016. ABS cat. no. 3303.0. Canberra: ABS.
- AIHW (Australian Institute of Health and Welfare) 2012. Dementia in Australia. Cat. no. AGE 70. Canberra: AIHW.
- AIHW 2016. Contribution of vascular diseases and risk factors to the burden of dementia in Australia: Australian Burden of Disease Study 2011. Australian Burden of Disease Study series no. 9. Cat. no. BOD 10. Canberra: AIHW.
- CEE (Centre for Epidemiology and Evidence) 2016. HealthStats NSW: dementia hospitalisations. Sydney: NSW Health. Viewed 21 November 2017, <[http://www.healthstats.nsw.gov.au/Indicator/bod\\_dementhos/bod\\_dementhos](http://www.healthstats.nsw.gov.au/Indicator/bod_dementhos/bod_dementhos)>.
- Department of Health 2016. Australian statistics on medicines 2015. Canberra: Department of Health. Accessed 21 Feb 2018, <<http://www.pbs.gov.au/info/statistics/asm/asm-2015>>.
- Flicker L & Holdsworth K 2014. Aboriginal and Torres Strait Islander people and dementia: a review of the research. *Alzheimer's Australia* 41. Canberra: Alzheimer's Australia.
- Li SQ, Guthridge SL, Eswara Aratchige P, Lowe MP, Wang Z, Zhao Y et al. 2014. Dementia prevalence and incidence among the Indigenous and non-Indigenous populations of the Northern Territory. *Medical Journal of Australia* 200:465–9.
- Radford K, Mack HA, Draper B, Chalkley S, Daylight G, Cumming R et al. 2015. Prevalence of dementia in urban and regional Aboriginal Australians. *Alzheimer's & Dementia* 11(3):271–9.
- Smith K, Flicker L, Lautenschlager NT, Almeida O, Atkinson P, Dwyer D et al. 2008. High prevalence of dementia and cognitive impairment in Indigenous Australians. *Neurology* 71:1470–3.
- Waller M, Mishra GD & Dobson AJ 2017. Estimating the prevalence of dementia using multiple linked administrative health records and capture—recapture methodology. *Emerging Themes in Epidemiology* 14(3). Viewed 21 November 2017, <<https://dx.doi.org/10.1186%2Fs12982-017-0057-3>>.

## 3.15 Injury

Injury is a major contributor to mortality, morbidity and permanent disability in Australia. In 2011, it accounted for 8.8% of the total burden of disease in Australia, and was the fifth leading cause of burden. Based on self-reported data, 7.0% of the main long-term health conditions experienced by the estimated 4.3 million Australians living with disability occurred due to injury or poisoning (ABS 2016).

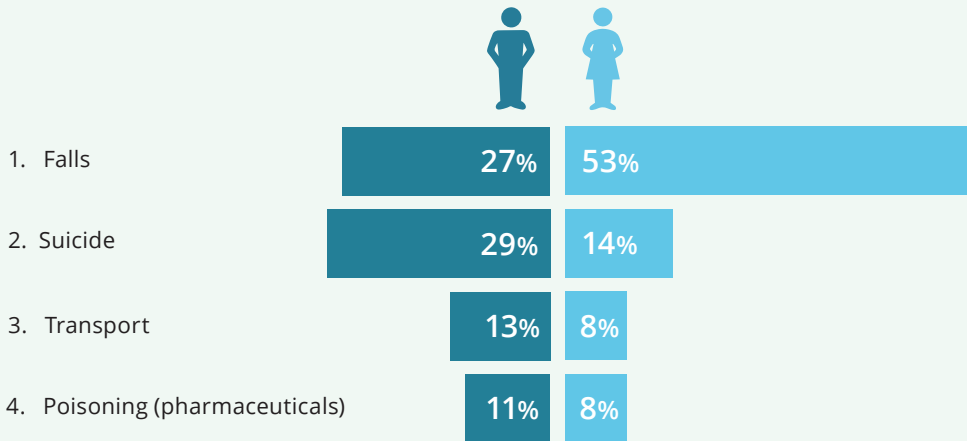
This snapshot describes the overall patterns of injury in Australia. Other chapters of this report describe injury in the context of family, domestic and sexual violence (see Chapter 3.16 'Family, domestic and sexual violence') and opioid use and misuse (see Chapter 3.17 'Opioid harm').

### How common is injury?

#### Injury deaths

- Injury was recorded as a cause of more than 12,600 deaths in 2014–15 in Australia—8.1% of all deaths.
- The age-standardised rate of injury deaths in 2014–15 was 48 per 100,000 population. This rate has remained relatively steady since 2004–05, following a decrease from 55 per 100,000 population in 1999–00.
- Injury death rates were highest for men and women aged over 65; 42% of male injury deaths and 68% of female injury deaths occurred in this age group.
- Injury death rates for males were higher than for females in every age group, especially at ages 25–44.
- The most common causes of injury deaths were falls (37% of all deaths), suicide (23%) and transport crashes (11%), though there were differences in the leading causes of injury death for males and females (Figure 3.15.1). For males, suicide was the leading cause (29% of all male injury deaths); for females, falls were the leading cause (53% of female injury deaths).
- Age-standardised rates of injury deaths for Aboriginal and Torres Strait Islander people were twice the rate for non-Indigenous people (97 and 48 deaths per 100,000 population, respectively).
- Rates of injury death increased with increasing remoteness—from 43 deaths per 100,000 population in *Major cities* to 88 deaths in *Very remote* areas.

Figure 3.15.1: Proportion of injury deaths, leading causes, by sex, 2014–15



Source: AIHW: Henley & Harrison, forthcoming 2018a; Table S3.15.1.

## Hospitalised injury cases

- In 2014–15, there were more than 480,000 cases of hospitalised injury in Australia.
- Hospitalised injuries can range from single fractures to catastrophic injuries, such as spinal cord injury or severe traumatic brain injury. About 1 in 6 (15%) hospitalised injury cases were classified as 'high threat to life'. Serious injuries often cause persisting problems and ongoing need for health care services.
- The main causes of hospitalised injury were falls (41%), followed by injury due to inanimate mechanical forces (for example, being struck by an object, including sports equipment, or contact with powered tools; 14%), and transport crashes (12%).
- Males accounted for more than half (55%) of all injury cases. The rate of injury for males overall was 2,300 cases per 100,000 males, compared with 1,600 per 100,000 females.
- For both males and females, age-specific rates of injury were much higher in age groups above age 75. Males had a higher rate of injury than females across all age groups up to about ages 65–69; in older age groups, females had much higher rates.
- The number of hospitalised injury cases per 100,000 population was higher for Indigenous people (3,600) than for Other Australians (1,900).

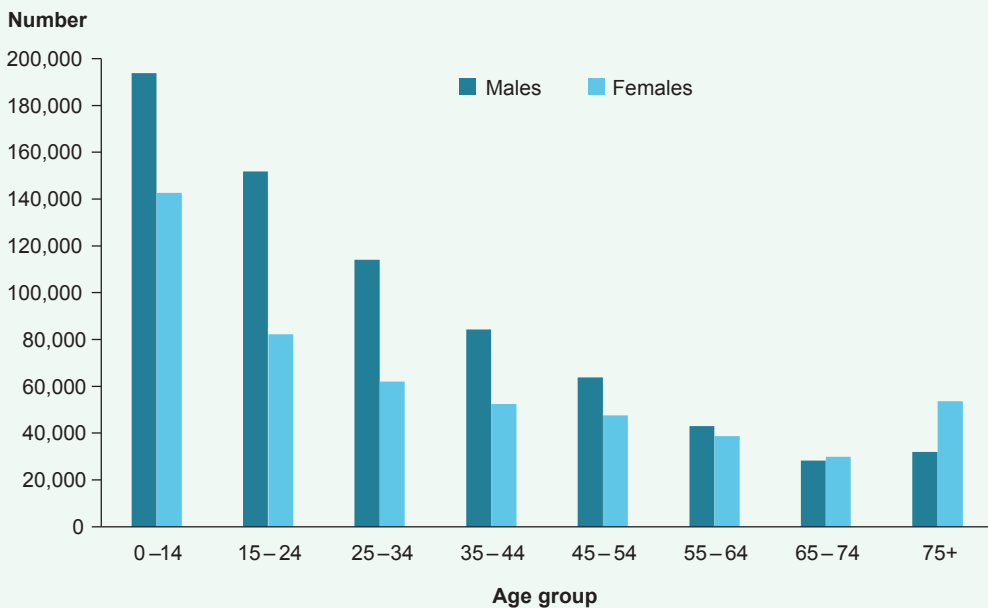
## Presentations to public hospital emergency departments

Information on injury occurrence is also available from data on why people present to hospital emergency departments.

Data on the main diagnosis are available in a consistent format for 68% of all emergency department presentations. These data show that there were 1.3 million presentations for injury in 2013–14 (27% of the emergency presentations for which suitable data were available). This would be equivalent to an estimated 1.9 million presentations for injury across all Australian public hospital emergency departments.

More than one-quarter (28%) of presentations to emergency departments for injury were for children aged 0–14, with a further 19% for people aged 15–24 (Figure 3.15.2).

**Figure 3.15.2: Injury-related emergency department presentations, by age and sex, 2013–14**



Source: AIHW: Henley & Harrison, forthcoming 2018b; Table S3.15.2.

Overall, 22% of emergency department presentations were for soft-tissue injury, 21% for fractures and 18% for open wounds.

Most people treated for an injury in an emergency department were not admitted for further care in hospital (82%). The likelihood of being admitted varied by the nature of the injury: people with internal organ injuries, intracranial injuries, or exposure to poisons or toxins were most likely to be admitted (86%, 44% and 45%, respectively), though these cases accounted for only 5.9% of all injury presentations to emergency departments.



## What is missing from the picture?

Limited data are available on cases treated in other health care settings, including by general practitioners, at sports medicine clinics, by physiotherapists and elsewhere.

As noted, the data available on emergency presentations are incomplete. Also, the nationally available data include very limited information on the events and circumstances that result in the injury (for example, transport crashes).

Many injury cases, especially (but not only) those needing hospital admission, leave the person with long-lasting disability. Data linkage can improve the understanding of patient outcomes and pathways through the health system.

## Where do I go for more information?

More information about hospitalisations and deaths due to injury in Australia is available at [www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/injury/overview](http://www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/injury/overview).

## References

ABS (Australian Bureau of Statistics) 2016. Disability, ageing and carers, Australia: summary of findings, 2015, data cubes. ABS cat. no. 4430.0. Canberra: ABS. Viewed 21 February 2018, <<http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4430.02015?OpenDocument>>.

AIHW (Australian Institute of Health and Welfare): Henley G & JE Harrison, forthcoming 2018a. Trends in injury deaths, Australia, 1999–00 to 2014–15. Injury research and statistics series no. 112. Cat. no. INJCAT 192. Canberra: AIHW.

AIHW: Henley G & Harrison JE, forthcoming 2018b. Use of emergency department data to enhance routine injury surveillance: technical report. Canberra: AIHW.

## 3.16 Family, domestic and sexual violence

Family, domestic and sexual violence (FDSV) is a major health and welfare issue in Australia (see Glossary for definitions). While men, women and children from all walks of life can experience FDSV, some groups are at particular risk, including Aboriginal and Torres Strait Islander women, young women, pregnant women and women with disability. Intimate partner violence has serious impacts on women's health. See Chapter 4.4 'Contribution of selected risk factors to burden of disease' for more information on the burden of disease impacts on women due to intimate partner violence.

This snapshot provides an overview of hospitalised assaults and deaths in the context of family and domestic relationships.

### How common is FDSV?

One in 6 (17%, or 1.6 million) Australian women have experienced physical or sexual violence by a current or former cohabiting partner, since the age of 15. Further, 1 in 16 (6.1%, or 0.5 million) men have experienced this kind of violence since the age of 15. For women who had children in their care while experiencing violence from a current partner, half (50%) said the children had seen or heard the violence; this proportion increased when the violence was perpetrated by a former partner (68%) (ABS 2017).

### Impact of FDSV

FDSV generates a range of responses and consequences, involving both health and welfare services. FDSV can have serious impacts on a victim's health. In 2011, it contributed to more burden of disease (the impact of illness, disability and premature death) than any other risk factor for women aged 25–44 (Ayre et al. 2016). Seven disorders or events were causally linked to exposure to intimate partner violence: depressive and anxiety disorders, early pregnancy loss, homicide and violence, suicide and self-inflicted injuries, alcohol use disorders, and children born prematurely or with low birthweight. Serious cases of FDSV can end in hospitalisation or death.

### Hospitalised injury

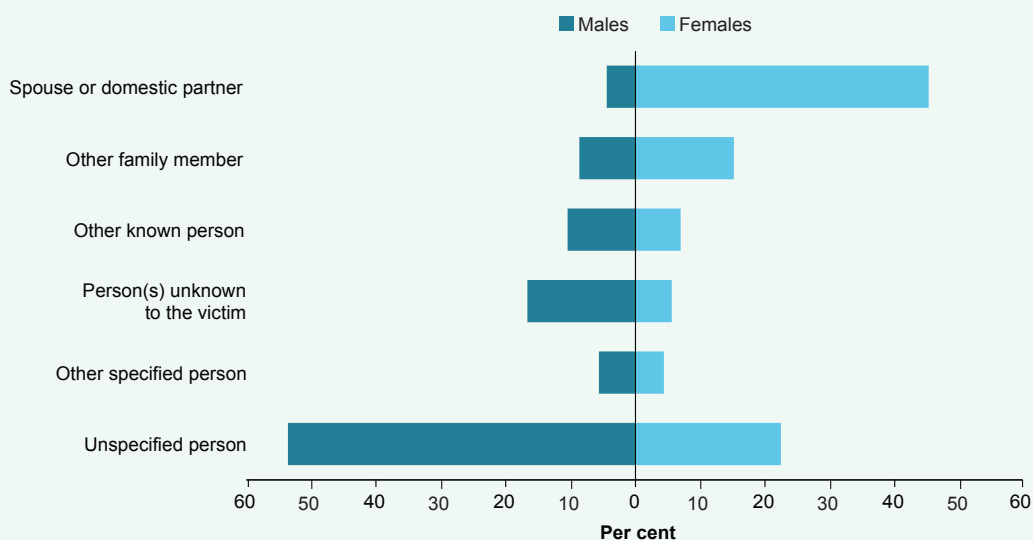
In 2014–15, there were more than 19,000 hospitalisations due to an assault injury. Of these hospitalisations, nearly 1 in 5 (18% or 3,400) people reported that the perpetrator was a *Spouse or domestic partner*, with *Other family member* reported for a further 8.8% (1,700 hospitalisations).

Where the perpetrator was identified, a *Spouse or domestic partner* was recorded for almost half (45%) of all hospitalisations of female assault victims—or more than 2,800 cases. For men, a *Spouse or domestic partner* was recorded as the perpetrator for almost

1 in 20 (4.4%) hospitalisations—or about 560 cases (Figure 3.16.1). Sex differences were also apparent in assault injury hospitalisations when the perpetrator was identified as *Other family member*, including *Parents* (15% of female hospitalisations compared with 8.6% of males).

The type of perpetrator for assault injury hospitalisations also differed by age group. For children, most perpetrators were *Parents* or *Other family members* (80% for children aged 0–4 and 40% for children aged 5–14). *Spouse or domestic partner* was the most commonly identified perpetrator among people aged 15–24 (13%) and 25–44 (22%). The most commonly identified perpetrator for people aged 65 and over was *Other family member* (23%).

**Figure 3.16.1: Assault injury hospitalisations, by reported perpetrator, by sex, 2014–15**



*Note:* Around half of all assault hospitalisations did not have a reported perpetrator, and results should be interpreted with some caution.

*Source:* National Hospital Morbidity Database; Table S3.16.1.

## Deaths

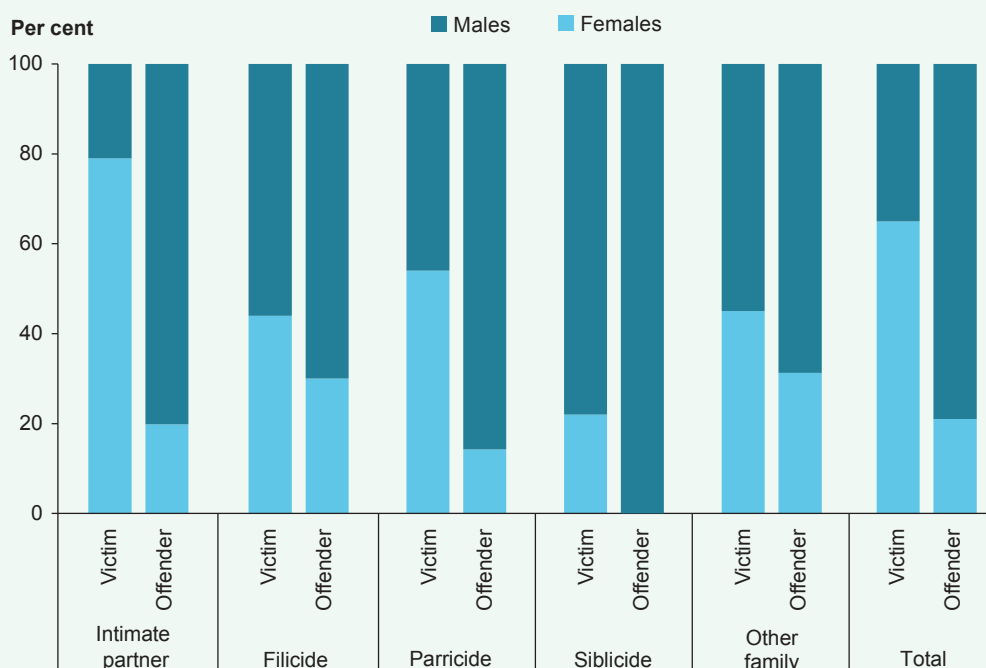
From 1 July 2012 to 30 June 2014, there were 487 homicide incidents, involving 512 victims. A domestic relationship was the most common relationship between a victim and the homicide offender; more than 200 domestic homicide incidents were recorded involving 213 victims and 200 perpetrators. Of these incidents:

- 63% (126) were intimate partner incidents
- 15% (30) were incidents involving a parent (or step-parent) killing a child (filicide)
- 10% (21) were incidents where a child killed a parent or step-parent (parricide)
- 8% (16) were other family incidents, such as those involving cousins, aunts/uncles, grandparents and so on
- 4% (7) were incidents where one sibling killed another (siblicide).

Females were predominantly the victims of domestic homicide (65%) and males largely the offenders (79%). Almost 4 in 5 (79% or 99) victims of intimate partner homicide between 2012 and 2014 were women (Figure 3.16.2)—this represents nearly 1 woman per week being killed by an intimate partner. Men were 80% of the offenders in cases of intimate partner homicide (Figure 3.16.2).

While females were over-represented as victims of all types of domestic homicide combined, males were over-represented as victims of some forms of domestic homicide, particularly homicides involving siblings (78%) (Figure 3.16.2). Males were 100% of the offenders for homicides involving siblings (Bryant & Bricknell 2017).

**Figure 3.16.2: Type of homicide, by gender of victims and offenders, 2012–13 to 2013–14**



Source: Bryant & Bricknell 2017; Table S3.16.2.

## What is missing from the picture?

While there are data for reporting on certain aspects of FDSV, there are notable gaps in respect to the health impacts of FDSV. For example, there is no national information—or incomplete or inconsistent capture of information—on emergency department presentations and general practitioner visits. This makes it difficult to answer questions to support research and policies, such as:

- What health services and responses do victims and perpetrators of FDSV need and use, and how coordinated are they?
- What are children's experiences of FDSV?
- What are the pathways, impacts and outcomes for victims and perpetrators of FDSV?
- Which groups are at greater risk of FDSV?
- How do the health impacts of FDSV vary by location (noting that data are available for some, but not all, states and territories)?
- What programs and interventions are the most effective to prevent and respond to FDSV?

These data gaps limit the extent to which we can understand the health impacts and outcomes for victims and perpetrators. There is also very limited information about specific at-risk groups, such as Indigenous people, children, culturally and linguistically diverse communities, and adults and children with disability.

## Where do I go for more information?

More information on FDSV is available at <[www.aihw.gov.au/reports-statistics/behaviours-risk-factors/domestic-violence/overview](http://www.aihw.gov.au/reports-statistics/behaviours-risk-factors/domestic-violence/overview)>. The report *Family, domestic and sexual violence in Australia 2018* and other recent releases are available for free download.

If you are experiencing domestic or family violence or know someone who is, please call **1800RESPECT (1800 737 732)** or visit the **1800RESPECT website**.

## References

- ABS (Australian Bureau of Statistics) 2017. Personal Safety Survey 2016. ABS cat. no. 4906.0. Canberra: ABS.
- Ayre J, Lum On M, Webster K, Gourley M & Moon L 2016. Examination of the burden of disease of intimate partner violence against women in 2011: final report (ANROWS Horizons, 06/2016). Sydney: ANROWS. Viewed 15 November 2016, <<http://media.aomx.com/anrows.org.au/s3fs-public/BoD%20Horizons.pdf>>.
- Bryant W & Bricknell S 2017. Homicide in Australia 2012–13 to 2013–14: National Homicide Monitoring Program Report. Canberra: Australian Institute of Criminology.

## 3.17 Opioid harm

Statistics for Australia show recent increases in the use of opioids, and opioid-related poisonings, overdoses and deaths. This reflects international trends.

Opioids are chemical substances that have a morphine-type action in the body. They are most commonly used for pain relief, but are addictive and can lead to dependence. Opioid drugs can be either illicit (predominantly heroin) or prescription (including codeine, which has been a prescription-only medication in Australia since February 2018). They include:

- opiates—drugs naturally derived from the opium poppy, such as codeine and heroin
- semi-synthetic opiates, such as hydromorphone and oxycodone
- synthetic opioids, such as fentanyl and methadone.

Because opioids are addictive, there is the potential for dependence and misuse for both therapeutic and illicit opioids. Harm from the use of opioids can be social (for example, crime), mental/behavioural and physical. This snapshot focuses on the physical and mental/behavioural harms, in particular poisonings and dependence.

### How common is opioid use and misuse?

#### Prescription opioids

Opioids are medically prescribed for two main reasons: pain management and the treatment of heroin and other opioid dependence—commonly referred to as Opioid Substitution Therapy or pharmacotherapy.

The AIHW's analysis of Pharmaceutical Benefits Scheme data shows that 11.1 million opioid prescriptions were dispensed in 2014–15.

Opioid prescriptions rose by 24% between 2010–11 and 2014–15, from 369 to 456 prescriptions per 1,000 population.

Oxycodone (and oxycodone/naloxone) accounted for 1 in 3 (34%) opioids prescribed in 2014–15, prescriptions for which increased by 68% over the period (from 2.3 million to 3.8 million). Codeine prescriptions were the second most common opioid prescription in 2014–15, accounting for almost 1 in 4 (23%).

#### Misuse and illicit use of opioids

Using self-reported data from the National Drug Strategy Household Survey of people aged 14 and over in 2016:

- 3.6% had recently used pharmaceutical opioids for non-medical purposes
- of those reporting use, over-the-counter codeine products were the most common (2.5%), followed by prescription codeine products (for example, Panadeine Forte) (1.4%). Less common was oxycodone (0.6%), tramadol (0.3%), morphine (0.1%) and fentanyl (<0.1%)
- only a small proportion (1.3%) reported ever using heroin in their life, and 0.2% reported using recently (in the last 12 months). However, 49% of recent users reported using heroin once a week or more.

# Impact

Opioid use and misuse can result in dependence, overdose, physical harm or, in the worst case, death. In 2011, opioid use was responsible for 0.9% of the total burden of disease and injuries. Most of the burden due to opioid use was due to accidental poisoning (63%) and opioid dependence (29%). A further 7.8% of the burden due to opioid use was from suicide and self-inflicted injuries.

The National Hospital Morbidity Database can be used to calculate the rate of hospitalisations with a principal diagnosis of poisoning or mental and behavioural disorders due to opioids. This rate indicates the impact over time on Australia's hospital system of opioid use and misuse. The National Mortality Database can be used to report on deaths from opioid poisoning.

In recent years, opioid-related hospitalisations and deaths have risen:

- In 2015–16, the rate of hospitalisations with an opioid-related principal diagnosis was 37 per 100,000 population, a 12% increase since 2011–12 (33 per 100,000 population).
- Analysis of the National Mortality Database found that, in 2016, more than 1,100 drug-induced deaths mentioned opioid poisoning (one or more times), up 89% from 591 deaths in 2007.



## Of opioid deaths in 2016:

- **550** mentioned **other opioids** (includes prescription painkillers such as oxycodone, morphine and codeine)
- **361** mentioned **heroin**
- **208** mentioned **methadone**
- **234** mentioned **other synthetic narcotics** (for example, fentanyl and tramadol).

# Treatment and management

Some treatment for acute poisoning and overdose is provided in hospitals to admitted patients or by emergency departments and general practitioners to non-admitted patients. There are also specialised Alcohol and Other Drug Treatment Services (AODTS) that provide a range of treatments for clients who use, misuse or are dependent on opioids. These treatments include counselling, information and education, rehabilitation, support and case management, withdrawal management and/or pharmacotherapy. Information about the treatment provided is captured in the AODTS National Minimum Data Set (see Chapter 7.19 'Specialised alcohol and other drug treatment services').

In 2016–17:

- heroin was the fourth most common principal drug of concern (5.2% of closed treatment episodes) and was listed as a drug of concern (principal or additional) in 7.5% of closed treatment episodes
- an opioid pharmaceutical (for example, codeine, oxycodone, fentanyl or methadone) was the principal drug of concern in 3.3% of closed treatment episodes and a drug of concern (principal or additional) in 6.8% of closed treatment episodes.

Opioid pharmacotherapy treatment is one of the main types of treatment used for opioid drug dependence. It involves replacing the opioid drug of dependence with a legally obtained, longer lasting opioid (methadone, buprenorphine or buprenorphine-naloxone) that is taken orally. Clients receive pharmacotherapy treatment for a range of opioid drugs (both prescribed and illegal) to reduce withdrawal symptoms, the desire to take opioids, and the euphoric effect of taking opioids. This treatment type is captured for a particular day (snapshot) in the National Opioid Pharmacotherapy Statistics Annual Data (NOPSAD) collection.

Based on the NOPSAD, on a snapshot day in June 2017, nearly 50,000 people in Australia (20 per 10,000 population) received opioid pharmacotherapy treatment. Of these clients:

- 38% reported heroin as their opioid drug of dependence, followed by oxycodone (5.2%), morphine (4.3%), codeine (4.2%) and methadone (4.1%)
- the median age (across all pharmacotherapy types) was 42
- around two-thirds (65%) were male.

## What is missing from the picture?

In Australia, medicines containing codeine were available over-the-counter until 1 February 2018. Reporting of pharmaceutical prescriptions does not reflect the total amount of codeine obtained before this date.

National data on drug-related ambulance attendances are currently not available. Emergency departments are a key source of treatment for opioid-related poisonings. No data on emergency department presentations are included in this snapshot due to data limitations (which limit the ability to accurately determine the substances involved in poisoning presentations).

This snapshot does not capture harms relating to violence and injury arising from opioid use because data are incomplete; it can also be difficult to attribute these harms to opioids directly.

## Where do I go for more information?

More information on opioid drug use is available at <[www.aihw.gov.au/reports-statistics/behaviours-risk-factors/illicit-use-of-drugs/overview](http://www.aihw.gov.au/reports-statistics/behaviours-risk-factors/illicit-use-of-drugs/overview)>.

More information on opioid treatment services is available at <[www.aihw.gov.au/reports-statistics/health-welfare-services/alcohol-other-drug-treatment-services/overview](http://www.aihw.gov.au/reports-statistics/health-welfare-services/alcohol-other-drug-treatment-services/overview)>.

More information on causes of death in Australia is available at <[www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/3303.0Main+Features12016?OpenDocument](http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/3303.0Main+Features12016?OpenDocument)>.

The following report and other recent releases relating to this topic are available for free download on the AIHW website: *Non-medical use of pharmaceuticals: trends, harms and treatment 2006–07 to 2015–16*.



## 3.18 Oral and dental health

Good oral health (including dental health) is important for overall wellbeing. Without it, general quality of life and the ability to eat, speak and socialise is compromised, resulting in pain, discomfort and embarrassment. Poor oral health is also associated with other health problems such as stroke, cardiovascular disease and adverse pregnancy outcomes (COAG Health Council 2015).

In 2011, poor oral health (mainly tooth decay, gum disease and tooth loss) contributed 4.4% of the non-fatal burden of disease in Australia.

### How common is poor oral and dental health?

Ha et al. (2016) reported that the National Child Oral Health Study 2012–14, which included a clinical examination component, found that:

- about 2 in 5 (42%) children aged 5–10 had experienced decay in their primary (baby) teeth and more than 1 in 4 (27%) had untreated decay in these teeth
- almost 1 in 4 (24%) children aged 6–14 had experienced decay in their permanent teeth, and more than 1 in 10 (11%) had untreated decay in these teeth.

The National Survey of Adult Oral Health 2004–06, which included a clinical examination component, showed that for people aged 15 and over:

- more than 1 in 4 (26%) had untreated tooth decay
- almost 1 in 4 (23%) had moderate or severe gum disease, which increased to more than 1 in 2 (53%) among people aged 65 and over.

#### Proportion of people with untreated tooth decay



(a) Data are for 2012–14.

(b) Data are for 2004–06.

Sources: AIHW: Chrisopoulos et al. 2016; Ha et. al. 2016.

The National Dental Telephone Interview Survey 2013 (based on self-reported information) found that, for people aged 15 and over, 1 in 20 (4.4%) had no natural teeth, including 1 in 5 (19%) people aged 65 and over. Dentate people (people who had at least one natural tooth) had 5 missing teeth on average, rising to 11 missing teeth for dentate people aged 65 and over. For dentate people:

- 1 in 7 (16%) had experienced toothache within the previous year
- 1 in 5 (20%) avoided eating certain foods because of oral health problems within the previous year
- 1 in 4 (27%) felt uncomfortable with their dental appearance.

## Use of dental health services

Brennan et al. (2016) reported that the National Child Oral Health Study 2012–14 found that for children aged 5–14:

- 1 in 10 (11%) had never visited a dentist
- 81% had visited a dentist in the 12 months before the survey
- 57% last attended a private dental service.

The 2016–17 Patient Experience Survey found that, in the last 12 months, for people aged 15 and over:

- 48% saw a dental professional. The proportion who visited a dentist in the last 12 months was lowest for people aged 25–34 (34%) and highest for people aged 55–64 (53%)
- 17% who reported that they needed to visit a dentist, had not done so (ABS 2017).

The National Dental Telephone Interview Survey 2013 found for people aged 15 and over:

- almost half (44%) had favourable (proactive) dental visiting patterns (visiting at least once a year for a check-up rather than a problem)
- 4 in 5 (84%) dental visits were made to a private dental practice
- 1 in 3 (35%) dentate people delayed or avoided going to the dentist due to cost; this was an increase from 25% in 1994.

Almost \$10 billion was spent on dental services in Australia in 2015–16. The majority (58%) of this cost was paid by patients directly, with individuals spending an average of \$239 on dental services over the 12-month period (see Chapter 2.2 'How much does Australia spend on health care?' for more information).

As well as visits to dental professionals, there were more than 67,000 potentially preventable hospitalisations for dental conditions in 2015–16, accounting for 80,000 bed days. Adjusting for age, the rate of potentially preventable hospitalisations for dental conditions increased between 2013–14 and 2015–16, from 279 to 284 separations per 100,000 people.

## What is missing from the picture?

There are limited routinely collected data on oral health status, as the surveys noted in this snapshot are conducted relatively infrequently. There is also limited information about dental services provided in Australia, especially in relation to those provided in the private sector.

Some national data are routinely collected from public dental services, but they are not currently nationally comparable and focus only on waiting times for some adult patients. Further, they do not cover reasons for, and the nature and outcomes of, public sector dental care provision.

## Where do I go for more information?

More information is available on the AIHW website at [Dental and oral health](#). The following report is available for free download: [Oral health and dental care in Australia: key facts and figures 2015](#).

## References

- ABS (Australian Bureau of Statistics) 2017. Patient experiences in Australia: summary of findings, 2016–17. ABS cat. no. 4839.0. Canberra: ABS.
- AIHW (Australian Institute of Health and Welfare): Chrisopoulos S, Harford JE & Ellershaw A 2016. Oral health and dental care in Australia: key facts and figures 2015. Cat. no. DEN 229. Canberra: AIHW.
- Brennan DS, Ju X, Amarasena N, Dooland M, Peres KG, Mejia GC et al. 2016. Patterns of dental services use by Australian children. In: Do LG & Spencer AJ (eds). Oral health of Australian children: the National Child Oral Health Study 2012–14. Adelaide: University of Adelaide Press.
- COAG Health Council 2015. Healthy mouths, healthy lives: Australia's National Oral Health Plan 2015–2024. Adelaide: SA Dental Service.
- Ha DH, Roberts-Thomson KF, Arrow P, Peres KG & Do LG 2016. Children's oral health status in Australia, 2012–14. In: Do LG & Spencer AJ (eds). Oral health of Australian children: the National Child Oral Health Study 2012–14. Adelaide: University of Adelaide Press.

## 3.19 Communicable diseases

Communicable diseases are caused by infectious agents and can be passed from one person or animal to another. Transmission can occur directly (through contact with bodily discharge), indirectly (for example, by sharing a drinking glass) or by vectors (such as mosquitoes). These diseases are caused by bacteria, viruses, parasites or fungi or their toxic products. Examples include malaria, influenza and chicken pox.

Throughout the 1900s, improved sanitation and new prevention and treatment options drastically reduced the burden of communicable diseases. Vaccination is a key preventative measure and has been highly successful in reducing infections from serious diseases such as polio and measles (see chapters 7.1 'Health promotion'; 7.2 'Immunisation and vaccination').

Although the total burden of communicable diseases in Australia is relatively small (1.6%), they are an important cause of ill health. Many have the potential to cause serious illness and outbreaks. Some have developed resistance to antimicrobial agents, increasing the risk of more lengthy and complex treatment and poor outcomes (ACSQHC 2017).

### How common are communicable diseases?

Most people will experience an infection with a communicable disease during their lifetime—for example, a common cold or a stomach bug. Mostly, the illness is mild and short lived and medical care is not needed or sought. The prevalence of many communicable diseases is therefore difficult to determine. However, certain diseases have to be reported to health authorities (Box 3.19.1); this requirement ensures that a consistent and comparable data set is collected over time, providing information about who is affected.

#### Box 3.19.1: Notifiable diseases

Notifiable diseases are a subset of communicable diseases. Legislation requires that each detected case is reported to state and territory health departments. Notification means that trends in the number and characteristics of cases can be monitored over time and outbreaks can be detected promptly. This enables interventions to be implemented to prevent or reduce transmission. Monitoring, analysis and reporting on notifiable diseases occurs nationally via the National Notifiable Disease Surveillance System (NNDSS).

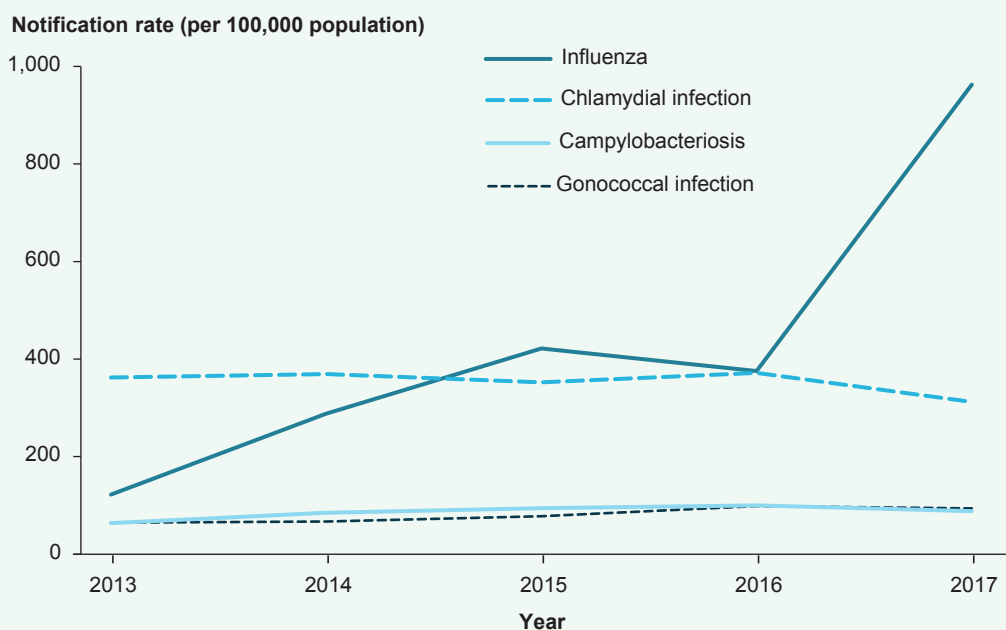
More than 500,000 cases of notifiable diseases were reported to the NNDSS in 2017. The most commonly notified diseases were:

- laboratory-confirmed influenza (a respiratory infection) (around 250,000 notifications)
- chlamydial infection (a sexually transmitted infection) (around 96,700 notifications)
- gonococcal infection (a sexually transmitted infection, also called gonorrhoea) (around 28,400 notifications)
- campylobacteriosis (a gastrointestinal infection) (around 26,700 notifications) (Figure 3.19.1).

In 2017, influenza activity in Australia was high, although it varied between states and territories. Overall, the reported numbers of notifications, people seeking care at primary care providers and hospitals, and hospital admissions were the most since the 2009 pandemic year. However, the 2017 season was not characterised by greater severity; both the number of people admitted to intensive care, and the mortality associated with influenza were within the normal range, considering the large number of notified cases and the main type of influenza causing illness (influenza A (H3N2)). It is difficult to identify specific causes for the high level of influenza activity; however, in eastern states and territories, the season began 1 month earlier and the high point of activity lasted longer compared with patterns for previous years (Department of Health 2017a).

The extent of under-notification and trends in notifications of communicable diseases can change if patients become more likely to seek medical care for infection or screening, if the number of laboratory tests requested by health practitioners increases, or if laboratory tests become more sensitive. For example, it is possible that increased rapid testing contributed, in part, to a dramatic increase in influenza notifications in 2017 compared with 2016 (Department of Health 2017b). The rise in the chlamydia and gonorrhoea notification rate over time was associated with the gradual introduction of more sensitive laboratory tests and an increased number of tests being performed (Kirby Institute 2017; Figure 3.19.1).

**Figure 3.19.1: Notification rates for selected notifiable diseases, 2013–2017**



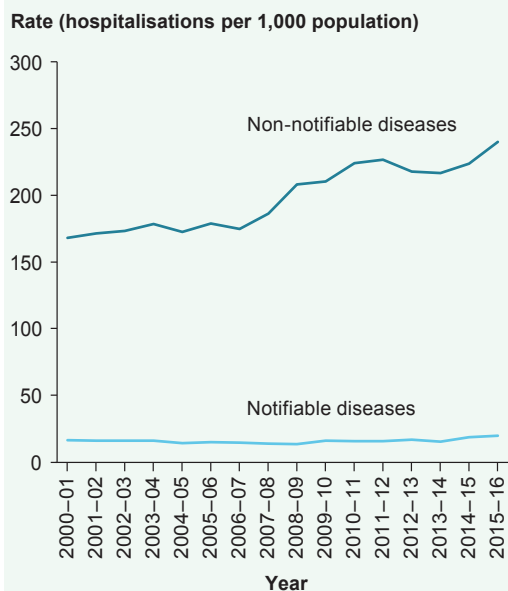
Source: Department of Health 2018; Table S3.19.1.

## Hospitalisations and deaths

Some people who become infected with communicable diseases end up with a severe infection, resulting in hospitalisation. In 2015–16, 93% of the nearly 400,000 hospitalisations for communicable diseases were for non-notifiable diseases (Supplementary Table S3.19.1). The hospitalisation rate for non-notifiable communicable diseases increased by 43% since 2000–01, to 240 per 1,000 population in 2015–16 (more than 372,000 hospitalisations). The most common diagnosis was lower respiratory tract infections (such as pneumonia and bronchitis), accounting for almost 143,000 hospitalisations (36%) in 2015–16. Of the nearly 28,000 hospitalisations for notifiable diseases, influenza was the most common diagnosis associated with hospitalisation (10,800, 38%). The hospitalisation rate per 1,000 population for notifiable communicable diseases ranged between 13 in 2007–08 and 20 in 2015–16 (Figure 3.19.2a).

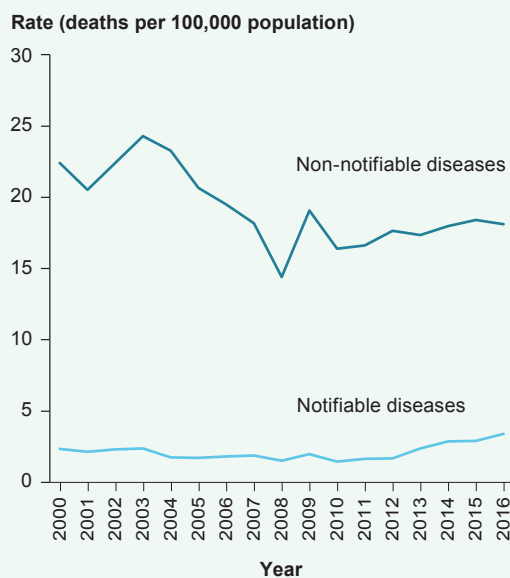
In 2015, slightly more than 6,300 deaths were attributed to communicable diseases. The majority of deaths occurred in people aged over 65 and were caused by non-notifiable lower respiratory infections. The death rate per 100,000 population due to non-notifiable communicable diseases ranged between 14 in 2008 and 24 in 2003 (Figure 3.19.2b). Of the 800 deaths attributed to notifiable diseases between 2000 and 2015, the most common diagnoses were influenza (282) and chronic hepatitis C infection (225).

**Figure 3.19.2a: Age-standardised hospitalisations rates for notifiable and non-notifiable communicable diseases, 2000–01 to 2015–16**



Source: National Hospital Morbidity Database; Table S3.19.1.

**Figure 3.19.2b: Age-standardised mortality rates for notifiable and non-notifiable communicable diseases, 2000–2016**

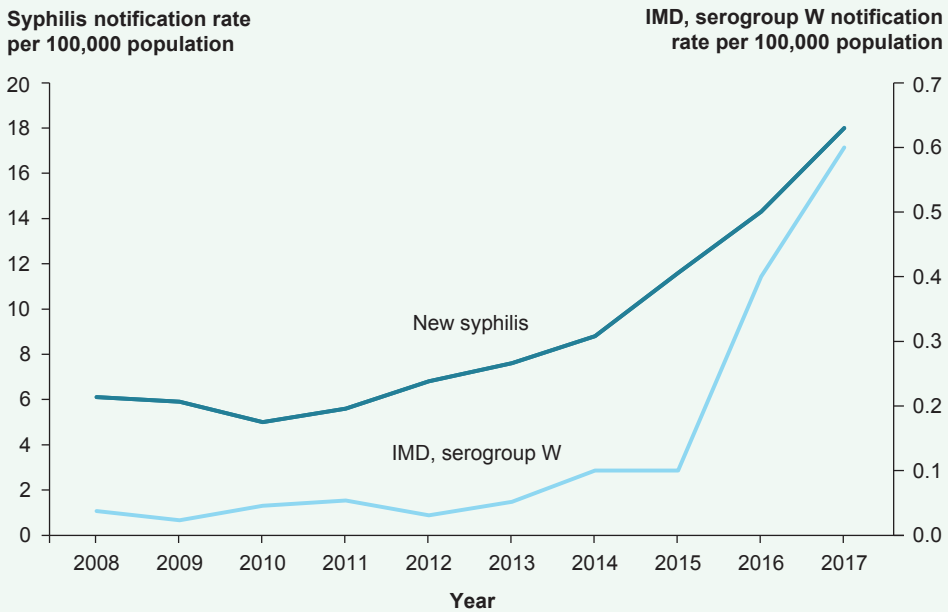


Source: National Mortality Database; Table S3.19.1.

# Selected outbreaks of communicable diseases in 2017

The notification system in Australia enables public health authorities to detect outbreaks and increases in communicable diseases. Many outbreaks occur each year—such as widespread seasonal outbreaks of influenza or localised outbreaks of diseases transmitted through, for example, consumption of contaminated food. Of interest because of their severity, ongoing nature, geographic spread and impact on Aboriginal and Torres Strait Islander people are outbreaks of invasive meningococcal disease (IMD) and infectious syphilis, shown for the period 2008–2017 in Figure 3.19.3.

**Figure 3.19.3: Notification rates for new syphilis infections and invasive meningococcal disease, serogroup W, 2008–2017**



Source: Department of Health 2018; Table S3.19.3.

## Invasive meningococcal disease, type W

There are five main types of IMD—caused by types ('serogroup') A, B, C, W and Y. A national immunisation program against serogroup C (MenC) was introduced in 2003 in response to an increase in notified cases, particularly among adolescents and young adults. Between 2003 and 2014, the rates of IMD infection declined, with most cases infected with serogroup B. However, in 2014, the number of IMD cases caused by serogroup W (MenW) began to increase, with 17 cases reported. MenW was the predominant cause of IMD in 2016, with 108 cases reported.

Cases are scattered around Australia, but the impact on Indigenous Australians has been comparatively greater (compared with Other Australians), particularly in central Northern Territory. As at 31 December 2017, there were 140 MenW cases reported in 2017; it was the predominant serogroup causing IMD infections. The notification rate in 2017 among Indigenous Australians was 7.0 cases per 100,000, compared with 0.4 cases per 100,000 among other Australians (Department of Health 2017c). Relevant state and territory governments responded to increased cases of MenW by funding targeted vaccination programs in areas affected or linked by cultural and geographical ties, using combination ACWY vaccines.

## Syphilis

Syphilis is a sexually transmitted infection. Left untreated, it can irreversibly damage the brain, nerves, eyes, heart, spinal cord and joints, causing serious illness and possibly death. Pregnant women can pass the infection to their baby, increasing the chance of stillbirth. Syphilis can be prevented through safe sexual practices or treated with antibiotics.

Since January 2011, an ongoing outbreak of new syphilis infections has affected Indigenous Australians living in rural and remote areas of northern and central Australia. Around 1,950 cases have been associated with this outbreak (as at 31 January 2018) (Department of Health 2017d), of which around two-thirds were people aged 15–29. Responses to the outbreak have included increased screening, public health alerts, an Indigenous-specific public awareness campaign and active follow-up of cases. In parallel, there have been increases in cases of new syphilis reported in men who have sex with men, predominantly aged 20–39, living in urban areas of Victoria and New South Wales.

## What is missing from the picture?

Notifications of notifiable communicable diseases to the NNDSS represent only a portion of all the cases occurring in the community. This is because not all individuals with notifiable diseases present for medical care and, of people who do, not all are tested and/or notified. The proportion of under-reporting may vary between diseases, over time, and across jurisdictions. The number of notifications may be influenced over time by changes in testing practices; for example, by an increased propensity to test and/or to use more sensitive diagnostic tests. These changes may be influenced by both clinician practice and patient expectations. For non-notifiable communicable diseases, the number of cases requiring hospitalisation is a small fraction of the total number of cases occurring in the community. It is difficult to estimate with any certainty what the total number of cases might be.



## Where do I go for more information?

More information about the selected outbreaks of communicable diseases in Australia in 2017 can be found here:

- MenW outbreak <[www.health.gov.au/internet/main/publishing.nsf/Content/ohp-meningococcal-W.htm](http://www.health.gov.au/internet/main/publishing.nsf/Content/ohp-meningococcal-W.htm)>
- syphilis outbreak: <[www.health.gov.au/internet/main/publishing.nsf/Content/ohp-infectious-syphilis-outbreak.htm](http://www.health.gov.au/internet/main/publishing.nsf/Content/ohp-infectious-syphilis-outbreak.htm)>
- influenza season: <[www.health.gov.au/internet/main/publishing.nsf/Content/cda-surveil-ozflu-flucurr.htm](http://www.health.gov.au/internet/main/publishing.nsf/Content/cda-surveil-ozflu-flucurr.htm)>
- links for further information on other notifiable diseases: <[www.health.gov.au/cda](http://www.health.gov.au/cda)>.

## References

ACSQHC (Australian Commission on Safety and Quality in health Care) 2017. AURA 2017: second Australian report on antimicrobial use and resistance in human health. Sydney: ACSQHC.

Department of Health 2017a. 2017 influenza season in Australia: a summary from the National Influenza Surveillance Committee. Canberra: Department of Health. Viewed December 2017, <[http://www.health.gov.au/internet/main/publishing.nsf/Content/097F15A91C05FBE7CA2581E20017F09E/\\$File/2017-season-summary-22112017.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/097F15A91C05FBE7CA2581E20017F09E/$File/2017-season-summary-22112017.pdf)>.

Department of Health 2017b. Australian influenza surveillance report. No. 12, 2017, 14–27 October. Canberra: Department of Health. Viewed December 2017, <[http://www.health.gov.au/internet/main/publishing.nsf/Content/8FC4EA9E4C6E3F5CCA2581D4001BBC9A/\\$File/ozflu-surveil-no12-2017.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/8FC4EA9E4C6E3F5CCA2581D4001BBC9A/$File/ozflu-surveil-no12-2017.pdf)>.

Department of Health 2017c. Invasive meningococcal disease: national surveillance report—with a focus on MenW3. December 2017. Canberra: Department of Health. Viewed February 2018, <[http://www.health.gov.au/internet/main/publishing.nsf/Content/5FEABC4B495BDEC1CA25807D001327FA/\\$File/31-Dec17-IMD-Surveillance-report.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/5FEABC4B495BDEC1CA25807D001327FA/$File/31-Dec17-IMD-Surveillance-report.pdf)>.

Department of Health 2017d. Multijurisdictional syphilis outbreak working group (MJSO), meeting communique. 22 February 2018. Canberra: Department of Health. Viewed February 2018, <[http://www.health.gov.au/internet/main/publishing.nsf/Content/71E8A32E7518E532CA25801A0009A217/\\$File/Feb-2018-communique.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/71E8A32E7518E532CA25801A0009A217/$File/Feb-2018-communique.pdf)>.

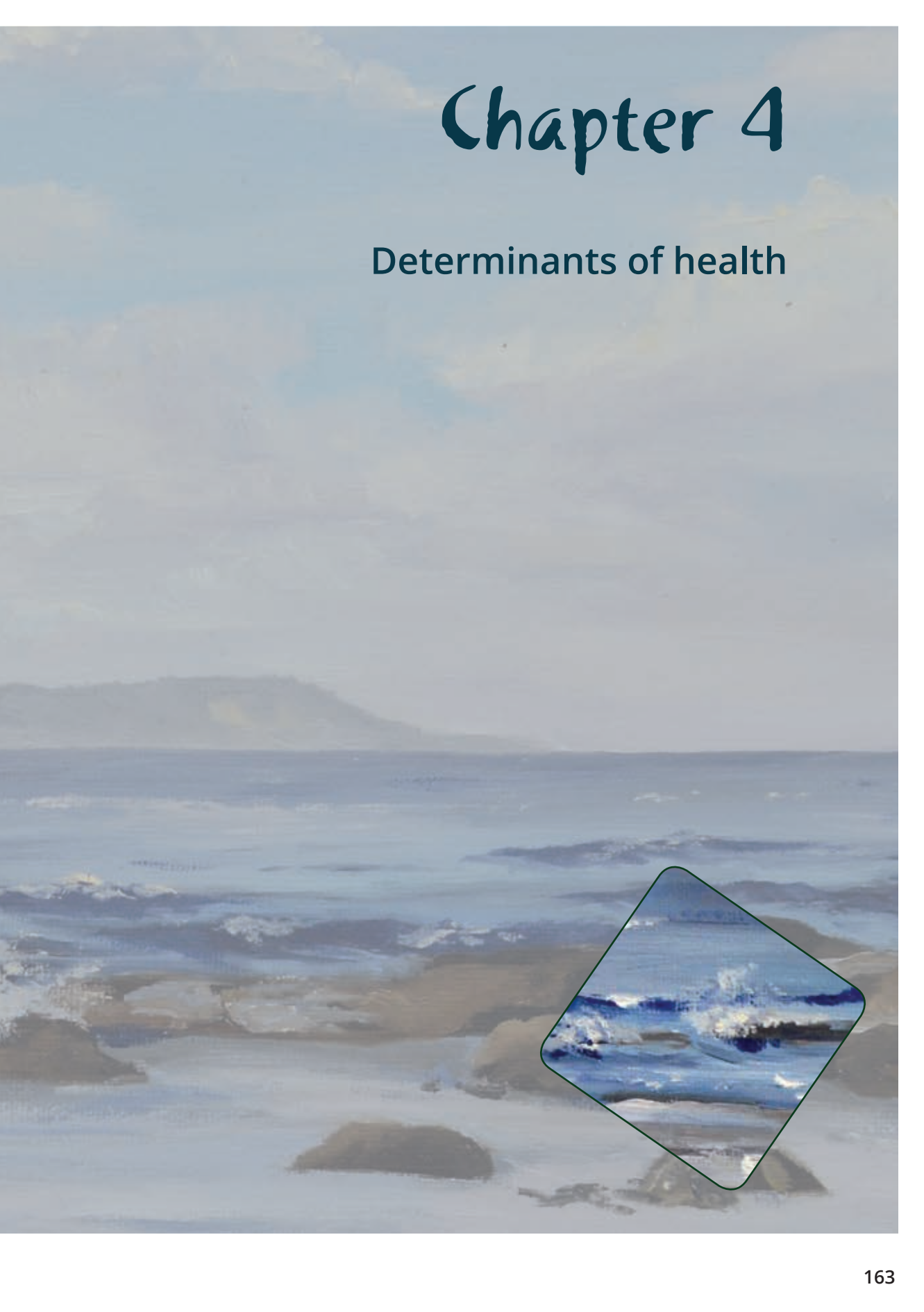
Department of Health 2018. National notifiable diseases surveillance system, 2018. Canberra: Department of Health. Viewed January 2018, <[www.health.gov.au/nndssdata](http://www.health.gov.au/nndssdata)>.

Kirby Institute 2017. HIV, viral hepatitis and sexually transmissible infections in Australia: annual surveillance report 2017. Sydney: Kirby Institute, University of New South Wales.



# Chapter 4

## Determinants of health



## 4.0 Overview

A person's health and wellbeing is influenced by individual, societal and socioeconomic factors. This chapter focuses on these 'determinants of health' or 'risk factors', which combine to affect the health of individuals and communities. They include broad features of society and environment; socioeconomic characteristics; a person's knowledge, attitudes and beliefs; health behaviours; psychological factors; safety factors; and biomedical factors.

Determinants can affect health positively or negatively—they are attributes, characteristics or exposures that increase or decrease the likelihood that a person develops a disease or health disorder. Many risk factors can be changed or controlled to improve health outcomes or to reduce the chance of ill health. In turn, a person's health status influences social and socioeconomic factors; for example, their ability to work, earn an income or participate in their community.

The natural environment is one factor that can affect our physical and mental health. This includes the quality of air and water, the positive and negative health effects of exposure to ultraviolet radiation (adequate exposure can guard against Vitamin D deficiency, while excessive exposure has been linked to various types of skin cancer), and the potential impact of extreme weather events. For example, there have been several 'thunderstorm asthma' events in Australia in recent years, with the event in Victoria in 2016 resulting in 9 deaths.

Many key drivers of health are integral to our everyday living and working conditions—the circumstances in which we grow, live, work and age. One of these social determinants is socioeconomic position, which can be described in terms of educational attainment, income level, and occupational status. In general, every step up the socioeconomic ladder has a corresponding benefit for health. It is estimated that closing the health gap between the most and least disadvantaged Australians would spare around half a million people from chronic illness.

What we know about health and health behaviours can influence how much and how effectively we engage in looking after our own health; however, based on the 2006 Australian Bureau of Statistics Health Literacy Survey, only 4 in 10 (41%) adults have a level of health literacy that allows them to meet the complex demands of everyday life.

Many chronic conditions share common risk factors that are largely preventable, such as tobacco smoking, excessive alcohol consumption, overweight and obesity, physical inactivity and high blood pressure. Almost one-third of the overall disease burden in Australia could be prevented by reducing exposure to modifiable risk factors. Small personal lifestyle changes can have big health gains for the whole population—if we all did an extra 15 minutes of brisk walking, 5 days a week, Australia's disease burden due to physical inactivity would be cut by about 14%.

Fewer Australians are smoking than ever before—and 62% of the population have never smoked—but the decline in smoking rates has slowed, with no decline seen between 2013 and 2016. Tobacco use continues to be the single risk factor causing the most disease burden in Australia, with the largest impact from tobacco use on cancer, respiratory diseases and cardiovascular diseases.

As well, fewer Australians are drinking at levels that contribute to alcohol-related harm over a lifetime. However, about 26% of people drink more than is recommended on a single occasion, and they do this at least once each month. Younger people show more promising trends when it comes to alcohol—fewer people aged 12–17 are drinking and a greater proportion are abstaining from drinking altogether.

In 2016, Australia recorded the highest number of drug deaths seen in 20 years (1,800 deaths). Hospitalisations associated with illicit drug use have been increasing over the last 5 years, reaching 57,900 in 2015–16 (from 38,200 in 2011–12).

Eating a healthy diet reduces the risk of diet-related conditions and can protect against associated chronic conditions such as type 2 diabetes. However, the eating habits of many Australians do not meet recommended dietary guidelines. For example, about 99% of children, 97% of men and 95% of women do not consume the recommended serves of vegetables, and more than two-thirds (69%) of children and almost half (47%) of adults exceed the recommended intake of free sugars (they should account for less than 10% of energy).

Together with eating a healthy diet, getting enough exercise can reduce the risk of many chronic conditions and other disease risk factors, such as overweight and obesity, and high blood pressure. Despite this, 92% of young people aged 13–17, 52% of adults aged 18–64 and 75% of adults aged 65 and over are not doing the recommended amount of exercise for their age each week.

Almost two-thirds (63%) of Australian adults are overweight or obese. The prevalence has increased over time. Of particular concern, is the growing rate of severe obesity, which almost doubled between 1995 and 2014–15 among adults.

Elevated blood pressure and blood lipids are linked to disease risk. Slightly more than 1 in 3 (6 million) Australian adults have high blood pressure, and almost 2 in 3 (8.4 million) have abnormal blood lipid levels.

# 4.1 Impacts of the natural environment on health

The health of the Australian population is linked to the state (or health) of our natural environment—the air we breathe, the water we drink and bathe in, and the soils our food grow in (EPA Victoria 2017). The Department of Health uses the World Health Organization's (WHO's) definition of environmental health:

Environmental health addresses all the physical, chemical, and biological factors external to a person, and all the related factors impacting behaviours. It encompasses the assessment and control of those environmental factors that can potentially affect health. It is targeted towards preventing disease and creating health-supportive environments (WHO 2017b).

This article presents a selection of evidence on the impact of the 'natural environment' on the physical and mental health of Australia's population (Box 4.1.1). It also describes government policies and community programs currently in place in Australia to prevent and manage ill health that is related to the natural environment.

## Box 4.1.1: What is meant by the 'natural environment'?

The meaning of the word 'environment' is very broad. Essentially, our environment is made up of all the external elements that surround, influence and affect life. One way to view it is to see it as two interlinked domains: the 'natural environment' and the 'built environment'.

The 'natural environment' can be classified as all the landscapes, habitats (on land, and in the air and water) and species on earth, and the 'built environment' as everything made by people (AIHW 2012). The natural environment can be positively and negatively affected by human intervention and impact. It, in turn, can positively and negatively affect people and their physical and mental health.

## What is the current state of the natural environment and its effect on human health?

Most Australians have access to clean drinking water, safe food products, and effective waste collection and sanitation. However, factors such as population growth and distribution, extreme weather events and climate change (see Box 4.1.2) place increasing pressure on Australia's natural environment. This may, in turn, adversely affect the health of its population.

Australia's population is steadily increasing. The population of 22.7 million as at June 2012 is projected to increase to between 36.8 and 38.3 million by 2061—in September 2017, the population sat at around 24.7 million (ABS 2013; ABS 2017). This growth and the changing geographical distribution of the population are placing increasing pressure on the natural environment. The growing concentration of people in urban areas, particularly in south-eastern cities and coastal regions, has led to increased land clearing and construction of further infrastructure such as water and sewerage facilities (ABS 2014b).

## Air quality

Air becomes polluted when it contains gases, particles, dust or fumes in amounts considered harmful to humans and animals, or damaging to plants and natural materials. Pollutants emitted directly into the atmosphere, from either natural sources or human sources such as factories and cars, are called primary pollutants (organic compounds and nitrogen oxide are two such pollutants); they can undergo chemical changes in the atmosphere to form secondary pollutants such as ozone (Keywood et al. 2016).

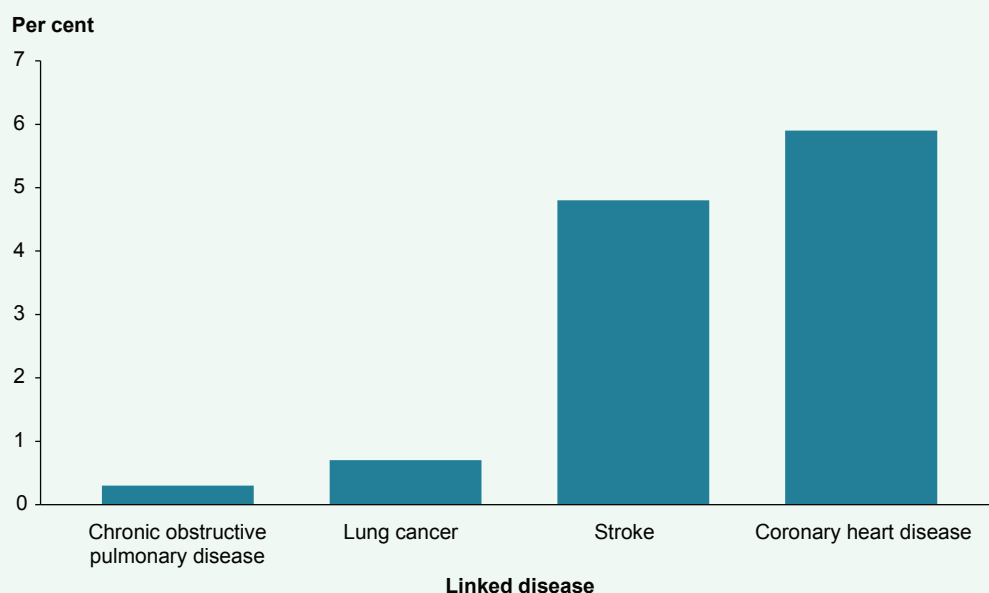
Long-term exposure to air pollution increases the risk of morbidity and mortality from cardiovascular disease and respiratory diseases (particularly asthma) (WHO 2013). Barnett et al. (2005) demonstrated that exposure to air pollutants was associated with short-term increases in respiratory hospitalisations for children aged 0–14, while a study by Bowatte et al. (2017) found a strong correlation between traffic-related air pollution and an increased risk of asthma, wheezing and worsening lung function.

Australia has national air quality standards, known as the National Environment Protection Measure for Ambient Air Quality. These standards set the acceptable levels of key pollutants, which are monitored across 75 sites across all states and territories.

Compared with many other developed countries, Australia has very clean air (OECD 2017). All its capital cities have very good air quality, based on assessment of PM<sub>2.5</sub> (fine particulate matter less than 2.5 microns in diameter) (see also Chapter 9.2 of *Australia's Welfare 2017*). Further, the landmark report *Australia: State of the Environment 2016* notes that Australia's air quality is improving, with declining levels of lead and nitrogen dioxide since 2011 (Keywood et al. 2016). This positive trend aside, there is no safe lower threshold for health impacts, and continued improvement in air quality will result in continued population health benefits (Broome et al. 2015; Pope & Dockery 2006).

The Australian Burden of Disease Study (ABDS) 2011 reported that 1.3% of all fatal burden, 5.9% of the fatal burden due to coronary heart disease and 4.8% of the fatal burden due to stroke was attributable to air pollution (AIHW 2016a; Figure 4.1.1). (See Box 4.4.1 in Chapter 4.4 'Contribution of selected risk factors to burden of disease' for more information on burden of disease and definitions on fatal and non-fatal burden.)

**Figure 4.1.1: Fatal burden of disease attributable to air pollution, by linked disease, 2011**



Source: AIHW 2016a; Table S4.1.1.

Climate change and extreme weather events (see section 'Extreme weather events' later in this article) are increasing our population's exposure to air pollution. Ozone formation increases in warmer weather. Increasing fire weather drives more bushfires and fuel reduction burns, which increase the population's exposure to episodes of severe air pollution. One such example was the hazard reduction burning that took place near Sydney in May 2016; it is estimated to have caused 14 deaths and 87 admissions to hospital for heart and lung conditions (Broome et al. 2016).

## Water quality

Water quality relates to the physical, chemical and biological properties of water, including colour, clarity, salinity, acidity, chemical contaminants (such as pesticide residues and heavy metals) and microbial contaminants (such as bacteria, viruses and protozoa). Most water sources in Australia need some treatment, or ongoing management, to ensure that they are safe for human consumption or recreational activity. The effects on human health of contaminated water may include skin and eye irritation, and conditions such as gastroenteritis (including infections like giardiasis and cryptosporidiosis).

States and territories are largely responsible for managing water supplies and achieving optimal water quality as defined in the Australian Drinking Water Guidelines 2011. The Bureau of Meteorology reported that, in 2015–16, the average proportion of the population where microbiological compliance was achieved was almost 100% (Bureau of Meteorology 2017).



While some water treatment practices remove disease-causing organisms, others fortify water sources to prevent disease, such as fluoridation to prevent tooth decay. Fluoride occurs naturally in water, but at levels below those set out in the current guidelines to prevent and manage tooth decay, particularly among children and people with limited access to dental services (NHMRC 2017b). Optimum levels of water fluoridation are achieved by adding fluoride to the drinking water supply—a practice that has been occurring in parts of Australia for over 60 years—and is the responsibility of local councils in cooperation with state and territory governments. In 2016, the National Health and Medical Research Council (NHMRC) reported that water fluoridation in Australia reduces tooth decay by between 26–44% in children and adolescents and 27% in adults (NHMRC 2017a).

## Food safety

Food is a vital feature of the natural environment. It is declared unsafe when its contamination is likely to physically harm a person who consumes it. Some food is contaminated through exposure to microbes, chemicals, biotoxins and other pollutants in the air, water or soil. Contamination can also occur when foods are not correctly handled before consumption, such as during production, packaging and preparation.

When unsafe food is consumed, people commonly develop symptoms of gastroenteritis. *Campylobacteriosis* (caused by the *Campylobacter* bacterium) is the most commonly notified gastrointestinal disease in Australia, followed by salmonellosis (caused by the *Salmonella* bacterium). In Australia, foodborne illness is common—in 2017, around 16,400 cases of salmonellosis and 26,700 cases of campylobacteriosis were reported in the National Notifiable Diseases Surveillance System, although it is not known how many of these cases resulted from the consumption of unsafe food (Department of Health 2018). In 2016–17, there were 61 food recalls conducted by Food Standards Australia New Zealand in response to the consumption of potentially unsafe food. Of these, microbiological, chemical or biotoxin contamination was the cause in 14% of the recalls (FSANZ 2017). A study by Kirk et al. (2014) showed that unsafe food was responsible for an estimated 4.1 million cases of foodborne gastroenteritis, more than 30,800 hospitalisations and nearly 100 deaths in Australia in 2010.

The ABDS 2011 reported that gastrointestinal infections (including campylobacteriosis, salmonellosis, rotavirus and other gastrointestinal infections) accounted for 41% of the non-fatal infectious burden and 3.8% of the fatal infectious disease burden (AIHW 2016a).

## Ultraviolet radiation: sun exposure, Vitamin D and skin cancer

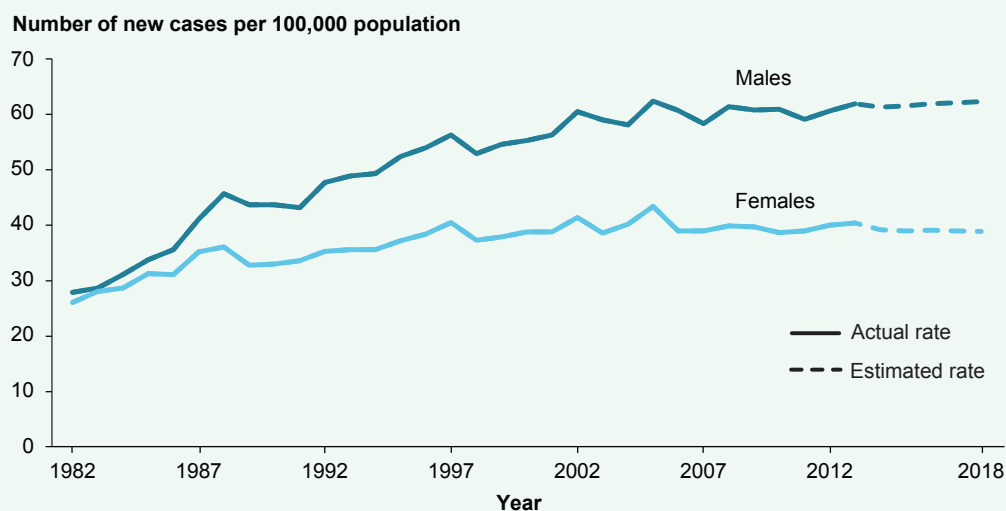
Compared with other countries, Australia has a high level of solar ultraviolet (UV) radiation (Olsen et al. 2015). UV radiation can both positively and negatively affect a person's health—adequate exposure to UV radiation can guard against Vitamin D deficiency and reduce the risk of chronic musculoskeletal conditions (Lucas et al. 2006), while excessive exposure has been linked to various types of skin cancer.

In Australia, adequate blood levels of Vitamin D are considered to be greater than or equal to 50 nmol/L; however, in 2011–12, 23% of Australian adults (or 4 million people) had a Vitamin D deficiency (ABS 2014a). Low levels of Vitamin D are associated with an increased risk of osteoporosis through increased risk of falls in older Australians, and bone and joint pain; low levels in women can also affect the levels of Vitamin D in unborn children (Joshi et al. 2010; Osteoporosis Australia 2017).

Excessive exposure to UV radiation—either from the sun, or by other means such as tanning and solariums (which emit cancer-causing UVA and UVB radiation)—is the main risk factor for skin cancer (AIHW 2016a; Cancer Council Australia 2018). Melanoma is the most common skin cancer reported as cause of death (of all skin cancers) (AIHW 2017). The ABDS reported that high sun exposure, as an environmental risk factor, accounted for 0.8% of total burden of disease and injury in 2011, due to melanoma and non-melanoma skin cancers (AIHW 2016a). In 2016, there were an estimated 13,300 new cases of melanoma, which accounted for 10% of all cancers diagnosed that year (excluding basal cell carcinoma and squamous cell carcinoma) (AIHW 2016b).

While the rate of new diagnoses of melanoma increased between 1982 and 2006 (from 28 to 61 cases per 100,000 population for males and 26 to 39 cases per 100,000 for females), rates have remained relatively steady since 2006 (Figure 4.1.2). This stabilisation may be due in part to increased awareness of the risks of excessive sun exposure through long-running education campaigns (see section 'How are we managing the impact of the natural environment on human health?').

**Figure 4.1.2: Trend in age-standardised incidence rates for melanoma, by sex, 1982–2018**



*Notes*

1. Cancer coded in the International Classification of Diseases and Related Health Problems, 10th revision (ICD-10) as C43.
2. The rates were age standardised to the Australian population as at 30 June 2001, and are expressed per 100,000 population.
3. The 2014–2018 estimates for incidence are based on 2004–2013 incidence data.

Source: AIHW 2017; Table S4.1.2.

## Extreme weather events

'Extreme weather events' are classified as unusual weather events or phenomena that are at the extremes of a 'typical' historical distribution, such as violent storms, exceptionally high levels of rainfall, and heat waves or droughts that are longer or hotter than is typical. Extreme weather events often have substantial social and economic impacts and may be hazardous to human life. Resulting health effects may be immediate and physical (such as death and injury due to bushfires), short term (for example, loss of shelter or access to clean water due to cyclone or floods) or long term (such as mental health problems or chronic injury) (Morrissey & Reser 2007).

### Thunderstorm asthma

'Thunderstorm asthma' is defined as asthma triggered by an uncommon combination of high pollen and a particular type of thunderstorm, during which pollen grains are swept into the clouds as the storm forms (Asthma Australia 2017). Several thunderstorm asthma events have been reported in Australia in recent years—Wagga Wagga in 1997, Canberra in 2010, and Victoria in 2016 (Victorian Department of Health and Human Services 2017b). The Victorian event was the most noteworthy of these events on record. It resulted in a 58% increase in presentations to public hospital emergency departments on 21–22 November 2016 (9,900 compared with a previous 3-year average of 6,300) and 9 deaths (Victorian Department of Health and Human Services 2017b).

### Heatwaves

A heatwave is defined as 3 or more days of high maximum and minimum temperatures that are unusual for a location and are monitored by the Bureau of Meteorology. It is expected that extreme heat events, such as heatwaves, will occur more often and with greater intensity in the future (Bureau of Meteorology 2018). Understanding the health impacts of heatwaves is important in Australia (Tong et al. 2010). Potential conditions resulting from heatwaves range from minor rashes and body cramps, through to those that require hospitalisation and sometimes result in death, such as heat stroke (severe hyperthermia). A report by the WHO stated that heat related deaths in Australasia attributable to climate change are predicted to increase from 217 in 2030 to 605 in 2050, based on the current climate (WHO 2014).

The Victorian Department of Health and Human Services (2009) reported a 62% increase in deaths during a heatwave period from 26 January to 1 February 2009, compared with the average number of deaths for the same week between 2004–08.

### Bushfires

The frequency and intensity of bushfires is increasing in Australia (Dutta et al. 2016); it is important, therefore, to understand the effects of these events on human health and ways to mitigate these effects (Johnston 2017). Numerous studies have described the impact of bushfires on human health:

- Between 1967 and 2013, bushfires accounted for 433 deaths (173 alone during 'Black Friday' in 2009) and more than 8,000 injuries (Geoscience Australia n.d.; Parliament of Victoria 2010).

- Johnston et al. (2014) examined 46 validated fire smoke event days between 1996 and 2007 in Sydney, and found marked increases in same-day emergency department attendance—23% for asthma, 12% for chronic obstructive pulmonary disease and 7.0% for respiratory conditions, while Haikerwal et al. (2015) found a 7.0% increase in risk for out-of-hospital cardiac arrests during the 2006–07 Victorian bushfires.
- Bushfires increase the risk of burns, physical trauma such as injury from car accidents, psychological trauma such as post-traumatic stress, depression, substance abuse and domestic violence (Johnston 2009; McDermott & Palmer 1999; Yzermans et al. 2005).
- Severe bushfires also put population water reservoirs at risk (Johnston 2009) through silting up (loss of storage capacity), and through contamination from run-off and toxic algal blooms.

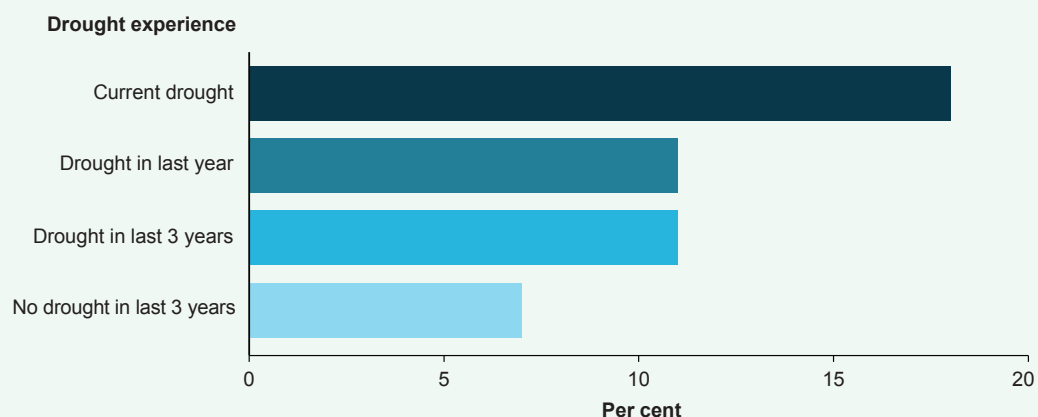
## Drought

Although some areas of Australia are naturally dry, periods of below-average rainfall, known as drought, have adverse outcomes for the natural environment, and flow-on effects for human health. Not only does drought reduce the supply and quality of water and food, it increases the probability of bushfires and affects air quality (for example, via dust storms) (Centres for Disease Control and Prevention 2017; Kalis et al. 2009).

Drought, rain following drought, and human adaptation to drought (in the form of water storage tanks) has also been shown to increase the risk of vector-borne (mosquito) disease, such as dengue fever and Ross River virus (Trewin et al. 2013).

Results from the Rural and Regional Families Survey showed that, in 2007, 18% of farmers currently experiencing drought reported mental health problems, compared with 11% who had experienced drought in the past year or past 3 years and 7.0% who had not experienced drought in the past 3 years (Edwards et al. 2008; Figure 4.1.3). Hanigan et al. (2012) found that increasing drought was associated with a 15% increased relative risk of suicide among men aged 30–49.

**Figure 4.1.3: Proportion of farmers reporting mental health problems, by drought experience, 2007**



Source: Edwards et al. 2008; Table S4.1.3.

### Box 4.1.2: Climate change and human health

Human activities, such as burning fossil fuels, agriculture and deforestation, have led to an increase in greenhouse gas (GHG) emissions, contributing to a phenomenon known as climate change (Department of the Environment and Energy n.d.d).

Between 1995 and 2005, Australia's GHG emissions increased from 24.2 to 25.8 tonnes of GHG per capita (OECD 2016). In 2007, Australia became a signatory to the Kyoto Protocol, an international agreement among nations to collaboratively reduce GHG emissions. Since then, Australia has reduced emissions by 13%, from 25.6 to 22.3 tonnes of GHG per capita (OECD 2016).

The WHO has reported that climate change is negatively affecting both social and environmental determinants of human health—access to clean air and safe drinking water and adequate food resources (WHO 2017a). Likely effects of climate change on the natural environment include increased temperatures (due to excess GHG in the atmosphere), changes to rainfall and wind patterns, and acidification of the oceans (Department of the Environment and Energy n.d.c).

Climate change is predicted to increase the risk of extreme weather events (Department of the Environment and Energy n.d.b). Further, research on climate change highlights a strong correlation between the frequency and intensity of extreme weather events and changes to the natural environment. These factors are likely to amplify the adverse impact of the natural environment on human health.

Changes to weather patterns (such as increased rainfall and tidal changes) are expected to increase disease vector populations such as mosquitoes, which, in turn, will lead to larger areas of disease transmission over longer durations (Garnaut 2008). While major vector-borne diseases such as dengue fever are currently not common in Australia, the predicted increase in temperatures and rainfall as a result of climate change has the potential to increase and change the geographic distribution of vector populations, and affect human infection rates (McMichael et al. 2006; Russell 1998).

## How are we managing the impact of the natural environment on human health?

Although Australia ranks highly in terms of environmental performance in a global context, the *Australia: State of the Environment 2016* report noted that, if current local trends continue, Australia's natural environment in 2050 will be markedly different from what it is today. The detrimental effects of climate change (such as rising temperatures and reduced precipitation), the reduction in the quality of Australia's groundwater resources, increased demands for land in coastal areas (placing increasing demands on resources) and potential threats to human health from extreme weather events and disease will have profound effects on the health of Australia's population (Jackson et al. 2017).

There are many areas where Australia's natural environment is predicted to improve because of current policies and programs; it is expected that these improvements will have a positive effect on human health. Examples of those initiatives currently in place at the national, state and local level—and their observed or predicted impact on human health—include:

- the National Clean Air Agreement, developed in 2015, which aims to reduce pollution and improve air quality through actions undertaken by the community and government at all levels. Actions include increasing the standards against which air particles are reported (Department of the Environment and Energy n.d.a). It is expected that ongoing improvements to air quality will reduce the level of respiratory disease and acute respiratory events
- the Australian Drinking Water Guidelines, which is a framework by which good management of water supplies assures safety at point of use, and which is reported against by the Bureau of Meteorology (Bureau of Meteorology 2017; NHMRC & NRMCC 2011). Improved reporting, improved sampling, and early detection and mitigation of problems have been shown to have a positive impact on water quality in New South Wales (Byleveld et al. 2016)
- a number of SunSmart campaigns, which have been enacted in Australia since the early 1980s to increase awareness of the dangers and health risks associated with UV radiation exposure. These campaigns have been shown to have a positive impact on the detection and diagnosis of melanoma and other skin cancers. Since the launch in 2007 of one of the most publicly recognised campaigns—Clare Oliver: No Tan is Worth Dying For—incidence rates of melanoma have stabilised (Figure 4.1.2).

See Chapter 7.1 'Health promotion' for more information on other health programs and policies.

In 2016, the Environmental Health Standing Committee (formed by the Australian Government and state and territory governments) developed a 2016–2020 Strategic Plan. The Plan highlighted the importance of anticipatory, integrated responses to changes in the natural environment that may affect health and of an early understanding of the risk factors that result from environmental variation—for example, the health impacts of changes to air and water quality and extreme weather events resulting from climate change (enHealth 2016).

Tracking and forecasting extreme weather events is one way to lessen the impact on human health by warning of forecasted weather events. This gives governments, communities and individuals a better chance to respond. For example:

- the Victorian State Government has been working with the Bureau of Meteorology to forecast the risk of thunderstorm asthma events (Victorian Department of Health and Human Services 2017a)
- the Sentinel National Bushfire Monitoring System provides 144 national observations per day (every 10 minutes), via satellite, to notify emergency services and the public about potential bushfires (Geoscience Australia 2015)

- the NSW Government issued a heatwave plan in 2011 (updated in 2018) to help in preparing for, responding to and recovering from heatwaves, with human health being the primary focus (NSW Government 2018).

At a national and global level, Australia is committed to dealing with climate change and its impacts, including the downstream adverse effects on human health (United Nations n.d.). In 2016, Australia reaffirmed its commitment to the Kyoto Protocol and endorsed the Paris Agreement, including a pledge to reduce emissions by 26–28% below 2005 levels by 2030; to further increase Australia’s renewable energy capacity; and to manage climate risks by building resilience in the community, economy and environment (Department of Environment and Energy n.d.c.).

## What is missing from the picture?

Understanding the impact of the natural environment on human health is complex. In recent years, research has focused on a better grasp of the causal links between human health and the environment. However, many data gaps still exist that need to be filled to ensure this continues, such as:

- consideration of real-time or more frequent data collections that gather and link data on human health and the natural environment, including determining causality, and monitoring trends and projections
- provision of data by small geographic areas to measure human exposure to factors of the natural environment at a local level.

Another area of interest is research that focuses on the effect of climate change on the health of populations at risk, including older Australians, people in low socioeconomic areas, socially or geographically isolated individuals and communities, and Aboriginal and Torres Strait Islander people (AAOS 2015).

## Where do I go for more information?

The 2011 AIHW report *Health and the environment: a compilation of evidence* collates evidence on the relationship between health and a selected list of environmental factors (AIHW 2011). It also discusses the difficulties involved in assessing the broader relationship between health and the environment.

Every 5 years, the Department of the Environment and Energy produces a report on the Australian state of the environment (Australian State of the Environment Committee 2016). The 2016 edition is available from [soe.environment.gov.au/download/reports](http://soe.environment.gov.au/download/reports).

## References

- AAOS (Australian Academy of Science) 2015. Climate change challenges to health: risks and opportunities. Recommendations from the 2014 Theo Murphy High Flyers Think Tank. Canberra: AAOS.
- ABS (Australian Bureau of Statistics) 2013. Population Projections, Australia 2012 (base) to 2101. ABS cat. no. 3222.0. Canberra: ABS.
- ABS 2014a. Australian Health Survey: biomedical results for nutrients, 2011–12: feature article: Vitamin D. ABS cat. no. 4364.0.55.006. Canberra: ABS.
- ABS 2014b. Measures of Australia’s progress, 2013. ABS cat. no. 1370. Canberra: ABS.
- ABS 2017. Australian demographic statistics—September quarter 2017. ABS cat. no. 3101. Canberra: ABS.

- AIHW (Australian Institute of Health and Welfare) 2011. Health and the environment: a compilation of evidence. Cat. no. PHE 136. Canberra: AIHW.
- AIHW 2012. Australia's health. Australia's health series no.13. Cat. no. AUS 156. Canberra: AIHW.
- AIHW 2016a. Australian Burden of Disease Study: impact and causes of illness and death in Australia 2011. Australian Burden of Disease Study series no. 3. BOD 4. Canberra: AIHW.
- AIHW 2016b. Skin cancer in Australia. Cat. no. CAN 96. Canberra: AIHW.
- AIHW 2017. Cancer in Australia 2017. Cancer series no.101. Cat. no. CAN 100. Canberra: AIHW.
- Asthma Australia 2017. Thunderstorm asthma. Chatswood: Asthma Australia. Viewed 1 November 2017, <<https://www.asthmaaustralia.org.au/sa/about-asthma/resources/onair/2017/feb/thunderstorm-asthma>>.
- Barnett AG, Williams GM, Schwartz J, Neller AH, Best TL, Petroeschevsky AL & Simpson RW 2005. Air pollution and child respiratory health—a case-crossover study in Australia and New Zealand. *American Journal of Respiratory and Critical Care Medicine* 171:1272–8.
- Bureau of Meteorology 2017. National performance report 2015–16: urban water utilities, part A. Melbourne: Bureau of Meteorology.
- Bureau of Meteorology 2018. About the heatwave service. Melbourne: Bureau of Meteorology. Viewed 21 February 2018, <<http://www.bom.gov.au/australia/heatwave/about.shtml>>.
- Bowatte G, Lodge CJ, Knibbs LD, Lowe AJ, Erbas B, Dennekamp M et al. 2017. Traffic-related air pollution exposure is associated with allergic sensitization, asthma, and poor lung function in middle age. *Journal of Allergy and Clinical Immunology* 139(1):122–9.
- Broome RA, Fann N, Cristina TJN, Fulcher C, Duc H & Morgan GG 2015. The health benefits of reducing air pollution in Sydney, Australia. *Environmental Research* 143:19–25.
- Broome RA, Johnston FH, Horsley J & Morgan GG 2016. A rapid assessment of the impact of hazard reduction burning around Sydney, May 2016. *Medical Journal of Australia* 205(9):407–8.
- Byleveld PM, Leask SD, Jarvis LA, Wall KJ, Henderson WN & Tickell JE 2016. Safe drinking water quality in Australia. *Public Health and Research Practice* 26(2).
- Cancer Council Australia 2018. Skin cancer. Sydney: Cancer Council Australia. Viewed 24 October 2017, <<http://www.cancer.org.au/about-cancer/types-of-cancer/skin-cancer.html>>.
- Centres for Disease Control and Prevention 2017. Drought and your health. Atlanta: National Center for Environmental Health. Viewed 21 February 2018, <<https://www.cdc.gov/features/drought/index.html>>.
- Department of the Environment and Energy n.d.a. Air quality. Canberra: Department of the Environment and Energy. Viewed 24 October 2017, <<http://www.environment.gov.au/protection/air-quality>>.
- Department of the Environment and Energy n.d.b. Climate change impacts in Australia. Canberra: Department of the Environment and Energy. Viewed 21 February 2018, <<http://www.environment.gov.au/climate-change/climate-science-data/climate-science/impacts>>.
- Department of the Environment and Energy n.d.c. Government and international initiatives. Canberra: Department of the Environment and Energy. Viewed 24 October 2017, <<http://www.environment.gov.au/climate-change/government>>.
- Department of the Environment and Energy n.d.d. Understanding climate change. Canberra: Department of the Environment and Energy. Viewed 6 November 2017, <<http://www.environment.gov.au/climate-change/climate-science-data/climate-science/understanding-climate-change>>.
- Department of Health 2018. National Notifiable Diseases Surveillance System. Notifications of All diseases by State and Territory and Year. Canberra: Department of Health. Viewed 28 November 2017, <[http://www9.health.gov.au/cda/source/rpt\\_1.cfm](http://www9.health.gov.au/cda/source/rpt_1.cfm)>.
- Dutta R, Das A & Aryal J 2016. Big data integration shows Australian bush-fire frequency is increasing significantly. *Royal Society Open Science* 3(2):150241.
- Edwards B, Gray M & Hunter B 2008. Social and economic impacts of drought on farm families and rural communities. Submission to the Productivity Commission's Inquiry into Government Drought Support. Melbourne: Australian Institute of Family Studies.
- enHealth (Environmental Health Standing Committee) 2016. Preventing disease and injury through healthy environments: Environmental Health Standing Committee (enHealth) Strategic Plan 2016 to 2020. Canberra: Department of Health.



- EPA Victoria (Environmental Protection Authority Victoria) 2017. Human health. Melbourne: EPA Victoria. Viewed 1 November 2017, <<http://www.epa.vic.gov.au/your-environment/human-health>>.
- FSANZ (Food Standards Australia New Zealand) 2017. Annual report 2016–17. Canberra: FSANZ. Viewed 26 February 2018, <<http://www.foodstandards.gov.au/publications/annualreport201617/Documents/FSANZ%20Annual%20Report%202016-17%20Preliminary%20information.pdf>>.
- Garnaut R 2008. The Garnaut climate change review. Port Melbourne: Cambridge University Press.
- Geoscience Australia n.d. Bushfire. Canberra: Geoscience Australia. Viewed 28 November 2017, <<http://www.ga.gov.au/scientific-topics/hazards/bushfire>>.
- Geoscience Australia 2015. Upgraded bushfire monitoring capability to keep communities safer. Canberra: Geoscience Australia. Viewed 8 November 2017, <<http://www.ga.gov.au/news-events/news/latest-news/upgraded-bushfire-monitoring-capability-to-keep-communities-safer>>.
- Haikerwal A, Akram M, Del Monaco A, Smith K, Sim MR, Meyer M et al. 2015. Impact of fine particulate matter (PM<sub>2.5</sub>) exposure during wildfires on cardiovascular health outcomes. *Journal of the American Heart Association* 4(7).
- Hanigan IC, Butler CD, Kocic PN & Hutchinson MF 2012. Suicide and drought in New South Wales, Australia, 1970–2007. *Proceedings of the National Academy of Sciences of the United States of America* 109(35):13950–5.
- Jackson WJ, Argent RM, Bax NJ, Clark GF, Coleman S, Cresswell ID et al. 2017. Australia—state of the environment 2016: overview. Canberra: Department of the Environment and Energy.
- Johnston F 2009. Bushfires and human health in a changing environment. *Australian Family Physician* 38:720–4.
- Johnston F, Purdie S, Jalaludin B, Martin K, Henderson S & Morgan G 2014. Air pollution events from forest fires and emergency department attendances in Sydney, Australia 1996–2007: a case-crossover analysis. *Environmental Health* 13(105).
- Johnston F 2017. Understanding and managing the health impacts of poor air quality from landscape fires. *Medical Journal of Australia* 207(6):229–30.
- Joshi D, Center JR & Eisman JA 2010. Vitamin D deficiency in adults. *Australian Prescriber* 33(4).
- Kalis MA, Miller MD & Wilson RJ 2009. Public health and drought. *Journal of Environmental Health* 72:10–1.
- Keyword MD, Emmerson KM, Hibberd MF 2016. Ambient air quality: health impacts of air pollution. In: Australia—state of the environment 2016. Canberra: Department of the Environment and Energy.
- Kirk M, Ford L, Glass K & Hall G 2014. Foodborne illness, Australia, circa 2000 and circa 2010. *Emerging Infectious Diseases* 20(11):1857–64.
- Lucas R, McMichael T, Smith W & Armstrong B 2006. Solar ultraviolet radiation. Global burden of disease from solar ultraviolet radiation. World Health Organisation Environmental Burden of Disease series, No. 13. Geneva: World Health Organisation.
- McDermott BM & Palmer LJ 1999. Post-disaster service provision following proactive identification of children with emotional distress and depression. *Australian and New Zealand Journal of Psychiatry* 33:855–63.
- McMichael AJ, Woodruff RE & Hales S 2006. Climate change and human health: present and future risks. *The Lancet* 367(9513):859–69.
- Morrissey S & Reser J 2007. Natural disasters, climate change and mental health considerations for rural Australia. *Australian Journal of Rural Health* 15:120–5.
- NHMRC (National Health and Medical Research Council) 2017a. Information paper—Water fluoridation: dental and other human health outcomes. Report prepared by the Clinical Trials Centre at University of Sydney. Canberra: NHMRC.
- NHMRC 2017b. NHMRC Public Statement—water fluoridation and human health in Australia. Canberra: NHMRC. Viewed 6 December 2017, <[https://www.nhmrc.gov.au/\\_files\\_nhmrc/file/publications/17667\\_nhmrc\\_-\\_public\\_statement-web.pdf](https://www.nhmrc.gov.au/_files_nhmrc/file/publications/17667_nhmrc_-_public_statement-web.pdf)>.
- NHMRC & NRMCC (National Resource Management Ministerial Council) 2011. Australian Drinking Water Guidelines: paper 6. National Water Quality Management Strategy. Canberra: NHMRC & NRMCC.

- NSW Government 2011. State Heatwave Sub Plan: a sub plan of the NSW State Disaster Plan. Sydney: NSW Government. Viewed 26 March 2018, <[https://www.emergency.nsw.gov.au/Documents/plans/sub-plans/SubPlan\\_HeatWave.pdf](https://www.emergency.nsw.gov.au/Documents/plans/sub-plans/SubPlan_HeatWave.pdf)>.
- OECD (Organisation for Economic Co-operation and Development) Data 2016. Air and GHG emissions. Paris: OECD. Viewed 6 November 2017, <<https://data.oecd.org/air/air-and-ghg-emissions.htm>>.
- OECD 2017. Exposure to PM2.5 in countries and regions in OECD.Stat. Paris: OECD. Viewed 23 February 2018, <<http://stats.oecd.org/>>.
- Olsen CM, Wilson LF, Green AC, Bain CJ, Fritschi L, Neale RE et al. 2015. Cancers in Australia attributable to exposure to solar ultraviolet radiation and prevented by regular sunscreen use. *Australian and New Zealand Journal of Public Health* 39(5):471–6.
- Osteoporosis Australia 2017. Vitamin D. Sydney: Osteoporosis Australia. Viewed 1 November 2017, <<https://www.osteoporosis.org.au/vitamin-d/>>.
- Parliament of Victoria 2010. 2009 Victorian Bushfires Royal Commission: final report summary. Melbourne: Parliament of Victoria. Viewed 28 November 2017, <[http://royalcommission.vic.gov.au/finaldocuments/summary/PF/VBRC\\_Summary\\_PF.pdf](http://royalcommission.vic.gov.au/finaldocuments/summary/PF/VBRC_Summary_PF.pdf)>.
- Pope CA & Dockery DW 2006. Health effects of fine particulate air pollution: lines that connect. *Journal of the Air and Waste Management Association* 56:709–42.
- Russell RC 1998. Mosquito-borne arboviruses in Australia: the current scene and implications of climate change for human health. *International Journal for Parasitology* 28(6):955–69.
- Tong S, Ren C & Becker N 2010. Excess deaths during the 2004 heatwave in Brisbane, Australia. *International Journal of Biometeorology* 54:393–400.
- Trewin BJ, Brian H, Kay BH, Darbro JM & Hurst TP 2013. Increased container-breeding mosquito risk owing to drought-induced changes in water harvesting and storage in Brisbane, Australia. *International Health* 5(4):251–8.
- United Nations n.d. Sustainable development goals—goal 13: take urgent action to combat climate change and its impacts. New York: United Nations. Viewed 15 January 2018, <<http://www.un.org/sustainabledevelopment/climate-change-2/>>.
- Victorian Department of Health and Human Services 2009. January 2009 heatwave in Victoria: an assessment of health impacts. Melbourne: Victorian Department of Health.
- Victorian Department of Health and Human Services 2017a. Epidemic thunderstorm asthma forecasting. Melbourne: Victorian Government Department of Health. Viewed 28 November 2017, <<https://www2.health.vic.gov.au/public-health/environmental-health/climate-weather-and-public-health/thunderstorm-asthma/forecasting>>.
- Victorian Department of Health and Human Services 2017b. The November 2016 Victorian epidemic thunderstorm asthma event: an assessment of the health impacts—The Chief Health Officer's Report, 27 April 2017. Melbourne: Victorian Department of Health.
- WHO (World Health Organization) 2013. Review of evidence on health aspects of air pollution—REVIHAAP project: technical report. Bonn: WHO European Centre for Environment and Health.
- WHO 2014. Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s. Geneva: WHO. Viewed 28 March 2018, <<http://www.who.int/globalchange/publications/quantitative-risk-assessment/en/>>.
- WHO 2017a. Climate change and health. Geneva: WHO. Viewed 20 November 2011, <<http://www.who.int/mediacentre/factsheets/fs266/en/>>.
- WHO 2017b. Environmental health. Geneva: WHO. Viewed 7 November 2017, <[http://www.searo.who.int/topics/environmental\\_health/en/](http://www.searo.who.int/topics/environmental_health/en/)>.
- Yzermans CJ, Donker GA, Kerssens JJ, Dirkwager AJE, Soeteman RJH & ten Veen PMH 2005. Health problems of victims before and after disaster: a longitudinal study in general practice. *International Journal of Epidemiology* 34:820–6.

## 4.2 Social determinants of health

Evidence supports the close relationship between people's health and the living and working conditions which form their social environment. Factors such as socioeconomic position, conditions of employment, power and social support—known collectively as the social determinants of health—act together to strengthen or undermine the health of individuals and communities. The World Health Organization (WHO) describes social determinants as:

...the circumstances in which people grow, live, work, and age, and the systems put in place to deal with illness. The conditions in which people live and die are, in turn, shaped by political, social, and economic forces (CSDH 2008).

According to the WHO, social inequalities and disadvantage are the main reason for unfair and avoidable differences in health outcomes and life expectancy across groups in society. In 2015, the all-cause mortality rate for people in the lowest socioeconomic group was 1.5 times as high as for people in the highest socioeconomic group (see Chapter 5.1 'Socioeconomic groups'). This is reflected in life expectancy gaps. In 2011, Australian males and females in the lowest socioeconomic group lived, on average, 5.7 and 3.3 years less than males and females in the highest socioeconomic group.

This snapshot provides a brief overview of some of the key social determinants of health in Australia.

### Socioeconomic position

Socioeconomic position can be described by indicators such as educational attainment, income or occupation. In general, every step up the socioeconomic ladder is accompanied by a benefit for health. The relationship is two-way—poor health can be both a product of, and contribute to, lower socioeconomic position (see Chapter 5.1 'Socioeconomic groups').

- In 2017, 66% of people aged 20–64 held a non-school qualification, an increase of 8.5 percentage points since 2007 (ABS 2017a).
- Around 13% of the Australian population were estimated to be in relative income poverty in 2013–14, a figure that has changed little over the last 10 years (ACOSS 2016).
- Among major occupation groups, Managers had the highest average weekly total cash earnings in 2016 (\$2,298), and Sales workers, the lowest (\$652) (ABS 2017b).

### Early life

The foundations of adult health are laid in-utero and during the perinatal and early childhood periods. The different domains of early childhood development—physical, social/emotional and language/cognition—strongly influence school success, economic participation, social citizenship and health.

- One in 10 (10%) mothers who gave birth in 2015 smoked at some time during their pregnancy, a drop from 15% in 2009. In 2015, smoking rates varied from 3.4% in the highest socioeconomic group to 18% in the lowest socioeconomic group.



- More than 1 in 5 (22%) children entering primary school in 2015 were assessed as being developmentally vulnerable on one or more domains, including physical health and wellbeing, social competence, emotional maturity, language and cognition skills, or communication skills and general knowledge.
- One in 10 (10%) children aged 4–12 were classified as having abnormal social and emotional wellbeing in 2013–14, affecting their individual and relational characteristics in their home, school and community environments.

## Social exclusion

Social exclusion is a term that describes social disadvantage and lack of resources, opportunity, participation and skills (McLachlan et al. 2013) (see Glossary). Social exclusion through discrimination or stigmatisation can cause psychological damage and harm health through long-term stress and anxiety. Poor health can also lead to social exclusion.

- More than one-fifth (22%, or 4.3 million people) of Australians aged 15 and over experienced some degree of social exclusion in 2015, with 5.3% (1.0 million) experiencing deep social exclusion and 1.1% (210,000) very deep social exclusion (Brotherhood of St Laurence & Melbourne Institute 2017).
- People in certain groups are more likely to experience social exclusion, including women, people aged over 65, immigrants from non-English speaking countries, Aboriginal and Torres Strait Islander people, people with disability or a long-term health condition, early school leavers, single-person and lone-parent households, and public housing tenants (Brotherhood of St Laurence & Melbourne Institute 2017).

## Employment and work

The psychosocial stress caused by unemployment has a strong impact on physical and mental health and wellbeing. Once employed, participating in quality work helps to protect health, instilling self-esteem and a positive sense of identity, while providing the opportunity for social interaction and personal development.

- The proportion of the Australian population aged 15 and over who are employed (employment-to-population ratio) has fluctuated over the last 20 years, from 58% in December 1997 to 62% in December 2017. Over the same period, the unemployment rate fell from 7.9% to 5.4% (ABS 2017c).
- In June 2017, there were 1.4 million jobless families in Australia (21% of all families)—a similar figure to that in June 2012 (20%)—and around 339,000 jobless families (11%) had dependants (ABS 2017d).

## Housing and homelessness

Access to appropriate, affordable and secure housing can limit the risk of Australians being socially excluded by factors such as homelessness, overcrowding and poor physical and mental health.

Poor-quality housing influences physical and mental health. Young people, Indigenous Australians, people with long-term health conditions or disability, people living in

low-income housing, or people who are unemployed or underemployed are at greatest risk of living in poor-quality housing (Baker et al. 2016).

- On Census night in 2016, more than 116,000 men, women and children in Australia were estimated to be homeless, or 50 per 10,000 population—an increase of 4.6% from 48 per 10,000 population in 2011 (ABS 2018).
- As at 30 June 2016, around 195,000 households were on social housing waiting lists, with 47% having waited for more than 2 years.
- In 2016, overcrowding in households, based on those households needing one or more extra bedroom, was 3.8%, up from 3.4% in 2011. Overcrowding was much higher for Indigenous households at 10% (but down from 12% in 2011).

## Built environment

The built environment is the setting for human activity. It affects health equity through its influence on local resources, behaviour and safety. The built environment also affects other social determinants, including housing conditions, access to work and educational opportunities.

Urban environments that promote health encourage and support physical activity; they also strengthen social interaction and enable access to healthy food.

- Almost all (98%) Canberra residents lived within 400 metres of public green space in 2011, compared with 79% of Melbourne residents (Coleman 2017).
- Nearly one-quarter (22% or 2.0 million people) of commuters had lengthy travel times of 45 minutes or more one way in 2012, with resultant financial costs through journey delay, as well as stress, fatigue and other health impacts (Coleman 2017).

## Better health through action on social determinants

Action on the social determinants of health is an appropriate way to tackle unfair and avoidable health inequalities.

One study estimates that if action were taken on social determinants—and the health gaps between the most and least disadvantaged closed—0.5 million Australians could be spared chronic illness, \$2.3 billion in annual hospital costs could be saved, and Pharmaceutical Benefit Scheme prescription numbers cut by 5.3 million (Brown et al. 2012). In Australia, a focus has been on social and cultural determinants aiming to close the gap in Indigenous health (see Chapter 6.6 ‘Social determinants and Indigenous health’).

The WHO Commission on Social Determinants of Health has suggested that countries adopt a ‘whole-of-government’ approach to deal with the social determinants of health, with policies and interventions from all sectors and levels of society (WHO 2011). The evidence shows that actions within four main areas (early child development, fair employment and decent work, social protection, and the living environment) are likely to have the greatest impact on the social determinants of health (Saunders et al. 2017).

## What is missing from the picture?

Data and analysis gaps limit the monitoring of social determinants. Many health data collections do not include socioeconomic information. There is scope to link health and welfare data—as in the South Australian Early Childhood Data Project (Nuske et al. 2016)—to provide a broader understanding of the experience of population cohorts, the relationships between health and welfare, and greater evidence for causal pathways to good health.

## Where do I go for more information?

A detailed discussion of social determinants of health appeared in *Australia's health 2016*.

For more information on disadvantage and social inequalities, see the AIHW report *Australia's welfare 2017*.

The WHO plays a leading role in supporting countries to take action on the social determinants of health: <[www.who.int/social\\_determinants/sdh\\_definition/en](http://www.who.int/social_determinants/sdh_definition/en)>.

## References

- ABS (Australian Bureau of Statistics) 2017a. Education and work, Australia, May 2017. ABS cat. no. 6227.0. Canberra: ABS.
- ABS 2017b. Employee earnings and hours, Australia, May 2016. ABS cat. no. 6306.0. Canberra: ABS.
- ABS 2017c. Labour force survey, April 2017. ABS cat. no. 6202.0. Canberra: ABS.
- ABS 2017d. Labour force, Australia: labour force status and other characteristics of families, June 2017. ABS cat. no. 6224.0.55.001. Canberra: ABS.
- ABS 2018. Census of population and housing: estimating homelessness, 2016. ABS cat. no. 2049.0. Canberra: ABS.
- ACOSS (Australian Council of Social Service) 2016. Poverty in Australia 2016. Sydney: ACOSS.
- Baker E, Lester LH, Bentley R & Beer A 2016. Poor housing quality: prevalence and health effects. *Journal of Prevention & Intervention in the Community* 44:219–32.
- Brotherhood of St Laurence & Melbourne Institute 2017. Social exclusion monitor. Melbourne: Brotherhood of St Laurence. Viewed 19 January 2017, <<https://www.bsl.org.au/research/social-exclusion-monitor/>>.
- Brown L, Thurecht L & Nepal B 2012. The cost of inaction on the social determinants of health. Report no. 2/2012: CHA-NATSEM second report on health inequalities. Canberra: National Centre for Social and Economic Modelling.
- Coleman S 2017. Australia: state of the environment 2016: built environment. Canberra: Department of the Environment and Energy.
- CSDH (Commission on Social Determinants of Health) 2008. Closing the gap in a generation: health equity through action on the social determinants of health. Final report of the Commission on Social Determinants of Health. Geneva: World Health Organization.
- McLachlan R, Gilfillan G & Gordon J 2013. Deep and persistent disadvantage in Australia. Canberra: Productivity Commission.
- Nuske T, Pilkington R, Gialamas A, Chittleborough C, Smithers L & Lynch J 2016. The early childhood data project. Research series 2016. Adelaide: School of Public Health, The University of Adelaide.
- Saunders M, Barr B, McHale P & Hamelmann C 2017. Key policies for addressing the social determinants of health and health inequities. Copenhagen: World Health Organization Regional Office for Europe.
- WHO (World Health Organization) 2011. Closing the gap: policy into practice on social determinants of health: discussion paper. Geneva: WHO.

## 4.3 Health literacy

Australians are encouraged to actively participate in maintaining their health. Health literacy can influence how much and how effectively people do this. It has two major components (ACSQHC 2014a):

- **Individual health literacy** is about a person's ability to access, understand and apply health information; for example, to complete health care forms or navigate the health care system.
- The **health literacy environment** describes the infrastructure, people, policies and relationships of the health care system. Aspects of the health literacy environment include patient referral pathways, coordination of care, and hospital design.

### Why is health literacy important?

Health literacy plays a part in the safety and quality of health care. It can influence decisions people make, such as how often to take medication, when to access health care services, and which services to access. Low individual health literacy can be associated with higher rates of hospitalisation and emergency care use, sometimes indicating poor management of health conditions outside the hospital system (Bush et al. 2010).

Low levels of health literacy are also associated with undesirable outcomes, such as premature death among older people, lower participation in preventative programs (including influenza vaccination and cervical and breast cancer screening) (Berkman et al. 2011), and poor medication adherence (Diug et al. 2011). As health systems are becoming increasingly complex, health literacy is becoming more important.

### How health literate are Australians?

In 2006, the Australian Bureau of Statistics (ABS) conducted a Health Literacy Survey. Respondents were asked to complete a range of tasks designed to test their understanding of health promotion, health protection, disease prevention and management, and navigation of the health system. Responses indicated that only 41% of adult Australians had a level of health literacy that would allow them to meet the complex demands of everyday life (ABS 2009).

A person's health literacy can be influenced by their cultural beliefs, language, disability, education, income and health status (Sørensen et al. 2012). For example, the ABS survey showed that health literacy was lower in people who speak English as a second language (26%) and higher in people who have completed a Bachelor degree or higher (70%). Health literacy was also higher among people with high incomes (63%) than among people on low incomes (21%) (ABS 2009).

See Chapter 1.4 'Indicators of Australia's health' for more information on health literacy as an indicator.

Limited information is available on the health literacy environment. The ABS Survey of Health Care 2016 (ABS 2017) did not directly measure health literacy but contained some relevant questions. Analysis revealed that 95% of respondents reported that their specialist doctor explained treatment choices in a way that they could understand, and 88% reported that their general practitioner usually or always involved them in decisions about their own health care. Shared decision making by the provider and patient is needed for effective communication.

See Chapter 7.18 'Coordination of health care' for more information on the ABS Survey of Health Care.

## How can health literacy be improved?

In 2014, all Australian health ministers endorsed the 'National statement on health literacy' (ACSQHC 2014b) developed by the Australian Commission on Safety and Quality in Health Care (the Commission). The statement proposed a coordinated approach to improve the health literacy of Australians across three areas:

1. Incorporate health literacy into health care systems; for example, through legislation, policies, plans, standards, funding mechanisms and educational curriculums.
2. Improve communication of health information between providers and users, including interpersonal communication, written information and health promotion campaigns.
3. Include health literacy in the education of adults, children and health care providers.

Several national initiatives relating to one or more of these areas are underway (Box 4.3.1).

### Box 4.3.1 Initiatives to improve health literacy

The Commission and Healthdirect Australia have developed 'Question builder', an online tool for patients to prepare for a medical appointment. It allows patients to select questions they want to ask at the appointment and prepare for questions the doctor may ask them. This allows the patient to be more involved in their own health care and improves their ability to make informed decisions (ACSQHC 2017a).

The Commission also released 'Top tips for safe health care', a booklet that provides information about what people should consider when interacting with the health system, such as finding good information, asking about care after leaving hospital and giving feedback (ACSQHC 2017b).

'Choosing Wisely Australia' is an initiative of NPS MedicineWise; it is based on 'Choosing Wisely', developed by the ABIM Foundation in the United States.

'Choosing Wisely Australia' includes strategies to encourage and empower people to communicate effectively with their doctor. It provides evidential information on different options to help patients avoid unnecessary tests, treatments and procedures, and better understand their options (NPS MedicineWise 2016).



## What is missing from the picture?

Health literacy is a broad and complex concept that is difficult to measure. As outlined in this snapshot, there are limited Australian data available on health literacy (related to the individual or environment). The last national survey measuring health literacy was conducted more than a decade ago, in 2006 (ABS 2009). The ABS will conduct another similar survey in 2018, following up respondents from the 2017–18 National Health Survey.

While there is evidence to inform the improvement of some aspects of health literacy, work has yet to be finished in creating a common measurement scale to evaluate the effectiveness of new strategies. Further work to develop suitable performance measures and identify the most appropriate data to collect would be useful.

## Where do I go for more information?

More information on health literacy and safety and quality in health care is available on the Commission's website <[www.safetyandquality.gov.au](http://www.safetyandquality.gov.au)>.

Information on the Choosing Wisely initiative is available on the [Choosing Wisely](#) website.

Information on the Question Builder initiative is available on the [Health Direct](#) website.

## References

- ABS (Australian Bureau of Statistics) 2009. Health literacy. ABS cat. no. 4233.0. Canberra: ABS.
- ABS 2017. Survey of health care. ABS cat. no. 4343.0. Canberra: ABS.
- ACSQHC (Australian Commission on Safety and Quality in Health Care) 2014a. Health literacy: taking action to improve safety and quality. Sydney: ACSQHC.
- ACSQHC 2014b. National statement on health literacy. Sydney: ACSQHC.
- ACSQHC 2017a. Question builder. Sydney: ACSQHC. Viewed 10 November 2017, <<https://www.safetyandquality.gov.au/questionbuilder>>.
- ACSQHC 2017b. Top tips for safe health care. Sydney: ACSQHC. Viewed 18 December 2017, <<https://www.safetyandquality.gov.au/publications/top-tips-for-safer-health-care/>>.
- Berkman ND, Sheridan SL, Donahue KE, Halpern DJ, Viera A, Crotty K, Holland A, Brasure M, Lohr KN, Harden E, Tant E, Wallace I & Viswanathan M 2011. Health literacy interventions and outcomes: an updated systematic review. Evidence Report/Technology assessments 199:1–941.
- Bush R, Boyle F, Ostini R, Ozolins I, Brabant M, Soto EJ et al. 2010. Advancing health literacy through primary health care systems. Canberra: Australian National University.
- Diug B, Evans S, Lowthian J, Maxwell E, Dooley M, Street A et al. 2011. The unrecognized psychosocial factors contributing to bleeding risk in warfarin therapy. Stroke 42:2866–71.
- NPS MedicineWise 2016. What is Choosing Wisely Australia? Sydney: NPS MedicineWise. Viewed 10 November 2017, <<http://www.choosingwisely.org.au/about-choosing-wisely-australia/what-is-choosing-wisely-australia>>.
- Sørensen K, Van den Broucke S, Fullam J, Doyle G, Pelikan J, Slonska Z et al. 2012. Health literacy and public health: a systematic review and integration of definitions and models. BMC Public Health 12.

## 4.4 Contribution of selected risk factors to burden of disease

Risk factors such as tobacco use, risky alcohol consumption, illicit drug use, not getting enough exercise, and poor eating patterns can have a detrimental effect on health. Almost one-third of the overall disease burden could be prevented by reducing exposure to these and other modifiable risk factors (AIHW 2016a). Even small changes to our daily exercise routines or body weight could substantially reduce disease burden. For example, an extra 15 minutes of brisk walking, 5 days each week, could reduce the disease burden in the population due to physical inactivity by about 14% (AIHW 2017c). The loss of 3 kilograms by a person of average height could reduce disease burden in the population due to overweight and obesity by 14% (AIHW 2017b).

Burden of disease analysis (Box 4.4.1) measures the combined impact of morbidity (non-fatal burden) and mortality (fatal burden) in a consistent manner so as to assess and compare the health loss from different diseases and injuries in a population. The analysis also estimates the contribution of various risk factors to disease burden.

Burden of disease estimates are designed to inform health policy for the prevention, early intervention and treatment of diseases and risk factors, as well as to inform health promotion and management strategies and resource allocation.

### Box 4.4.1: What is burden of disease?

Burden of disease analysis quantifies the gap between a population's actual health and an ideal level of health in a given year—that is, every individual living in full health to the theoretical maximum life span—for all diseases at the same time. It does this by measuring the health consequences of living with ill health and injury (non-fatal burden) and of dying prematurely from illness and injury (fatal burden). It also quantifies the contribution of various risk factors to this burden.

Burden of disease is measured using the summary measure disability-adjusted life years (DALYs). One DALY is 1 year of 'healthy life' lost due to illness and/or death—the more DALYs associated with a disease or injury, the greater the burden. The total disease burden is the sum of all DALYs (burden) estimated for all diseases and injuries in the year of study for the whole population.

The attributable burden reflects the direct relationship between a risk factor (for example, overweight and obesity) and a disease outcome. It is the amount of burden that could be avoided if the risk factor were removed or reduced to the lowest possible exposure. When the risk factor is a disease, such as diabetes, the additional burden from diseases linked to the disease risk factor represents the indirect burden. More information about indirect burden can be found in section 'Diabetes and chronic kidney disease as risk factors for other diseases'.

*(continued)*

#### **Box 4.4.1 (continued): What is burden of disease?**

Linked diseases are those that have a causal association with the risk factor of interest. A disease was included in the analysis if it was considered to have a 'convincing' or 'probable' level of evidence supporting a causal association, according to criteria set by the World Cancer Research Fund—a highly regarded set of criteria for evaluating evidence. Burden of disease studies use data on how prevalent the risk factor is in the population, and relative risks, to measure the size of the association between risk factors and linked diseases. Relative risks are a measure of how much more likely an outcome is in people exposed to the risk factor than in people who are not (AIHW 2016b).

Details on the methods used to calculate burden of disease in the Australian Burden of Disease Study are in the AIHW report [Australian Burden of Disease Study 2011: methods and supplementary material](#).

The Australian Burden of Disease Study (ABDS) 2011, undertaken by the AIHW, provides information on the burden of disease and injury for the Australian population for around 200 diseases and injuries (grouped into 17 disease groups) and 29 risk factors (see Chapter 3.1 'Burden of disease across the life stages').

This article presents information on estimates of disease burden attributable to selected risk factors for 2011. This work draws on the latest evidence on the causal association between different diseases and injuries (referred to as 'linked diseases' in this article) and the risk factor. The following risk factors are included: overweight and obesity, physical inactivity, alcohol and illicit drug use, intimate partner violence, and diseases considered as risk factors for other diseases—chronic kidney disease (CKD) and diabetes. Table 4.4.1 summarises the proportion of disease burden attributed to these risk factors, by selected disease groups, and in total.

See Chapter 3.14 'Dementia' for information on the contribution of vascular risk factors and diseases to the burden of dementia in Australia.

This article does not cover other leading risk factors included in the ABDS 2011, such as tobacco use (representing 9.0% of the burden in 2011) and high blood pressure (4.9%). See chapters 4.5 'Tobacco smoking', 4.11 'Biomedical risk factors' for more information on these risk factors.

Table 4.4.1: Proportion of disease burden attributed to selected risk factors, 2011

	Risk factor				
	Overweight and obesity	Alcohol use	Insufficient physical activity	Illicit drug use	Intimate partner violence <sup>(a)</sup>
<b>All diseases and injuries</b>	<b>7.0</b>	<b>4.6</b>	<b>2.6</b>	<b>2.3</b>	<b>1.4</b>
<b>Disease group</b>					
Cancer	7.2	4.4	2.9	0.7	..
Cardiovascular	18.0	1.8	8.0	..	..
Mental <sup>(b)</sup>	..	12.2	..	6.1	7.2
Injuries	..	17.9	..	12.7	7.1
Endocrine	50.6	..	18.0	..	..

(a) Estimates are for women who were subject to violence from cohabiting partners only.

(b) Includes mental and substance use disorders.

Note: Blank cells ( . ) indicate that the risk factor has no associated diseases or injuries in the disease group.

Sources: AIHW 2017b, 2017c, 2018b; Ayre et al. 2016.

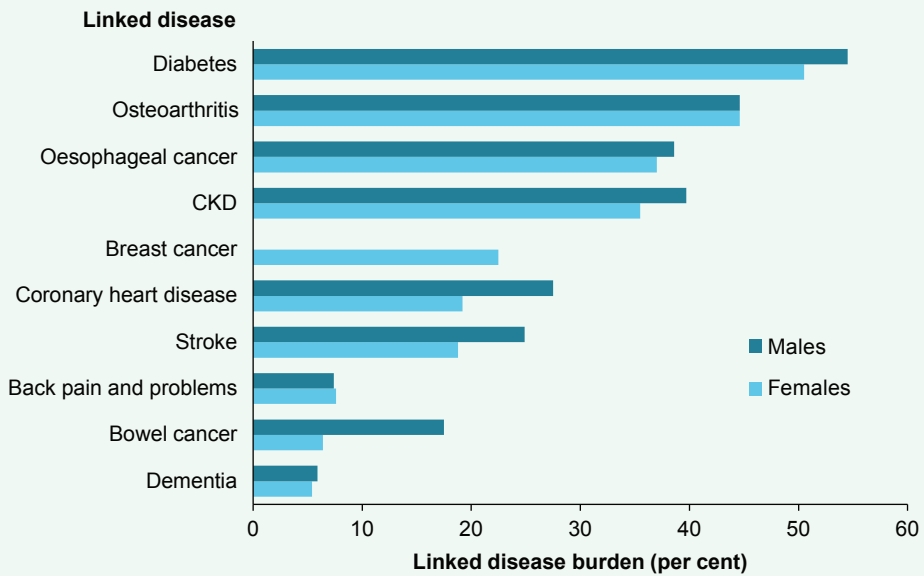
## Overweight and obesity

Overweight and obesity is a major public health issue, with nearly 2 in 3 (63%) adults and more than 1 in 4 (28%) children in Australia considered overweight or obese (ABS 2015). Overweight and obese adults have an increased risk of cardiovascular disease, CKD, some types of cancer, diabetes and musculoskeletal problems (AIHW 2017c).

Seven per cent (7.0%) of the total health burden in Australia in 2011 was due to overweight and obesity. The attributable burden due to overweight and obesity was higher in males (7.3% of all burden) than in females (6.6%). Around 63% of the burden was due to fatal outcomes.

Overweight and obesity was linked to 22 diseases; 11 types of cancer, 3 cardiovascular conditions, CKD, diabetes, dementia, gallbladder disease, gout, back pain and problems, osteoarthritis, and asthma. Figure 4.4.1 presents the top 10 linked diseases. Overweight and obesity was responsible for 53% of diabetes burden, 45% of osteoarthritis burden and 38% of CKD burden in 2011. An estimated 22% of breast cancer burden in females was due to overweight and obesity.

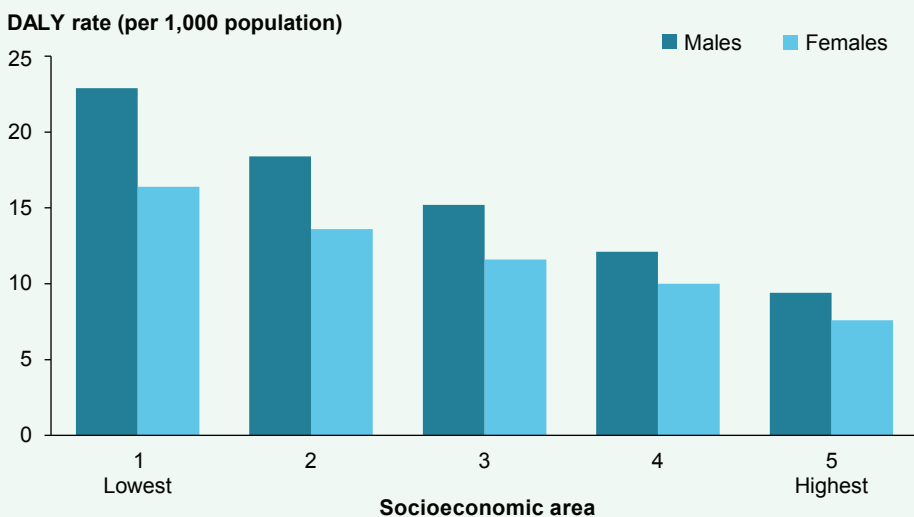
**Figure 4.4.1: Proportion of linked disease burden (DALYs) due to overweight and obesity, by sex and top 10 linked diseases, 2011**



Source: AIHW 2017b; Table S4.4.1.

The lowest socioeconomic area experienced the greatest burden attributable to overweight and obesity, at a rate 2.3 times that of the highest socioeconomic area. There was a clear pattern of decreasing burden with increasing socioeconomic area for both males and females (Figure 4.4.2).

**Figure 4.4.2: Age-standardised DALY rate due to overweight and obesity, by sex and socioeconomic area, 2011**



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

Source: AIHW 2017b; Table S4.4.2.

Around 14% of disease burden due to overweight and obesity in 2020 could be avoided if everyone in the population at risk in 2011 reduced their body mass index (BMI) by 1 (equivalent to around 3 kilograms in a person of average height), and maintained that loss to 2020 (AIHW 2017b). BMI is a commonly used method to determine if a person is normal weight, underweight, overweight or obese and is calculated by dividing the person's weight (in kilograms) by their height (in metres) squared. See Chapter 4.10 'Overweight and obesity' for more information on overweight and obesity.

Even if the current rises in overweight and obesity in the population were halted (by people just maintaining their current weight), an estimated 6.3% of future disease burden due to overweight and obesity could be avoided.



For more scenario modelling results see the online data visualisation tool at [www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/burden-of-disease-scenario-modelling](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/burden-of-disease-scenario-modelling).

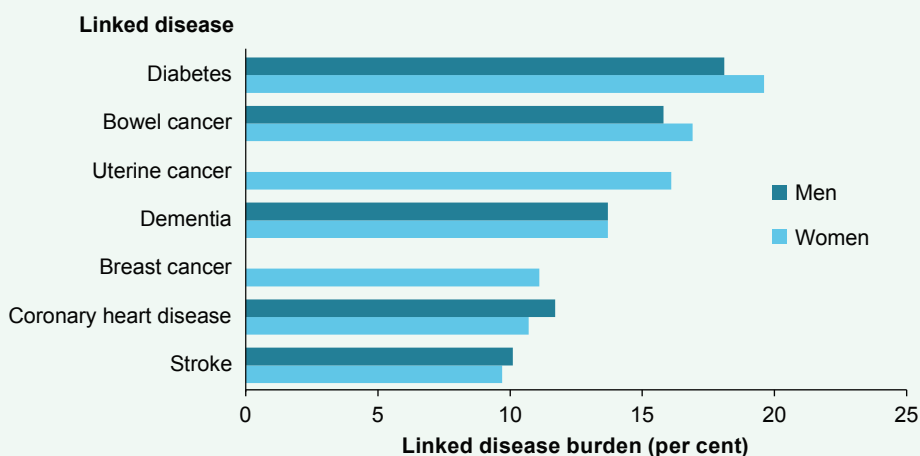
## Insufficient physical activity

Insufficient physical activity is a major risk factor for ill health in Australia, with more than half of adults not meeting the current Australian recommended physical activity guidelines (ABS 2015). Physical activity is an important factor in preventing or reducing overweight and obesity, which is a leading contributor to disease in Australia. Insufficient physical activity increases the risk of a range of diseases, such as cardiovascular disease, type 2 diabetes and some cancers (Kyu et al. 2016).

In 2011, 2.6% of the total disease burden was due to insufficient physical activity in people aged 20 and over. This finding is similar for both men and women. Around 74% of this burden was due to fatal outcomes.

Insufficient physical activity was linked to 7 diseases—coronary heart disease, diabetes, bowel cancer, dementia, stroke, breast cancer, and uterine cancer. It was responsible for between 10% and 20% of disease burden for each of these diseases (Figure 4.4.3).

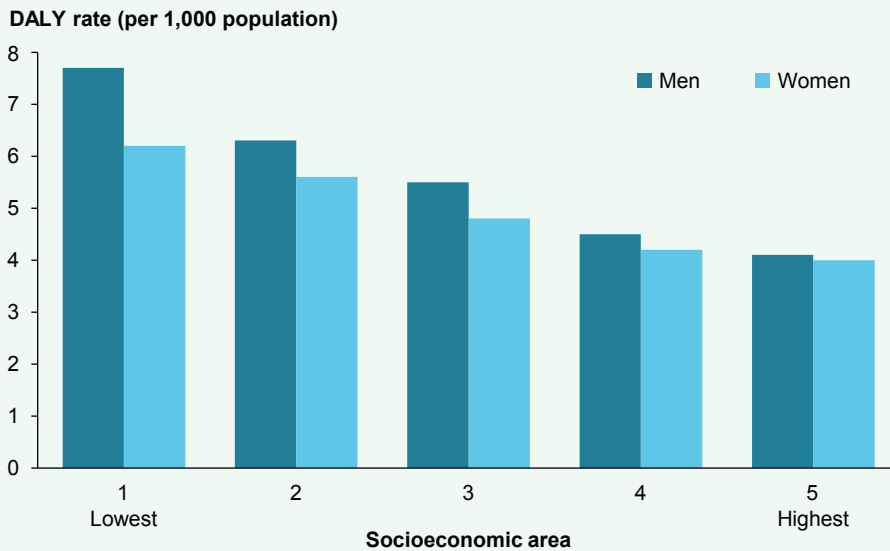
**Figure 4.4.3: Proportion of linked disease burden (DALYs) due to insufficient physical activity for people aged 20 and over, by sex, 2011**



Source: AIHW 2017c; Table S4.4.3.

People in the lowest socioeconomic area experienced rates of disease burden due to insufficient physical activity at 1.7 times those of the highest socioeconomic area. There was a clear pattern of decreasing burden with increasing socioeconomic area for both men and women (Figure 4.4.4).

**Figure 4.4.4: Age-standardised DALY rate due to insufficient physical activity for people aged 20 and over, by sex and socioeconomic area, 2011**



*Note:* Rates were age standardised to the 2001 Australian Standard Population.

*Source:* AIHW 2017c; Table S4.4.4.

An extra 15 minutes of moderate activity (such as brisk walking), 5 days each week by everyone in the population at risk in 2011—maintained over time to 2020—could reduce disease burden due to insufficient physical activity in the population by an estimated 14%. If this activity time were increased to 30 minutes, the burden could be reduced by 26% (AIHW 2017c). All ages would benefit, particularly people aged 65 and over.



For more scenario modelling results see the online data visualisation tool at [www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/burden-of-disease-scenario-modelling](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/burden-of-disease-scenario-modelling).

After taking into account the complex interactions between insufficient physical activity and overweight and obesity, an estimated 9.0% of the total disease burden in 2011 was due to these risk factors combined.

See Chapter 4.8 'Insufficient physical activity' for more information on physical activity.

## Alcohol and illicit drug use

Alcohol and illicit drug use contribute substantially to the health burden in Australia, both on their own as dependency disorders, and as risk factors for other diseases and injuries. They present many risks of immediate and chronic harm to the individual and their families, bystanders and the broader community. Immediate consequences include antisocial behaviour and exposure to violence (including domestic and family violence), traffic accidents, injury, poisoning, crime and trauma (Department of Health 2017; Laslett et al. 2011; NHMRC 2009; Stafford & Burns 2015). Chronic harms include chronic health conditions that may result from alcohol or illicit drug use, such as cardiovascular disease, cancer, mental health problems and dependency disorders (AIHW 2016c). The broader societal and economic impacts—such as antisocial behaviour, crime, productivity losses, costs associated with health care and law enforcement, and harm to families and communities—are not measured in the Australian Burden of Disease Study.

Alcohol and illicit drug use were the two leading risk factors for disease burden in males aged 15–44 in 2011 (AIHW 2016a).

Together, alcohol and illicit drug use were responsible for 6.7% of the total disease burden in Australia in 2011, of which three-quarters was experienced by males. Alcohol and illicit drug use were responsible for 4.5% (6,660) of deaths and a higher proportion of years of life lost (8.1%) due to the relatively young age at which these deaths occurred. These estimates are based on analysis of the combined impact of both risk factors, adjusted for the interaction between them.

### Alcohol use

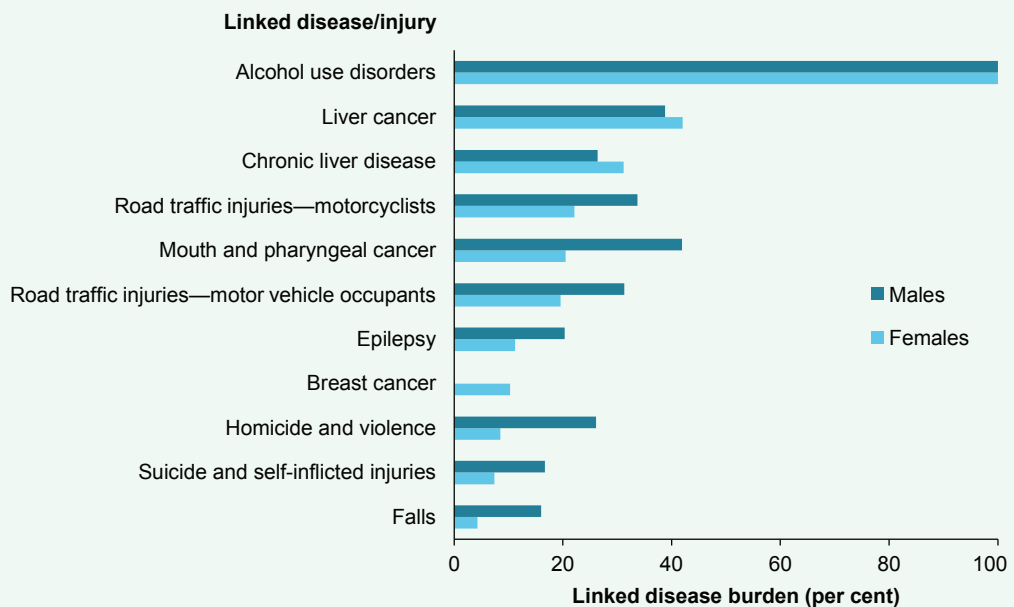
Alcohol use was linked to 26 diseases or injuries (which included alcohol use disorders): 11 types of injury (including suicide and self-inflicted injuries, road traffic injuries—motor vehicle occupants, homicide and violence, and accidental poisoning), 6 types of cancer (including liver, breast, and mouth and pharyngeal cancer), 4 cardiovascular diseases (including stroke, coronary heart disease and hypertensive heart disease), alcohol dependence, chronic liver disease, epilepsy, lower respiratory infections, and pancreatitis.

Alcohol use was responsible for 4.6% of the total disease burden in Australia in 2011, of which three-quarters (73%) was experienced by males. Around 59% of the burden attributable to alcohol use was due to fatal outcomes; however, this varied by age, sex and linked disease.

Alcohol use was responsible for 100% of the burden due to alcohol dependence, 37% of the mouth and pharyngeal cancer burden, between 30% and 35% of the burden due to different types of road traffic injuries, and 23% of the homicide and violence burden (Figure 4.4.5).



**Figure 4.4.5: Proportion of linked disease burden (DALYs) due to alcohol use for people aged 15 and over, by sex and selected linked diseases or injuries, 2011**



Source: AIHW 2018b; Table S4.4.5.

The lower the socioeconomic area, the higher the rate of burden attributable to alcohol use. The lowest socioeconomic area experienced rates of burden attributable to alcohol use that were 1.9 times those of the highest socioeconomic area.

There was also a clear pattern of increasing attributable burden with increasing remoteness, with *Very remote* areas experiencing 2.4 times the rate of burden attributable to alcohol use as *Major cities* (AIHW 2018b).

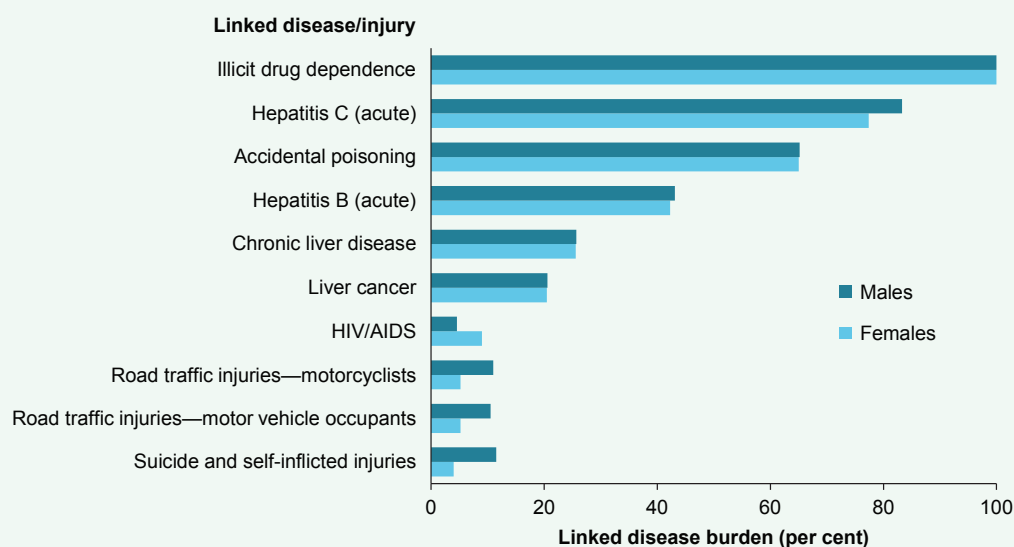
## Illicit drug use

Illicit drug use—which includes opioids (such as heroin and prescription opioids), amphetamines, cannabis, cocaine and other illicit drugs, as well as unsafe injecting practices—was linked to 13 diseases and injuries: drug use disorders, chronic liver disease, hepatitis B, hepatitis C, liver cancer, suicide and self-inflicted injury, human immunodeficiency virus (HIV)/acquired immune deficiency syndrome (AIDS), accidental poisoning, road traffic injuries—motorcyclists, road traffic injuries—motor vehicle occupants, depressive disorders, schizophrenia, and anxiety disorders.

Overall, illicit drug use was responsible for 2.3% of the total burden of disease and injury in Australia in 2011, of which three-quarters (75%) was experienced by males. More than two-thirds (69%) of the burden attributable to illicit drug use was due to fatal burden; however, this varied by age, sex and linked disease.

Illicit drug use was responsible for 65% of the accidental poisoning burden. For other linked diseases, illicit drug use was responsible for 42% of hepatitis B burden, 26% of chronic liver disease burden, and 21% of liver cancer burden (Figure 4.4.6).

Figure 4.4.6: Proportion of linked disease burden (DALYs) due to illicit drug use for people aged 15 and over, by sex and selected linked diseases or injuries, 2011



Source: AIHW 2018b; Table S4.4.6.

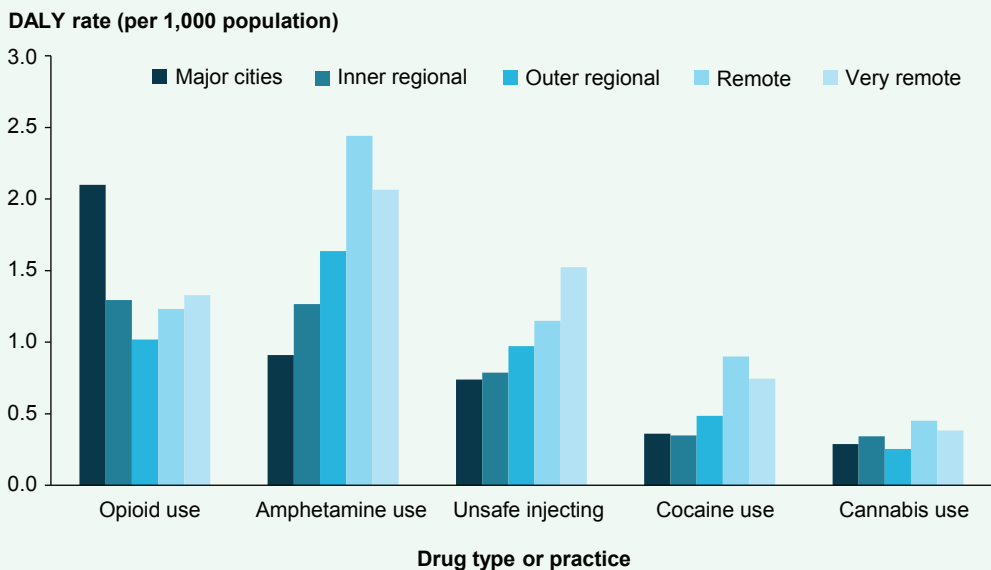
The majority of the burden due to illicit drug use was from opioid use (41%), followed by amphetamine use (18%). As well, 18% was from diseases contracted through unsafe injecting practices. Cocaine use and cannabis use accounted for a further 8.0% and 6.6%, respectively.

Opioid use was responsible for around half (52%) of the total disease burden due to accidental poisoning. Amphetamine use was responsible for around 7.5% of the total burden of road traffic injuries. One-quarter (26%) of the burden of chronic liver disease and one-fifth (21%) of liver cancer disease burden was a result of unsafe injecting practices.

There was a clear pattern of increasing attributable burden due to illicit drug use with decreasing socioeconomic area. The lowest socioeconomic area experienced rates of burden attributable to illicit drug use that were 2.6 times those of the highest socioeconomic area.

There was a general pattern of increasing attributable burden with increasing remoteness, for amphetamine use, unsafe injecting practices and cocaine use. For cannabis use, there was no clear pattern by remoteness in rates of attributable burden (Figure 4.4.7). For opioid use, the rate in *Major cities* was 1.6 to 2 times as high as those for other remoteness areas.

**Figure 4.4.7: Age-standardised DALY rate due to drug use for people aged 15 and over, by drug type or practice and remoteness area, 2011**



*Note:* Rates were age standardised to the 2001 Australian Standard Population.

*Source:* AIHW 2018b; Table S4.4.7.

See Chapter 3.17 ‘Opioid harm’; chapters 4.6 ‘Alcohol risk and harm’, 4.7 ‘Illicit drug use’ for more information on alcohol and drug use in Australia.

## Intimate partner violence

Intimate partner violence is an important public health issue that can have substantial social, economic and health impacts (AIHW 2018a). Around 1 in 4 (23%) women experienced violence by an intimate partner in 2016, compared with 1 in 13 (7.8%) men (ABS 2017). The seriousness of this issue prompted the development of The National Plan to Reduce Violence against Women and their Children 2010–2022. The Plan aims to ensure that fewer women experience violence and that more women and children can live safely (COAG 2011).

Intimate partner violence was associated with 7 diseases or injuries: depressive disorders, anxiety, early pregnancy loss, suicide and self-inflicted injuries, homicide and violence, alcohol use disorders, and preterm birth and low birthweight complications (AIHW 2016a).

An estimated 1.4% of the total disease burden in 2011 was attributable to physical/sexual intimate partner violence by the current or previous cohabiting partner of women aged 18 and over. This increased to 2.0% when intimate partner violence by non-cohabiting partners was included (Ayre et al. 2016).

Anxiety disorders made up the greatest proportion of this attributable burden (37%), followed by depressive disorders (33%) and suicide and self-inflicted injuries (20%).

See Chapter 3.16 ‘Family, domestic and sexual violence’ for more information on intimate partner violence in Australia.

## Diabetes and chronic kidney disease as risk factors for other diseases

Diseases such as diabetes and CKD are increasingly common in Australia, in part due to changing lifestyle and behaviour, and an ageing population. These and other diseases can also act as risk factors for other diseases (referred to as linked diseases, see Box 4.4.1). For example, diabetes can increase the risk of coronary heart disease, stroke, peripheral vascular disease and dementia (Cheng et al. 2014; Emerging Risk Factors Collaboration 2010; Prince et al. 2014; Vigneri et al. 2009).

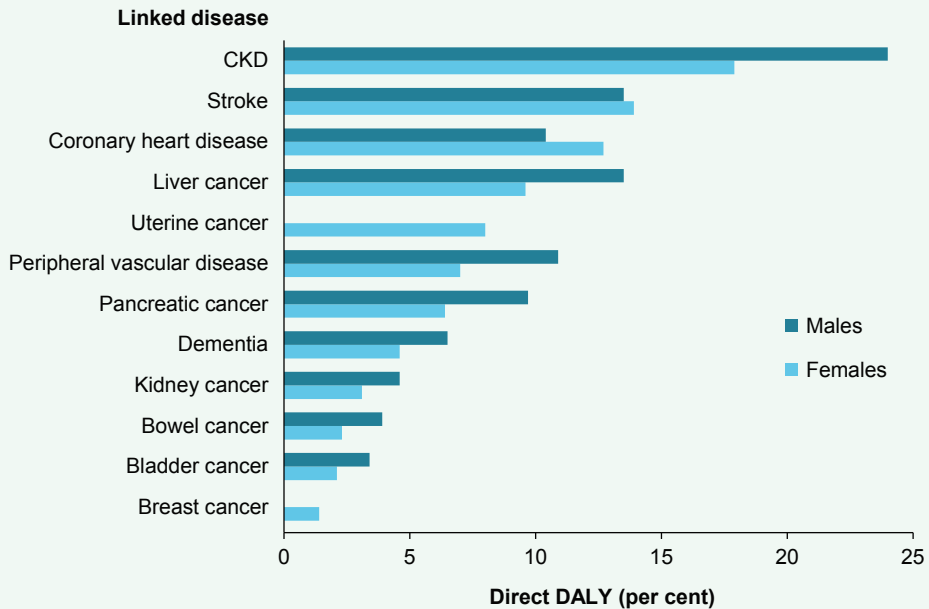
The burden of each disease, as calculated in the ABDS 2011, captured the 'direct' disease burden. For example, the direct burden of diabetes is the burden most closely related to diabetes, such as diagnosed diabetes, diabetic neuropathy and retinopathy. To fully account for the health loss attributable to diabetes, the 'indirect' or additional burden from diseases linked to diabetes must also be calculated. This includes the proportion of burden of linked diseases caused by other diabetes complications (for example, coronary heart disease and stroke). To estimate the collective burden, the direct and indirect burden are added.

This section focuses on diabetes and CKD as risk factors for other diseases, as they are increasingly common in Australia and have major impacts on health and other support services.

The ABDS 2011 reported that diabetes and CKD were responsible for 2.3% and 0.9%, respectively, of the total burden of disease and injury in Australia in 2011 (the direct burden). When the indirect burden due to linked diseases was taken into account, the burden due to either diabetes or CKD doubled (the collective burden) (4.2% for diabetes and 2.0% for CKD).

Diabetes was responsible for 21% of the CKD burden, 14% of the stroke burden and 11% of the coronary heart disease burden (Figure 4.4.8). Males had a larger proportion of disease burden attributable to diabetes for all linked diseases, except coronary heart disease and stroke.

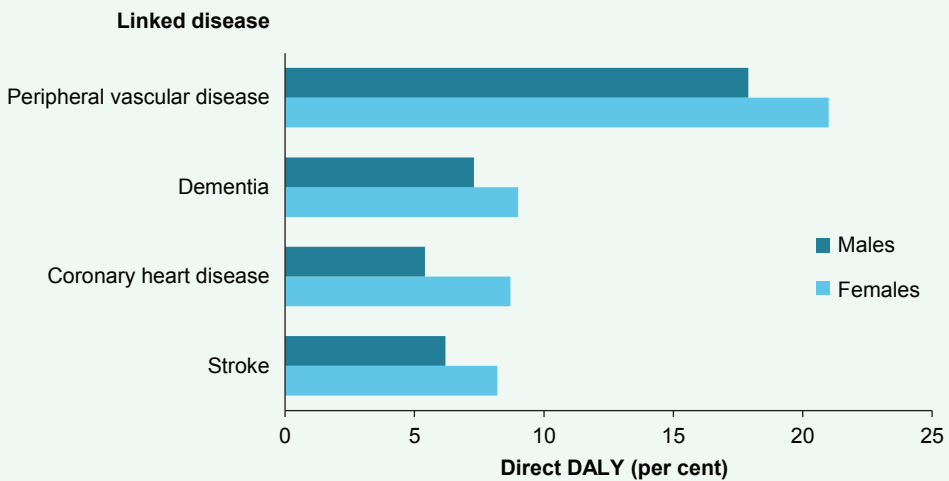
**Figure 4.4.8: Proportion of burden (DALYs) attributable to diabetes, by sex and linked disease, 2011**



Source: AIHW 2016d; Table S4.4.8.

CKD was responsible for 19% of peripheral vascular disease burden, 8.4% of dementia burden and 7.2% of stroke burden (Figure 4.4.9). A larger proportion of disease burden was attributable to CKD in females in every linked disease.

**Figure 4.4.9: Proportion of burden (DALYs) attributable to CKD, by sex and linked disease, 2011**



Source: AIHW 2016d; Table S4.4.9.

Scenario modelling analysis showed that, in 2020, around one-fifth (21%) of future diabetes burden, and 4.8% of future CKD burden could be avoided if the current rise in these diseases were halted (AIHW 2016d).

See chapters 3.8 'Diabetes', 3.9 'Chronic kidney disease' for more information on diabetes and CKD in Australia.

## What is the AIHW doing?

The AIHW is currently updating Australia's burden of disease estimates to the 2015 reference year; results are expected to be released in early 2019. This will include updated information on the burden due to different diseases and risk factors in Australia, such as those described in this article. As part of this work, the AIHW will be including disease expenditure estimates to align with burden of disease categories, to enable health system expenditure and corresponding disease burden to be compared.

## What is missing from the picture?

While the studies described here add important information about the contribution of certain risk factors to the burden of disease in the Australian population, there are still gaps which, if filled, could improve current insights. For instance, the burden of risk factors such as insufficient physical activity and alcohol and illicit drugs could not be estimated in children due to a lack of evidence on their association with diseases in younger ages. The full impact that overweight and obesity in children has on disease burden in adulthood is also currently unknown.

## Where do I go for more information?

More information on the Australian Burden of Disease Study is available at <[www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/burden-of-disease/overview](http://www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/burden-of-disease/overview)>. The report *Australian Burden of Disease Study: impact and causes of illness and death in Australia 2011* and other recent releases are available for free download.

## References

- ABS (Australian Bureau of Statistics) 2015. National Health Survey: first results, 2014–15. ABS cat. no. 4364.0.55.001. Canberra: ABS.
- ABS 2017. Personal safety, Australia, 2016. ABS cat. no. 4906.0. Canberra: ABS.
- AIHW (Australian Institute of Health and Welfare) 2016a. Australian Burden of Disease Study: impact and causes of illness and death in Australia 2011. Australian Burden of Disease Study series no. 3. Cat. no. BOD 4. Canberra: AIHW.
- AIHW 2016b. Australian Burden of Disease Study 2011: methods and supplementary material. Australian Burden of Disease Study series no. 5. Cat. no. BOD 6. Canberra: AIHW.
- AIHW 2016c. Australia's health 2016. Australia's health series no. 15. Cat. no. AUS 199. Canberra: AIHW.
- AIHW 2016d. Diabetes and chronic kidney disease as risks for other diseases: Australian Burden of Disease Study 2011. Australian Burden of Disease Study series no. 8. Cat. no. BOD 9. Canberra: AIHW.
- AIHW 2017a. A picture of overweight and obesity in Australia 2017. Cat. no. PHE 216. Canberra: AIHW.
- AIHW 2017b. Impact of overweight and obesity as a risk factor for chronic conditions: Australian Burden of Disease Study. Australian Burden of Disease Study series no. 11. Cat. no. BOD 12. Canberra: AIHW.

- AIHW 2017c. Impact of physical inactivity as a risk factor for chronic conditions: Australian Burden of Disease Study. Australian Burden of Disease Study series no. 15. Cat. no. BOD 16. Canberra: AIHW.
- AIHW 2018a. Family, domestic and sexual violence in Australia 2018. Cat. no. FDV 2. Canberra: AIHW.
- AIHW 2018b. Impact of alcohol and illicit drug use on the burden of disease and injury in Australia: Australian Burden of Disease Study 2011. Australian Burden of Disease Study series no. 17. Cat no. BOD 19. Canberra: AIHW.
- Ayre J, Lum On M, Webster K, Gourley M & Moon L 2016. Examination of the burden of disease of intimate partner violence against women in 2011: final report (ANROWS Horizons, 06/2016). Sydney: ANROWS.
- Cheng D, Fei Y, Liu Y, Li J, Xue Q, Wang X et al. 2014. HbA1C variability and the risk of renal status progression in diabetes mellitus: a meta-analysis. *Plos One* 9:e115509.
- COAG (Council of Australian Governments) 2011. The National Plan to Reduce Violence against Women and their Children: including the first three-year action plan. Canberra: Department of Families, Housing, Community Services and Indigenous Affairs.
- Department of Health 2017. The National Drug Strategy 2017–2026. Canberra: Department of Health.
- Emerging Risk Factors Collaboration 2010. Diabetes mellitus, fasting blood glucose concentration and risk of vascular disease: a collaborative meta-analysis of 102 prospective studies. *The Lancet* 375:2215–22.
- Kyu HH, Bachman VF, Alexander LT, Mumford JE, Afshin A, Estep K et al. 2016. Physical activity and risk of breast cancer, colon cancer, diabetes, ischemic heart disease, and ischemic stroke events: systematic review and dose-response meta-analysis for the Global Burden of Disease Study 2013. *BMJ* 354:i3857.
- Laslett A, Room R & Ferris J 2011. Surveying the range and magnitude of alcohol's harm to others in Australia. *Addiction* 106(9):1603–11.
- NHMRC (National Health and Medical Research Council) 2009. Australian guidelines to reduce health risks from drinking alcohol. Canberra: NHMRC.
- Prince M, Albanese E, Guerchet M & Prina M 2014. World Alzheimer report 2014—dementia and risk reduction: an analysis of protective and modifiable factors. London: Alzheimer's Disease International.
- Stafford J & Burns L 2015. Australian drug trends 2014. Findings from the Illicit Drugs Reporting System (IDRS). Australian Drug Trends 2014 no. 127. Sydney: National Drug and Alcohol Research Centre, University of New South Wales.
- Vigneri P, Frasca F, Sciacca L, Pandini G & Vigneri R 2009. Diabetes and cancer. *Endocrine-Related Cancer* 16:1103–23.

# 4.5 Tobacco smoking

## The decline in daily smoking has slowed

Successful public health strategies over several decades have seen daily smoking rates in Australia decline. The National Drug Strategy Household Survey showed that the daily smoking rates halved between 1991 and 2016 (from 24% to 12%). However, there was no decline between 2013 and 2016 (AIHW 2017).

## The majority of daily smokers are aged 40 and over

People aged 40–49 continued to be the age group most likely to smoke daily (16.9%) and no improvement in the smoking rate was seen for this group in 2016 (16.2% in 2013 and 16.9% in 2016).

The population of smokers is ageing and the majority (57%) of daily smokers in 2016 were aged 40 and over—different from the trend 15 years ago when the majority were aged 14–39. Long-term reductions in smoking have been largely driven by fewer people ever taking up smoking. Between 2001 and 2016, the proportion of people who reported never smoking rose from 51% to 62% (AIHW 2017).

## Some groups are making positive changes

Considerable progress towards reducing smoking continued to be made among teenagers—the proportion of teenagers who were current smokers (people who reported smoking daily, weekly or less than weekly) declined from 5.0% in 2013 to 2.1% in 2016. Young people also continued to delay the uptake of smoking, with the average age at which people aged 14–24 smoked their first full cigarette increasing from 14.3 years in 2001 to 16.3 years in 2016 (a significant increase from 15.9 years in 2013).

There were also fewer people being exposed to tobacco smoke: the proportion of dependent children exposed to tobacco smoke inside the home continued to decline, from 3.7% in 2013 to 2.8% in 2016 (a dramatic fall from 31% in 1995), and the proportion of pregnant women smoking during their pregnancy declined from 15% in 2009 to 10% in 2015.

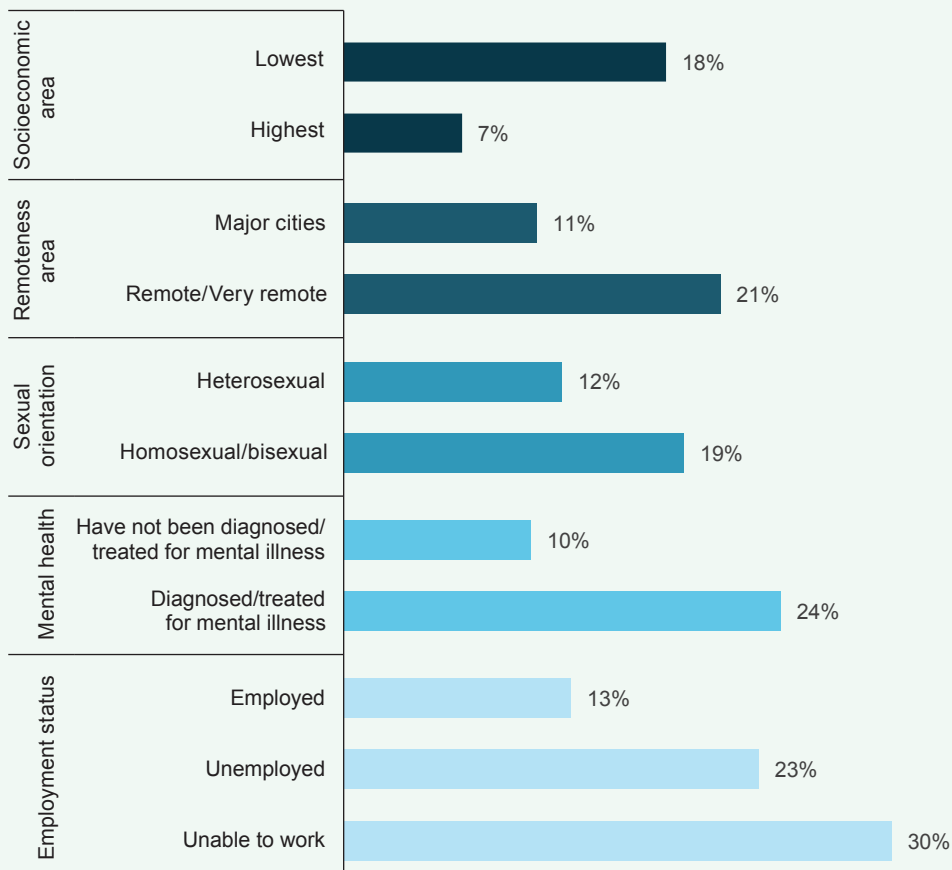
People living in the lowest socioeconomic area were one of the few groups to report a decline in daily smoking between 2013 and 2016—from 20% to 18%—but they still have a much higher smoking rate than people living in the highest socioeconomic area (6.5%) (AIHW 2017).



# Some groups are more likely to smoke daily than others

Good health is not shared equally among people in Australia and smoking is one example of a key risk factor for disease that contributes to these inequalities. Although some improvements are being made among these groups, daily smoking continues to be more commonly reported among Aboriginal and Torres Strait Islander people (see Chapter 6.5 'Health behaviours of Indigenous Australians'), people living in the lowest socioeconomic area, people identifying as homosexual/bisexual, and people who were unable to work or were unemployed (Figure 4.5.1).

**Figure 4.5.1: Proportion of people who are daily smokers, by selected demographic characteristics, 2016**



Source: AIHW 2017; Table S4.5.1.

## Most smokers want to quit

According to the National Drug Strategy Housing Survey 2016, 7 in 10 (69%) current smokers planned to quit smoking and 3 in 10 (29%) tried to quit in the previous 12 months but did not succeed. The main reason smokers tried to quit or change their smoking behaviour was because it was costing too much money (52%).

## Smoking is the leading risk factor for disease

Tobacco smoking is the leading preventable cause of death and disease in Australia and a leading risk factor for many chronic conditions.

The Australian Burden of Disease Study estimated that tobacco use contributed to almost 18,800 deaths in 2011—more than 1 in every 8 (13%) deaths. Taking into account illness as well as deaths, tobacco use caused more disease and injury burden in Australia than any other single risk factor and was responsible for 9.0% of the total burden of disease. The largest impact from tobacco use is on cancer, respiratory diseases and cardiovascular disease.

The total burden attributable to tobacco use was only slightly lower (0.2%) in 2011 than in 2003 (equivalent to an 18% decline in the age-standardised rate), despite reductions in tobacco use and exposure over this period. This may be because health improvements from reductions in tobacco use take longer to become evident in cancer and chronic respiratory diseases (for which burden rates are still increasing) than in cardiovascular disease (for which there has been a large decrease in burden) (AIHW 2016).

## Smokers have poorer health than non-smokers

In 2016, smokers were less likely to rate their health as 'excellent' than people who had never smoked (8.3% compared with 22%) and were more likely than people who had never smoked to self-report being diagnosed with, or treated for, a mental illness in the previous 12 months (28% compared with 12% for people who had never smoked). The proportion of smokers self-reporting a mental illness also increased—both in recent years (from 21% in 2013), and over the last decade (17% in 2007).

The mechanisms linking tobacco smoking with mental health problems are complex; however, it is understood that people may perceive that smoking helps to relieve or manage psychiatric symptoms of their disorder (Minichino et al. 2013). It has also been shown that people with mental health conditions may find it difficult to stop smoking; however, on quitting, they are likely to experience improvements in their mood, general wellbeing, mental health and quality of life (Greenhalgh et al. 2016).

A high proportion of smokers also drink alcohol in risky quantities (49% exceeded the lifetime or single-occasion risk guidelines in 2016) and use illicit drugs (36% had used at least one illicit drug in the previous 12 months). Risky alcohol consumption and illicit drug use are both risk factors that increase the likelihood of a person's developing a disease or health disorder.

## What is missing from the picture?

There are limited national data available on how and why people quit smoking, and how they successfully maintained quitting. Most survey questions related to changes in behaviour or stopping smoking are targeted at smokers not ex-smokers.

There are currently no regular data collections on smoking prevalence among homeless people or on the relationship status of household smokers (for example, parent or sibling).

## Where do I go for more information?

More information on tobacco smoking is available at <[www.aihw.gov.au/reports-statistics/behaviours-risk-factors/smoking/overview](http://www.aihw.gov.au/reports-statistics/behaviours-risk-factors/smoking/overview)>. The reports *National Drug Strategy Household Survey 2016: detailed findings* and *Tobacco indicators: measuring midpoint progress—reporting under the National Tobacco Strategy 2012–2018* and other recent releases are available for free download.

More information on the Australian Burden of Disease Study is available at <[www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/burden-of-disease/overview](http://www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/burden-of-disease/overview)>. The report *Australian Burden of Disease Study: impact and causes of illness and death in Australia 2011* and other recent releases are available for free download.

## References

AIHW (Australian Institute of Health and Welfare) 2016. Australian Burden of Disease Study: impact and causes of illness and death in Australia 2011. Australian Burden of Disease Study series no. 3. Cat. no. BOD 4. Canberra: AIHW.

AIHW 2017. National Drug Strategy Household Survey 2016: detailed findings. Drug statistics series no. 31. Cat. no. PHE 214. Canberra: AIHW.

Greenhalgh EM, Stillman S & Ford C 2016. Smoking and mental health. In: Scollo MM & Winstanley MH (eds). Tobacco in Australia: facts and issues. Melbourne: Cancer Council Victoria. Viewed 12 January 2018, <<http://www.tobaccoinaustralia.org.au/chapter-7-cessation/7-12-smoking-and-mental-health>>.

Minichino A, Bersani FS, Calo WK, Spagnoli F, Francesconi M, Vicinanza R et al. 2013. Smoking behaviour and mental health disorders—mutual influences and implications for therapy. *International Journal of Environmental Research and Public Health* 10(10):4790–811.

## 4.6 Alcohol risk and harm

The consumption of alcohol is widespread in Australia and associated with many social and cultural activities. While most Australians drink alcohol at levels that cause few harmful effects, a large proportion drink at levels that increase their risk of harm— affecting not only themselves but also families, bystanders and the broader community (NHMRC 2009). The latest estimate of the social costs of alcohol abuse in Australia was slightly more than \$14 billion—through productivity losses, traffic accidents, crime and health care costs (Manning et al. 2013).

### Trends in alcohol consumption in Australia

The overall volume of alcohol consumed by people in Australia increased from the equivalent of 9.5 litres of pure alcohol per person in 2014–15 to 9.7 litres in 2015–16. However, this is lower than the 9.8 litres recorded in 2013–14 (ABS 2017).

The National Drug Strategy Household Survey (NDSHS) 2016 found that slightly more than 3 in 4 (77%) Australians consumed alcohol in the previous 12 months. The NDSHS data reveal several changes in drinking patterns compared with those for 2013, including that:

- people are drinking less often—daily and weekly drinking rates have declined
- fewer young people aged 12–17 are drinking alcohol and the proportion abstaining from alcohol has increased
- people aged 14–24 are delaying starting to drink—the average age at which they first tried alcohol has increased
- fewer people are exceeding the lifetime risk guideline (Table 4.6.1).

**Table 4.6.1: Significant changes in drinking behaviours, 2013 and 2016**

Drinking behaviours	2013	2016
Drank alcohol daily (14 years and over)	6.5%	5.9%
Drank alcohol weekly (14 years and over)	37.3%	35.8%
Drank alcohol less often than weekly (14 years and over)	34.5%	35.8%
Abstained from alcohol (12–17 years)	72.3%	81.5%
Age when had first full serve of alcohol (14–24 years)	15.7 years	16.1 years
Exceeded lifetime risk guidelines (14 years and over)	18.2%	17.1%

Source: AIHW 2017.

These changes are positive; however, the proportion exceeding the single occasion risk guideline (see Box 4.6.1) at least once a month remained unchanged (at about 26%) as did the proportion consuming 11 or more standard drinks in one single drinking occasion in the past year (at about 15%).

### Box 4.6.1: Summary of the Australian Guidelines to Reduce Health Risks from Drinking Alcohol

The National Health and Medical Research Council publishes guidelines for reducing health risks of drinking alcohol. The data for alcohol risks in this report are reported against the following two guidelines:

- Guideline 1 (lifetime risk): To reduce the risk of alcohol-related harm over a lifetime (such as chronic disease or injury), a healthy adult should drink no more than two standard drinks a day
- Guideline 2 (single occasion risk): To reduce the risks of injury on a single occasion of drinking, a healthy adult should drink no more than four standard drinks on any one occasion (NHMRC 2009).

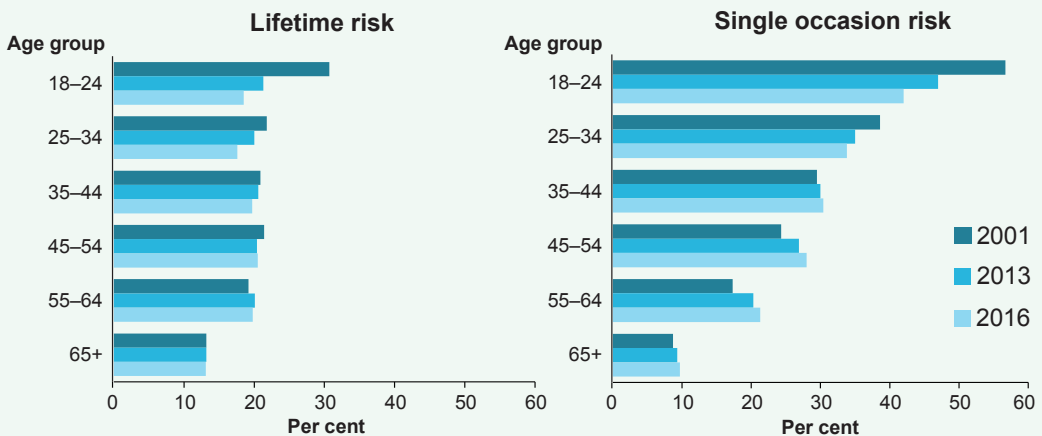
The data presented relates to the proportion of people exceeding the single occasion risk guidelines once a month or more often.

## Young people drinking less but no change among older people

Young adults (aged 18–24) historically consume alcohol at higher rates for both lifetime and single occasion risk than any other age group (see Box 4.6.1 for definitions of risk). Overall trends since 2001 show, however, that while patterns for older age groups remained stable (or rates increased in some cases), rates among young people drinking in excess of guidelines for lifetime risk and single occasion risk declined (Figure 4.6.1).

In 2016, young adults remained the group most likely to drink in excess of single occasion risk guidelines but the rates of lifetime risky drinking were similar across all age groups (about 1 in 5) except for those aged 65 and over, where the rate was lower (13%).

Figure 4.6.1: Exceeded lifetime and single occasion risk, people aged 18 and over, by age group, 2001, 2013 and 2016



Note: See Box 4.6.1 for definitions of lifetime and single occasion risk.

Source: AIHW 2017; Table S4.6.1.

## Impact of alcohol consumption

Alcohol use was estimated to be responsible for 4.6% of the total burden of disease and injury and 3.4% of deaths (more than 5,000 deaths) in Australia in 2011, based on revised estimates from the Australian Burden of Disease Study 2011 (AIHW 2018).

See Chapter 4.4 'Contribution of selected risk factors to burden of disease' for more information on the burden due to alcohol use.

## Hospitalisation and treatment

Over the 5 years from 2011–12 to 2015–16, the number and rate of hospitalisations in Australia with a drug-related principal diagnosis of alcohol use increased. In 2015–16, there were 68,000 hospital separations (representing 0.5% of all hospital separations) where alcohol was the drug-related principal diagnosis—an increase from 62,000 separations in 2011–12 (or from 275 to 284 hospitalisations per 100,000 population) (supplementary tables S4.6.2, S4.6.3).

The number of closed episodes provided in publicly funded alcohol and other drug treatment agencies across Australia for a person's own drug use (where alcohol was the principal drug of concern) fell between 2012–13 and 2016–17 (from 64,000 to 62,000 episodes). As a proportion, this equates to a decline from 41% to 32% of total episodes of treatment. See Chapter 7.19 'Specialised alcohol and other drug treatment services' for more information.

## Alcohol-related incidents and harm

Excessive consumption of alcohol increases the risk of people putting themselves and others at risk of harm (AIHW 2017). The NDSHS showed that, in 2016 almost 1 in 6 (17%) recent drinkers aged 14 and over put themselves or others at risk of harm while under the influence of alcohol in the previous 12 months—significantly down from 21% in 2013. In 2016, the most likely risky activity undertaken while under the influence of alcohol was driving a motor vehicle (9.9% of recent drinkers). Overall, more than 1 in 5 (22%) Australians had been a victim of an alcohol-related incident in 2016—down from 26% in 2013. Between 2013 and 2016, verbal abuse (22% and 19%, respectively), being put in fear (13% and 11%) and physical abuse (8.7% and 7.3%) all declined.

## What is missing from the picture?

Data on self-reported alcohol consumption are likely to produce an underestimate of the total amount of alcohol consumed in Australia (Livingston & Callinan 2015). While wholesale data are an alternative measure of consumption, these data cannot identify individual drinking levels and the number of drinkers exceeding the recommended alcohol guidelines. Alcohol consumption data based on wholesale data are also likely to be an overestimate as no adjustments are made for alcohol used in the preparation of food or discarded as waste. The estimates are also generally only available at the national level as estimates at the state or regional level are not available for all jurisdictions.

## Where do I go for more information?

More information on alcohol consumption and harm in Australia is available at <[www.aihw.gov.au/reports-statistics/behaviours-risk-factors/alcohol/overview](http://www.aihw.gov.au/reports-statistics/behaviours-risk-factors/alcohol/overview)>. The report *National Drug Strategy Household Survey 2016: detailed findings* and other recent releases are available for free download.

More information on the Australian Burden of Disease Study is available at <[www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/burden-of-disease/overview](http://www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/burden-of-disease/overview)>. The report *Impact of alcohol and illicit drug use on the burden of disease and injury in Australia: Australian Burden of Disease Study 2011* and other recent releases are available for free download.

## References

ABS (Australian Bureau of Statistics) 2017. Apparent consumption of alcohol, Australia, 2015–16. ABS cat. no. 4307.0.55.001. Canberra: ABS.

AIHW (Australian Institute of Health and Welfare) 2017. National Drug Strategy Household Survey 2016: detailed findings. Drug statistics series no. 31. Cat. no. PHE 214. Canberra: AIHW.

AIHW 2018. Impact of alcohol and illicit drug use on the burden of disease and injury in Australia: Australian Burden of Disease Study 2011. Australian Burden of Disease Study series no.17.

Livingston M & Callinan S 2015. Underreporting in alcohol surveys: whose drinking is underestimated? *Journal of Studies on Alcohol and Drugs* 76(1):158–164.

Manning M, Smith S & Mazerolle P 2013. The societal costs of alcohol misuse in Australia. *Trends & Issues in Crime and Criminal Justice* 454. Canberra: Australian Institute of Criminology.

NHMRC (National Health and Medical Research Council) 2009. Australian Guidelines to Reduce Health Risks from Drinking Alcohol. Canberra: NHMRC.

## 4.7 Illicit drug use

Harms from illicit drugs affect all Australian communities, families and individuals, either directly or indirectly. These harms are numerous and include health impacts such as injury, poisoning and mental illness; social impacts such as violence, crime and trauma; and economic impacts such as related costs of health care and law enforcement (Department of Health 2017).

Since 1985, there has been a coordinated approach to dealing with licit and illicit drug use in Australia. Illicit drug policy is the responsibility of all levels of government and various government agencies. The National Drug Strategy 2017–2026 is the latest cooperative strategy to recognise that illicit drug use is a health and social issue, while acknowledging the role of law enforcement to detect and deter drug crime (Department of Health 2017).

The first part of this article profiles illicit drug use (see Box 4.7.1 for a definition) and examines the four most commonly used illicit drugs: cannabis, cocaine, ecstasy and meth/amphetamines. The second part considers the relationship between illicit drug use and mental health across various age groups and by sociodemographic characteristics (see Chapter 3.12 'Mental health' for more information on mental health).

### Box 4.7.1: Definition of illicit drug use

'Illicit use of drugs' covers the use of a broad range of substances, including:

- illegal drugs—drugs prohibited from manufacture, sale or possession in Australia, including cannabis (non-medical use, see Box 4.7.2), cocaine, heroin and amphetamine-type stimulants
- pharmaceuticals—drugs available from a pharmacy, over-the-counter or by prescription, which may be subject to misuse (when used for purposes, or in quantities, other than for the medical purposes for which they were prescribed)—for example, opioid-based pain relief medications, opioid substitution therapies, benzodiazepines, steroids, and over-the-counter codeine (not available since 1 February 2018 but it was when data were collected for the National Drug Strategy Household Survey—NDSHS)
- other psychoactive substances—legal or illegal, potentially used in a harmful way—for example, kava; synthetic cannabis and other synthetic drugs; or inhalants such as petrol, paint or glue (MCDS 2011).

Each data collection cited in this article uses a slightly different definition of illicit drug use; see the relevant report for information.



# Impact of illicit drug use

According to the AIHW report *Impact of alcohol and illicit drug use on the burden of disease and injury in Australia* (AIHW 2018b), illicit drug use contributed to 2.3% of the total burden of disease and injury in 2011. This included the impact of opioids, amphetamines, cannabis, cocaine and other illicit drugs, as well as injecting drug use. One-third (33%) of the burden was from accidental poisoning. A further 31% was from drug dependence (see Chapter 4.4 'Contribution of selected risk factors to burden of disease').

Drug use disorders accounted for a large proportion of burden for ages 25–44: for men, it was the eighth leading cause of burden, contributing to 3.2% of burden in this age group (AIHW 2018b). Around 89% of the burden due to drug use disorders was non-fatal and a higher amount of burden was experienced by men (72%) than women (28%).

Mental and substance use disorders (bipolar affective disorder, anxiety, substance use, behavioural and developmental disorders, schizophrenia and intellectual disability) includes disorders associated with alcohol and other drug use, as well as mental health issues that occur independently of substance use. In Australia in 2011, mental and substance use disorders:

- were responsible for an estimated 12% of the total disease burden, making it the third most burdensome group of diseases—together with musculoskeletal conditions (also 12%)—behind cancer (19%), and cardiovascular disease (15%)
- were the leading cause of non-fatal burden, accounting for almost one-quarter (24%) of all years spent living with disease
- were the main causes of burden for late childhood, adolescence and adulthood to age 44
- account for more years of life lost due to disability than any other disorders (AIHW 2016).

## Harms from illicit drug use

The number of drug-induced deaths and hospitalisations with a drug-related principal diagnosis has increased over recent years in Australia.

### Drug-induced deaths

Drug-induced deaths are defined as those that can be directly attributable to drug use from toxicology and pathology reports. This includes overdoses (accident or suicide) or where drugs were found to be a direct contributor to the death, such as where a person was involved in a traffic accident and under the influence of drugs at the time of death (ABS 2017).

In 2016, there were 1,808 drug-induced deaths, equating to 1.1% of all deaths (ABS 2017)—the highest number of drug-induced deaths recorded over the past 20 years. It is similar to the peak in 1999 of 1,740 deaths, which, at that time, was largely due to an increase in heroin-related deaths. However, the death rate per capita of 7.5 per 100,000 population in 2016 is lower than it was in 1999, when it was 9.2 deaths per 100,000.

The most common drug class identified in data for drug-induced deaths over the past decade was opioids (this drug class includes the illegal use of heroin and licit and illicit use of opiate-based analgesics—such as codeine, oxycodone and morphine—and synthetic opioid prescriptions—such as tramadol, fentanyl and methadone).

Between 1999 and 2016, there was a 4-fold increase in the number and rate of meth/amphetamine deaths, from 0.4 to 1.6 deaths per 100,000 population (ABS 2017).

## Drug-related hospitalisations

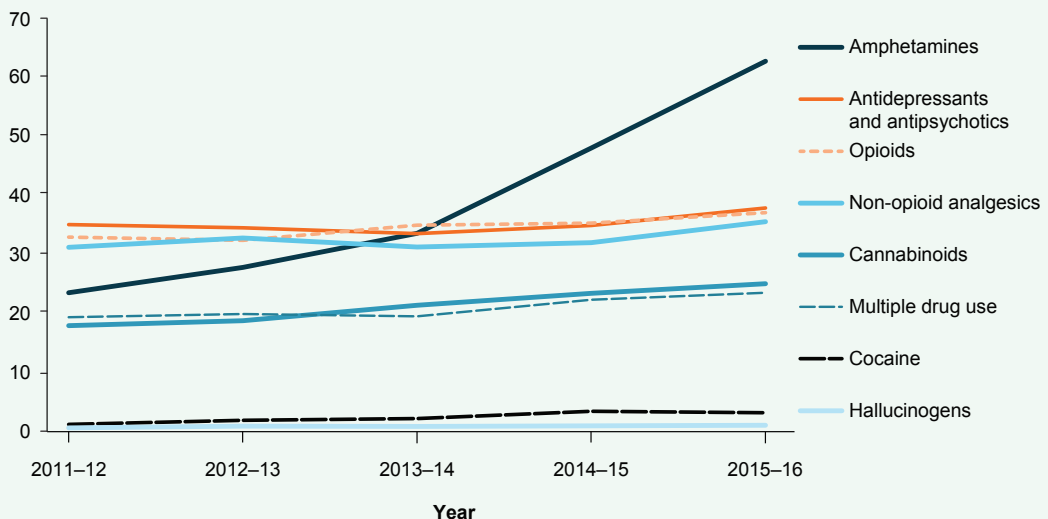
The National Hospital Morbidity Database contains information on drug-related hospitalisations. (This database includes all separations of admitted patients from public and private hospitals in Australia.) Drug-related separations refer to hospital care with selected principal diagnoses of a substance misuse disorder or harm.

In 2015–16, 0.5% of the 10.6 million separations in Australia's public and private hospitals had a drug-related (excluding alcohol) principal diagnosis.

The total number and rate of drug-related (excluding alcohol) hospitalisations has gradually risen over the last 5 years from around 38,300 in 2011–12 to 57,900 in 2015–16 (or from 170 to 237 per 100,000 population) (Supplementary Table 4.7.2). The rise in drug-related (excluding alcohol) hospitalisations has been largely driven by increases associated with amphetamines and cannabinoids. This is particularly the case for amphetamine-related separations, which increased from 24 separations per 100,000 population in 2011–12 to 63 separations per 100,000 in 2015–16 (Figure 4.7.1).

**Figure 4.7.1: Hospital separations with a drug-related principal diagnosis (selected drugs), 2011–12 to 2015–16**

**Hospital separations  
(number per 100,000 population)**



*Note:* All rates are based on the latest version of the Australian estimated resident population as at 31 December of the reference year.

*Source:* National Hospital Morbidity Database; Table S4.7.1.

## Treatment

The Alcohol and Other Drug Treatment Services National Minimum Data Set reported a total of 128,000 treatment episodes in 2016–17 (66%) where the principal drug of concern was an illicit drug excluding alcohol (this includes prescription drugs and volatile solvents) (see Chapter 7.19 ‘Specialised alcohol and other drug treatment services’).

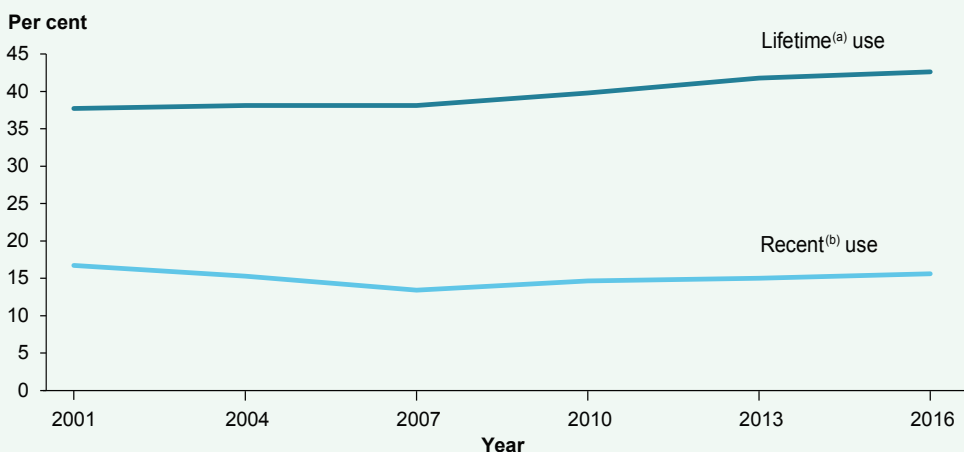
Similar to drug-related hospitalisations (which had an increase in cannabinoids and amphetamine-related separations), treatment episodes for amphetamines and cannabis also increased over this period. Between 2011–12 and 2016–17, treatment for amphetamines almost tripled, from 16,900 to 49,700 episodes, and treatment for cannabis rose from 32,300 to 41,900 treatment episodes (AIHW 2018a).

## Current use and trends in illicit drugs

According to the NDSHS 2016, 8.5 million (or 43%) people aged 14 and over in Australia had illicitly used a drug at some point in their lifetime (Figure 4.7.2). This includes cannabis, ecstasy, meth/amphetamine, cocaine, hallucinogens, inhalants, heroin, ketamine, gammahydroxybutyrate (commonly known as GHB), synthetic cannabinoids, new and emerging psychoactive substances, and the misuse of pharmaceuticals (namely, painkillers/analgesics and opioids, tranquilisers/sleeping pills, steroids and methadone or buprenorphine).

Around 3.1 million (or 16%) people had illicitly used a drug in the last 12 months. This includes the non-medical use of pharmaceuticals. While the proportion of Australians using illicit drugs is higher than in 2007, there has been no clear trend since 2001. The number of people illicitly using drugs increased from about 2.6 million in 2001 to 3.1 million in 2016 (Supplementary Table S4.7.3).

**Figure 4.7.2: Recent and lifetime use of any illicit drug, people aged 14 and over, 2001 to 2016**



(a) Used at least 1 of 16 illicit drugs in 2016 in their lifetime—the number and type of drug used varied between 2001 and 2016.

(b) Used at least 1 of 16 illicit drugs in 2016 in the previous 12 months—the number and type of drug used varied between 2001 and 2016.

Source: National Drug Strategy Household Survey; Table S4.7.3.

Among the 16% of people aged 14 and over in Australia who used illicit drugs recently in 2016, 4 in 5 reported using illegal drugs such as cannabis and cocaine, or other substances such as inhalants. The remaining 1 in 5 reported misuse of a pharmaceutical drug (without use of any illicit drug).

Overall, an estimated 1 million people (or 4.8%) aged 14 and over had used a pharmaceutical drug for non-medical purposes in the past 12 months. The pharmaceuticals most commonly used in Australia for non-medical purposes were pain-killers/opioids (3.6%) and tranquillisers/sleeping pills (1.6%) (Supplementary Table S4.7.4). The majority of people who used a pain-killer/opioid for non-medical purposes reported misusing an over-the-counter codeine product (75%), followed by prescription codeine products (40%) (AIHW 2017).

Over one-quarter (28%) of people who misuse pharmaceuticals did so daily or weekly, making pharmaceutical misuse one of the most commonly used drugs; it was second only to cannabis (36% of users did so daily or weekly), and use was more frequent than for meth/amphetamines (20%).

The 4 most commonly used illegal drugs in the previous 12 months among people aged 14 and over were cannabis (10%), cocaine (2.5%), ecstasy (2.2%) and meth/amphetamine (1.4%).

## Cannabis

Cannabis is the most commonly used illicit drug in Australia—35% of people have used it in their lifetime and 1 in 10 (10%) reported using it in the last 12 months. Lifetime and recent use of cannabis have remained relatively unchanged since 2004 (Supplementary Table S4.7.4). Cannabis is used frequently among recent users, with more than 1 in 3 (36%) using it as often as daily or weekly (Table 4.7.1). Cannabis users were older in 2016—both the age of first use and the average age of recent users have increased since 2013 (Supplementary Table S4.7.5).

### Box 4.7.2: Medicinal cannabis in Australia

In 2016, the Federal Parliament of Australia passed the *Narcotic Drugs Amendment Act 2016* to allow the controlled cultivation of cannabis in Australia for medicinal and related scientific purposes, via a national licensing scheme (Hughes 2016). Both Australian and state and territory governments have implemented legislative and policy change to allow the cultivation, manufacture, prescribing and dispensing of medicinal cannabis products for patients in Australia (Department of Health Therapeutic Goods Administration 2017).

At the time of collecting the 2016 NDSHS data, however, no state or territory had legalised cannabis for medicinal use. Recreational use of cannabis remains illegal across all federal, state and territory laws in Australia.

**Table 4.7.1: Snapshot of drug use for the top 4 most commonly used illegal drugs, 2016**

	<b>Cannabis</b>	<b>Cocaine</b>	<b>Ecstasy</b>	<b>Meth/ amphetamines</b>
<b>Among people aged 14 and over:</b>				
Lifetime use	34.8% (6.9 million)	9.0% (1.8 million)	11.2% (2.2 million)	6.3% (1.3 million)
Recent use (last 12 months)	10.4% (2.4 million)	2.5% (500,000)	2.2% (400,000)	1.4% (280,000)
Change in recent use since 2013	Stable (10.2%)	Stable (2.1%)	Stable (2.5%)	↓ 2.1%
Long-term trend in recent use since 2001	↓ (12.9% in 2001)	↑ (1.3% in 2001)	↓ (2.9% in 2001)	↓ (3.4% in 2001)
Average age of first use (14 years and over)	19	24	22	22
Average age of first use (14–29 years)	17	21	19	19
<b>Among recent users:</b>				
Age group most likely to use	20–29 (22.1%)	20–29 (6.9%)	20–29 (7.0%)	20–29 (2.8%)
Used weekly or more often	36.4%	3.2%	1.9%	20.4%
Main form used	Flowers/Head (68.2%)	Powder (97.8%)	Pills (51.2%)	Crystal/ ice (57.3%)
Average age of user	34	31	28	34
Diagnosed or treated for a mental illness	28.2%	24.6%	26.5%	42.3%
High or very high psychological distress levels	23.8%	21.9%	26.6%	37.2%

↑ Statistically significant increase.

↓ Statistically significant decrease.

Source: National Drug Strategy Household Survey.

## Cocaine

In 2016, cocaine was the second most commonly used illicit drug in the previous 12 months, with 2.5% of the population aged 14 and over reporting its use. The proportion of people using cocaine rose from 1.0% in 2004, and cocaine use in Australia is currently at the highest levels seen since 2001 (Supplementary Table S4.7.4). The proportion of people using cocaine in their lifetime has also increased, from 8.1% in 2013 to 9.0% in 2016, and has doubled since 2001 (from 4.4%).

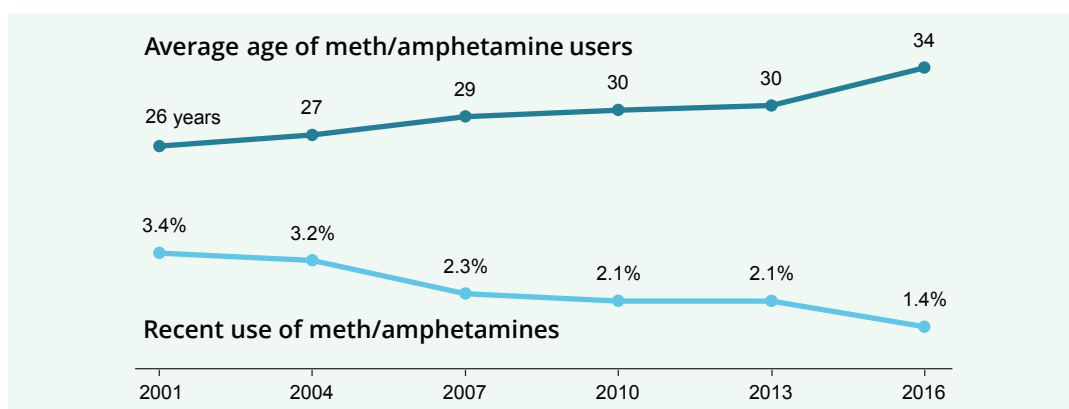
Most people who use cocaine do so relatively infrequently, with about 2 in 3 (64%) using it only once or twice a year (Supplementary Table S4.7.6). Among people aged 14–29 in 2016, the average age of first use was 21; this has been consistent over the last decade. This is older than the average age of first use for other illicit drugs, such as cannabis (17) and ecstasy (19). Across all age groups, the average age of recent users increased by about 2 years between 2004 and 2016 (from age 29 to 31) (Supplementary Table S4.7.5).

## Ecstasy

The recent use of ecstasy among people aged 14 and over peaked in 2007, at 3.5%, and has since declined—to 2.2% in 2016. The average age of first use for people aged 14–29 has remained stable, at about age 19 since 2007 (though slightly older in 2001 and 2004). The average age of recent ecstasy users was 28, which is younger than users of cannabis, cocaine and meth/amphetamines (Table 4.7.1). The majority of recent ecstasy users used it once or twice a year (51%) (Supplementary Table S4.7.6).

## Meth/amphetamines

Meth/amphetamine use has been declining since 2001, when 3.4% of people aged 14 and over had used it recently. Recent use declined significantly between 2013 and 2016 (from 2.1% to 1.4%). This decline was mainly driven by a substantial decrease among people in their 20s; among whom recent use of meth/amphetamines halved between 2013 and 2016 (from 5.7% to 2.8%) and has declined by 75% since 2001 (from 11% to 2.8%) (Supplementary Table S4.7.7). The average age of recent users rose between 2013 and 2016 from 30 to 34 (Supplementary Table S4.7.5).



In 2013, the main form of meth/amphetamines used changed: ice replaced powder as the preferred form. This trend continued in 2016, with 57% of meth/amphetamine users reporting that crystal/ice was the main form of meth/amphetamines used in the previous 12 months (a significant increase from 22% in 2010). Over the same period, the use of powder decreased, from 51% in 2010 to 20% in 2016. While overall recent meth/amphetamine use declined between 2013 and 2016, the proportion using crystal/ice remained relatively stable between 2013 and 2016 (1.0% and 0.8%, respectively) and has increased since 2010 (0.4%). Use of forms other than crystal/ice has fallen since 2007 and significantly declined between 2013 and 2016 (from 1.0% to 0.6%) (AIHW 2017).

## Frequency of drug use

Some drugs are used much more often than others. Very few cocaine and ecstasy users used the drug as often as weekly (only about 2–3%) but 1 in 5 meth/amphetamine users used the drug weekly or more often (AIHW 2017). Therefore, when examining the share of people in Australia using an illegal drug weekly or more often in 2016, meth/amphetamines was the second most commonly used illegal drug after cannabis (Supplementary Table S4.7.6). This is clear when comparing survey data with data from the Australian Criminal Intelligence Commission’s National Wastewater Drug Monitoring Program (NWDMP) (Box 4.7.3). The NWDMP found that meth/amphetamine was the most highly consumed illicit drug tested across all regions of Australia (ACIC 2017), noting that the program does not test for cannabis or heroin.

### **Box 4.7.3: National Wastewater Drug Monitoring Program**

The NWDMP analyses wastewater samples from 54 treatment plants across Australia (excluding the Northern Territory and Tasmania). The third report in the series was based on data from sewage analysis of 14.2 million people, or 61% of the population.

The wastewater was tested for 13 illicit and licit (legal) substances, including cocaine, ecstasy (3, 4-methylenedioxymethamphetamine, abbreviated to MDMA), alcohol, tobacco and several prescription medications. Estimates are produced on the amount of each drug consumed by the community over a specified period (ACIC 2017).

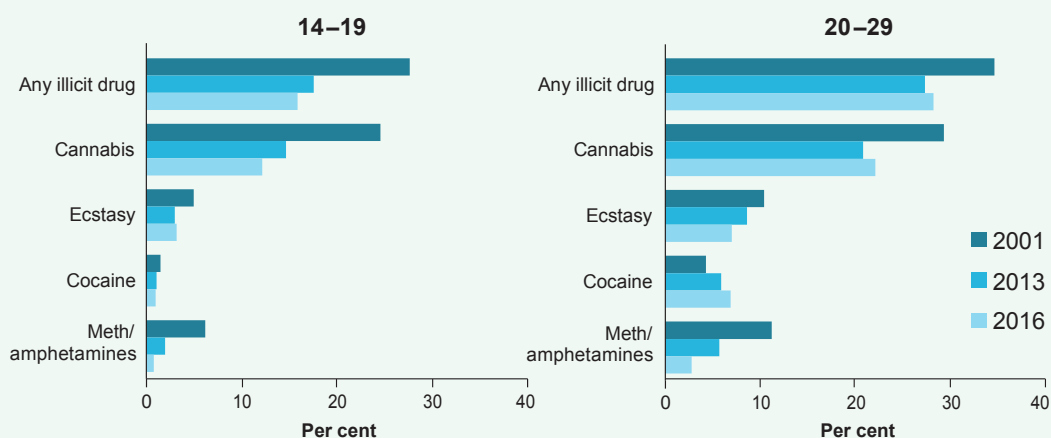
## Age and sex comparisons for the top 4 most commonly used illegal drugs

### People aged 14–29

Young people aged 14–19 were far less likely to use illicit drugs in 2016 than in 2001. Use of cannabis halved over this period while use of ecstasy and cocaine declined by one-third, and use of meth/amphetamines dropped considerably, from 6.2% to 0.8% (Figure 4.7.3). The Australian Secondary Students’ Alcohol and Drug Survey identified similar trends. Among secondary students aged 12–17, the use of an illicit drug declined from 20% in 2005 to 15% in 2014 (White & Williams 2016).

A smaller proportion of people in their 20s were using illicit drugs in 2016 than in 2001. Recent use of cannabis, meth/amphetamines and ecstasy were lower in 2016 than in 2001. However, people in their 20s continue to be more likely to use cannabis, ecstasy or cocaine in the previous 12 months than any other age group (Figure 4.7.3).

**Figure 4.7.3: Proportion of people aged 14–29 who used illicit drugs in the previous 12 months, by age group, 2001, 2013 and 2016**

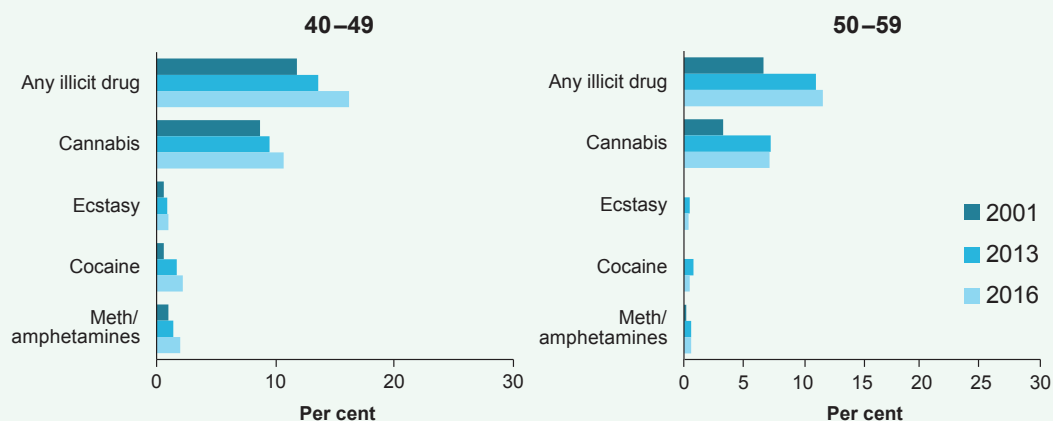


Source: National Drug Strategy Household Survey; Table S4.7.7.

## People aged 40 and over

In 2001, about 12% of people in their 40s had used an illicit drug in the previous 12 months. This had increased to 14% by 2013, and to 16% in 2016. People in their 40s were the only age group to show a significant increase in use between 2013 and 2016. People in their 50s generally have some of the lowest rates of illicit drug use, but have also shown increases in recent use since 2001, from 6.7% to 12% in 2016. The rise in the use of any illicit drug was largely driven by an increase in both the recent use of cannabis and the non-medical use of pharmaceuticals (for both age groups) (Figure 4.7.4).

**Figure 4.7.4: Proportion of people aged 40–59 who used illicit drugs in the previous 12 months, by age group, 2001, 2013 and 2016**



Note: The 2001 ecstasy and cocaine estimates for people aged 50–59 are less than 0.1 and have a very high relative standard error.

Source: National Drug Strategy Household Survey; Table S4.7.7.



People who were using illicit drugs in their late 20s in 2001 would be in their early 40s in 2016. In 2001, people in their 20s had a high prevalence of illicit drug use compared with people in their 20s in 2016. The increase in illicit drug use seen among people in their 40s may be due to their continued use of illicit drugs as they age.

## Illicit drug use among specific population groups

Illicit drug use varies across different population groups in Australia. Table 4.7.2 focuses on those groups that have some of the largest disparities in illicit drug use compared with the general population—people living in more remote areas, people who were unemployed, people identifying as homosexual or bisexual, and people with a mental illness or high levels of psychological distress.

**Table 4.7.2: Proportion of people aged 14 and over who used illicit drugs in the previous 12 months (per cent), by selected population groups, 2016**

	<b>Any illicit drug</b>	<b>Cannabis</b>	<b>Ecstasy</b>	<b>Cocaine</b>	<b>Meth/ amphetamines</b>
Remote/ Very remote	24.8	17.0	1.9	*0.7	*3.5
Unemployed people	23.6	18.7	2.9	*2.4	4.6
Homosexual/ bisexual people <sup>(a)</sup>	41.7	31.4	11.0	8.9	6.9
People with a mental illness	26.6	19.4	3.9	4.1	4.1
People with high/ very high levels of psychological distress <sup>(b)</sup>	30.2	21.8	5.2	5.1	4.7
<b>Total (aged 14 and over)</b>	<b>15.6</b>	<b>10.4</b>	<b>2.2</b>	<b>2.5</b>	<b>1.4</b>

\* Estimate has a relative standard error between 25% and 50% and should be interpreted with caution.

(a) Findings for people who identify as gay, lesbian or bisexual (reported as homosexual/bisexual in the National Drug Strategy Household Survey) were grouped together for data quality purposes but it is important to note that there are differences in substance use between these groups.

(b) Aged 18 and over.

## Illicit drug use and mental health

There is a strong association between illicit drug use and mental illness. However, it is often difficult to determine to what extent drug use causes mental health problems, and to what degree mental health problems give rise to drug use (Loxley et al. 2004). A mental illness may make a person more likely to use drugs—for example, for short-term relief from their symptoms—while other people may have drug problems that trigger the first symptoms of mental illness. Some drugs cause drug-induced psychosis, which usually passes after a few days. However, if someone has a predisposition to a psychotic illness such as schizophrenia, the use of illicit drugs may trigger the first episode in what can be

a lifelong mental illness (Sane Australia 2017). The use of drugs can interact with mental illness in ways that create serious adverse effects on many areas of functioning, including work, relationships, health and safety.

Comorbidity or the co-occurrence of a drug use disorder with one or more mental health issues complicates treatment and services for both conditions. Using drugs can worsen the symptoms of mental illness and may mean that treatment is less effective (Department of Health 2017). Data from multiple sources indicate the prevalence of comorbidity in Australia:

- 26% of recent illicit drug users had been diagnosed or treated for a mental illness in the previous 12 months (AIHW 2017)
- 22% of recent illicit drug users reported high or very high levels of psychological distress in the previous 4 weeks (AIHW 2017)
- 26% of prison entrants reported illicit drug use in the previous 12 months and had 'ever been told' they had a mental health condition, including drug and alcohol abuse (AIHW 2015)
- 15% of prison entrants reported illicit drug use in the previous 12 months and were currently on medication(s) for a mental health condition (AIHW 2015)
- 29% of young people (aged 13–17) with a major depressive disorder had used cannabis in their lifetime (Lawrence et al. 2015)
- 66% of people with a psychotic illness had used cannabis in their lifetime and 33% had used it in the past year (Department of Health and Ageing 2011)
- 8.7% of people with a mental disorder in the previous 12 months had a comorbid diagnosis of substance use and at least one other mental disorder (either anxiety disorder, affective disorder or both) (ABS 2007).

## Mental illness among people who use illicit drugs

According to the 2016 NDSHS estimates, 16% of the general population aged 14 and over had been diagnosed or treated for a mental illness in the previous 12 months, a significant increase from 14% in 2013. The proportion of adults experiencing high or very high levels of psychological distress also increased, from 10% in 2013 to 12% in 2016 (AIHW 2017).

Increasing literacy and awareness about mental illness in Australia may partially explain these reported increases among the general population (National Mental Health Commission of NSW 2015); however, there are likely to be other factors involved, including changing trends and patterns in the use of alcohol and other drugs. In fact, the 2016 NDSHS showed that self-reported rates of mental illness were higher among people who reported the use of illicit drugs in the previous 12 months than among people who had not used over this period. Specifically, mental illness was reported by:

- 26% of people who had used any illicit drug in the previous 12 months, compared with 14% of people who had not used an illicit drug in the previous 12 months
- 28% of recent cannabis users
- 26% of recent ecstasy users
- 42% of recent meth/amphetamine users
- 25% of recent cocaine users (Supplementary Table S4.7.8).

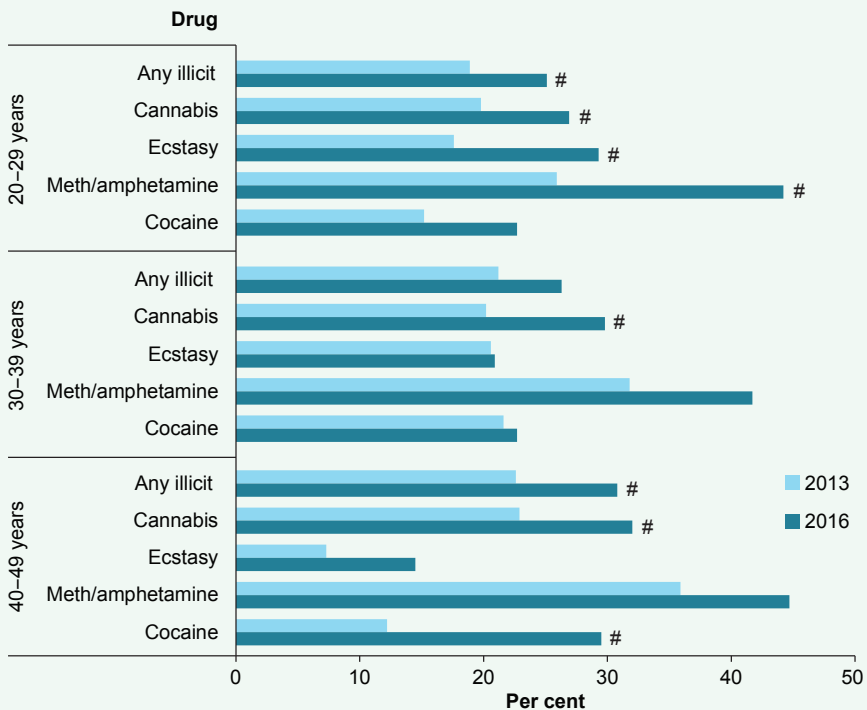
Between 2013 and 2016, the proportion of people who self-identified as being diagnosed with, or treated for, a mental illness significantly increased among recent users of cannabis, ecstasy, meth/amphetamines and cocaine (Supplementary Table S4.7.8). The most noticeable increase was among recent users of ecstasy (from 18% to 26%), followed by recent users of meth/amphetamines (from 29% to 42%).

Figure 4.7.5 shows that these increases were consistent for people in their 20s, 30s and 40s but only statistically significant for some age groups. More specifically:

- ecstasy and meth/amphetamine users in their 20s reported the largest increases in diagnosis or treatment for mental illness between 2013 and 2016 (from 18% to 29% for ecstasy users and from 26% to 44% for meth/amphetamine users)
- cannabis users in their 20s, 30s and 40s all reported significant increases in mental illness over the 3-year period
- illicit drug users in their 40s were most likely to report a mental illness (31%) and, in this age group, the proportion of cocaine users with a mental illness more than doubled between 2013 and 2016 (from 12% to 30%)
- among people in their 30s who used illicit drugs, the increase in mental illness was only significant for cannabis users (from 20% to 30%).

The Ecstasy and Related Drugs Reporting System, which surveys regular psychostimulant users, also reported a significant increase in self-reported mental health problems between 2013 and 2017 (from 30% to 46%) (Sutherland et al. 2017).

**Figure 4.7.5: Proportion of illicit drug users with a mental illness, by age group, 2013 and 2016**



# = statistically significant increase between 2013 and 2016.

Source: National Drug Strategy Household Survey; Table S4.7.9.

## Psychological distress among people who use illicit drugs

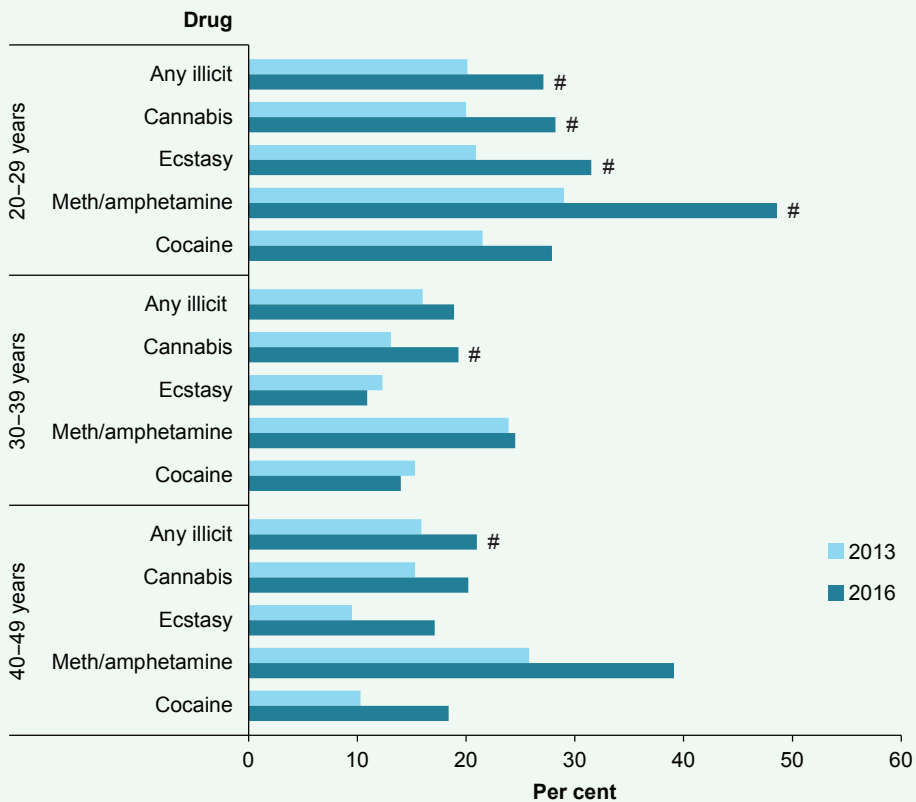
Psychological distress is higher among people who use illicit drugs than among people who do not. Specifically, high or very high levels of psychological stress were reported by:

- 22% of people who reported using illicit drugs in the previous 12 months, compared with 9.7% of people who did not report illicit drug use
- 24% of recent cannabis users
- 27% of recent ecstasy users
- 37% of recent meth/amphetamine users
- 22% of recent cocaine users (Supplementary Table S4.7.10).

The proportion of recent users of illicit drugs with high or very high levels of psychological distress increased between 2013 and 2016. The increase in high or very high levels of psychological distress was most noticeable among people who had used ecstasy in the last 12 months—it increased from 18% in 2013 to 27% in 2016 (Supplementary Table S4.7.10). High or very high distress levels also significantly increased among people who had used meth/amphetamines in the previous 12 months. This increase was mainly driven by the increase in psychological distress levels in users in their 20s and 40s (Figure 4.7.6).

People in their 20s who used illicit drugs reported the largest increase in psychological distress between 2013 and 2016. The increases in high or very high psychological distress levels between 2013 and 2016 were consistent across recent users of cannabis (from 20% to 28%), ecstasy (from 21% to 32%) and meth/amphetamines (from 29% to 49%). People in their 30s who used illicit drugs were less likely to experience psychological distress than users in their 20s and 40s and the increase between 2013 and 2016 was not significant.

**Figure 4.7.6: Illicit drug users with high or very high levels of psychological distress, by age group, 2013 and 2016**



# = statistically significant increase between 2013 and 2016.

Source: National Drug Strategy Household Survey; Table S4.7.11.

## Variations among population groups

Sociodemographic characteristics such as sexual orientation, socioeconomic area, remoteness area, employment status, education and household type may be associated with illicit drug use and mental health (Table 4.7.3).

Use of an illicit drug in the previous 12 months, and being diagnosed or treated for a mental health condition, was particularly high among:

- single people with dependent children (43%)
- people who were unemployed (40%)
- people identifying as homosexual or bisexual (37%)
- people living in the lowest socioeconomic area (35%)
- people living in *Inner regional* areas (32%)
- people who had completed a certificate or diploma (31%).

**Table 4.7.3: Proportion of Illicit drug users aged 18 and over diagnosed or treated for a mental illness in the previous 12 months, by sociodemographic characteristics, 2013 and 2016**

<b>Sociodemographic characteristic</b>	<b>2013</b>	<b>2016</b>
<b>Remoteness area</b>		
Major cities	19.6	24.6 #
Inner regional	25.1	32.2 #
Outer regional	22.0	30.9 #
Remote/Very remote	21.1	26.3
<b>Socioeconomic area</b>		
1 (Lowest)	25.9	35.0 #
2	22.9	27.9
3	21.8	26.8
4	19.2	24.0
5 (Highest)	15.0	18.0
<b>Education</b>		
Post-school education	19.0	26.5 #
Certificate or diploma	20.5	30.7 #
Bachelor degree or higher	15.6	23.2 #
No post-school education	23.6	26.8
<b>Employment status</b>		
Employed	15.3	20.9 #
Student	16.4	25.7
Unemployed	36.9	40.1
Home duties	23.6	36.8
Unable to work	57.4	62.0
<b>Sexual orientation</b>		
Homosexual/bisexual	32.8	36.8
Heterosexual	19.3	25.2 #
<b>Household</b>		
Single with dependant children	34.7	42.9
Couple with dependant children	13.5	21.9 #
Parents with non-dependant children	24.8	21.1
Single no children	27.6	31.3
Couple no children	16.1	21.3 #
<b>Total population</b>	<b>20.7</b>	<b>26.5 #</b>

# = statistically significant increase between 2013 and 2016.

## What is missing from the picture?

The Alcohol and Other Drug Treatment Services National Minimum Data Set does not capture the mental health status of a person seeking treatment.

Identifying mental health issues in people who access treatment will have greater relevance to policy makers, program designers and service planners.

Data linkage between people accessing AOD treatment services and mental health-related services would provide a better understanding of the overlap and interaction between these services.

## Where do I go for more information?

More information on illicit drug use is available at <[www.aihw.gov.au/reports-statistics/behaviours-risk-factors/illicit-use-of-drugs/overview](http://www.aihw.gov.au/reports-statistics/behaviours-risk-factors/illicit-use-of-drugs/overview)> and <[www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/burden-of-disease/overview](http://www.aihw.gov.au/reports-statistics/health-conditions-disability-deaths/burden-of-disease/overview)>. The report *National Drug Strategy Household Survey 2016: detailed findings* and *Impact of alcohol and illicit drug use on the burden of disease and injury in Australia: Australian Burden of Disease Study 2011* and other recent releases are available for free download.

For more information on mental health services see <[www.aihw.gov.au/reports/mental-health-services/mental-health-services-in-australia/report-contents/summary](http://www.aihw.gov.au/reports/mental-health-services/mental-health-services-in-australia/report-contents/summary)>.

Additional research and statistics on illicit drug use are available from the websites of the [National Drug and Alcohol Research Centre](#), [National Drug Research Institute](#), and the [National Centre for Education and Training on Addiction](#).

## References

- ABS (Australian Bureau of Statistics) 2007. National survey on mental health and wellbeing: summary of results, 2007. ABS cat. no. 4326.0. Canberra: ABS.
- ABS 2017. Causes of death, Australia, 2016. ABS cat. no. 3303.0. Canberra: ABS.
- ACIC (Australian Criminal Intelligence Commission) 2017. National wastewater drug monitoring program, report 3. Canberra: ACIC.
- AIHW (Australian Institute of Health and Welfare) 2015. The health of Australia's prisoners 2015. Cat. no. PHE 207. Canberra: AIHW.
- AIHW 2016. Australian Burden of Disease Study: impact and causes of illness and death in Australia 2011. Australian Burden of Disease Study series no. 3. BOD 4. Canberra: AIHW.
- AIHW 2017. National Drug Strategy Household Survey 2016: detailed findings. Drug statistics series no. 31. Cat. no. PHE 214. Canberra: AIHW.
- AIHW 2018a. Alcohol and other drug treatment services in Australia 2016–17: key findings. Canberra: AIHW. Viewed 20 April 2018, <<https://www.aihw.gov.au/reports/alcohol-other-drug-treatment-services/aodts-2016-17-key-findings/contents/summary>>.
- AIHW 2018b. Impact of alcohol and illicit drug use on the burden of disease and injury in Australia: Australian Burden of Disease Study 2011. Australian Burden of Disease Study series no. 17. Cat. no. BOD 19. Canberra: AIHW.
- Department of Health and Ageing 2011. People living with psychotic illness 2010: Report on the second Australian national survey. Canberra: Department of Health and Ageing.
- Department of Health 2017. The National Drug Strategy 2017–2026. Canberra: Department of Health. Viewed 22 February, <<https://campaigns.health.gov.au/drughelp/resources/publications/report/national-drug-strategy-2017-2026>>.

Department of Health: Therapeutic Goods Administration 2017. Guidance for the use of medicinal cannabis in Australia: overview. Canberra: Department of Health. Viewed 26 February 2018, <<https://www.tga.gov.au/publication/guidance-use-medicinal-cannabis-australia-overview>>.

Hughes C 2016. The Australian (illicit) drug policy timeline: 1985–2016, Drug Policy Modelling Program. Sydney: University of New South Wales. Viewed 26 February 2018, <<http://dpmp.unsw.edu.au/resource/drug-policy-timeline>>.

Lawrence D, Johnson S, Hafekost J, Boterhoven de Haan K, Sawyer M, Ainley J et al. 2015. The mental health of children and adolescents. Report on the second Australian Child and Adolescent Survey of Mental Health and Wellbeing. Canberra: Department of Health. Viewed 21 January, <<http://www.health.gov.au/internet/main/publishing.nsf/Content/mental-pubs-m-child2>>.

Loxley W, Toumbourou J, Stockwell TR, Haines B, Scott K, Godfrey C et al. 2004. The prevention of substance use, risk and harm in Australia: a review of the evidence. Canberra: The National Drug Research Institute and the Centre for Adolescent Health. NHMRC

MCDS (Ministerial Council on Drug Strategy) 2011. The National Drug Strategy 2010–2015. Canberra: Commonwealth of Australia.

National Mental Health Commission of NSW 2015. National surveys of mental health literacy and stigma and national survey of discrimination and positive treatment: a report for the Mental Health Commission of NSW. Sydney: Mental Health Commission of NSW.

NHMRC (National Health and Medical Research Council) 2017. NHMRC centre of research excellence in mental health and substance use. Viewed 20 November 2017, <<https://comorbidity.edu.au/content/about-us>>.

Sane Australia 2017. Drugs & mental illness. Melbourne: Sane Australia. Viewed 13 November, <<https://www.sane.org/mental-health-and-illness/facts-and-guides/drugs-and-mental-illness>>.

Sutherland R, Roxburgh A, Uporova J & Ritter A 2017. Australian drug trends 2017: preliminary findings from the Ecstasy and related Drugs Reporting System. Sydney: National Drug and Alcohol Research Centre, University of New South Wales.

White V & Williams T 2016. Australian secondary school students' use of tobacco, alcohol, and over-the-counter and illicit substances in 2014. Melbourne: Centre for Behavioural Research in Cancer, Cancer Council Victoria.



## 4.8 Insufficient physical activity

Regular physical activity is important for optimal health and wellbeing. It reduces the risk of many chronic conditions (such as cardiovascular disease and type 2 diabetes) and other disease risk factors such as overweight and obesity and high blood pressure. Strength and resistance training is also important to achieve and keep good health as it improves muscle strength and bone density, protecting against injury and osteoporosis.

Insufficient physical activity is a key risk factor contributing to disease burden in Australia. Given the role it plays in chronic conditions, it is important for Australians to achieve the optimal levels of physical activity recommended in Australia's Physical Activity and Sedentary Behaviour Guidelines (Department of Health 2017). See Chapter 4.4 'Contribution of selected risk factors to the burden of disease' for more information on the health impact of insufficient physical activity.

### Physical activity by age group

Based on self-reported data from the Australian Bureau of Statistics National Health Survey, in 2014–15, 56% of adults aged 18 and over were not sufficiently active (ABS 2015).

After adjusting for age, the proportion of adults aged 18 and over who reported completing less than the recommended amount of physical activity decreased over time, from 49% in 2007–08 to 44% in 2014–15 (ABS 2017).

#### Children and young people (aged 2–17)

In 2011–12, an estimated 39% of children aged 2–5 did less than the recommended 180 minutes of physical activity each day; 74% of children aged 5–12 and 92% of young people aged 13–17 did not complete 60 minutes of moderate to vigorous intensity physical activity every day (ABS 2013).

#### Adults (aged 18–64)

In 2014–15, an estimated 52% of adults aged 18–64 did less than the recommended 150 minutes of moderate intensity physical activity, or 75 minutes of vigorous intensity physical activity, across 5 or more sessions each week. An estimated 70% of adults did no strength-based activities. Only 19% of adults aged 18–64 did the recommended amount of physical activity and strength-based training (ABS 2016).

#### Older people (aged 65 and over)

In 2014–15, for older Australians (aged 65 and over), an estimated 75% did not do 30 minutes of moderate or vigorous intensity physical activity on at least 5 days each week. Among people aged 65–74, 72% of women were insufficiently active; this increased to 92% for people aged 85 and over. For men aged 65–74, 73% were insufficiently active, and this was similar for people aged 85 and over (74%) (ABS 2015).

#### Physical activity guidelines:



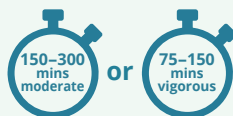
each day

2–5 years



each day

5–12 and 13–17 years



over 5 sessions per week

18–64 years



on at least 5 days per week

65 years and older

## Types of physical activity

Physical activity can be sport and leisure activities, household chores, working or active travel. Some common forms of physical activity include swimming, tennis, golf, gym activities and bushwalking. The three most popular organised sport and physical activities by age group according to the Australian Sports Commission's AusPlay survey for 2016–17 (ASC 2017) are presented here.

### Three most popular organised sport and leisure physical activities:



#### Children aged 5–11<sup>(a)</sup>

1. Swimming (39%)
2. Football/soccer (19%)
3. Australian football (12%)



#### Young people aged 12–17<sup>(a)(b)</sup>

1. Football/soccer (22%)
2. Basketball (15%)
3. Netball (15%)



#### Adults aged 18–64

1. Recreational walking (41%)
2. Fitness/gym activities (36%)
3. Athletics (including jogging) (18%)



#### Older Australians aged 65+

1. Recreational walking (62%)
2. Fitness/gym activities (26%)
3. Swimming (12%)

(a) Data on participation for children aged 0 to 14 are reported by parents and relate to organised out-of-school sports and activities.

(b) Data on participation for children aged 15 to 17 are self-reported and relate to both organised and non-organised sports.

According to self-reported data from the National Health Survey, in 2014–15, walking was the only form of physical activity for 40% of adults aged 18–64:

- 16% walked for transport as their only type of physical activity
- 11% walked for exercise only
- 13% walked for both exercise and transport as their only type of physical activity.

## Physical activity across population groups

Physical activity rates varied across population groups. Based on self-reported data from the National Health Survey, in 2014–15, 60% of adults aged 18–64 living in *Outer regional* and *Remote* areas of Australia were insufficiently active compared with 50% in *Major cities*. Physical activity rates for adults aged 18–64 also varied with socioeconomic area; 63% of adults in the lowest socioeconomic area were insufficiently active, compared with 40% in the highest socioeconomic area (ABS 2016).

In 2012–13, more Aboriginal and Torres Strait Islander people aged 18 and over living in non-remote areas were insufficiently active compared with non-Indigenous Australians of the same age living in the same areas (64% compared with 56%) (ABS 2014).

## What is missing from the picture?

There is a lack of data to monitor long-term trends in physical activity levels among different groups, especially young children. Surveys that collect comprehensive physical activity data, such as the total amount of time and frequency of physical activity completed, are administered infrequently. The 2011–12 National Nutrition and Physical Activity Survey (a component of the 2011–13 Australian Health Survey) is the most recent survey with data of this comprehensive nature and is only a single time point.

Current data collected in physical activity surveys do not capture occupational physical activity (that is, physical activity done as part one's job) or activity due to household chores, which could contribute to a large part of adult physical activity. Furthermore, the data are self-reported and are therefore prone to misreporting. When measured data are captured (for example, pedometer steps), there are no standardised methods.

Using discrete categories for reporting on physical activity, such as against the Australian Physical Activity and Sedentary Behaviour Guidelines, is also a limitation because it does not take into account the relationship between extra health benefits gained and increases, however small, in activity levels.

## Where do I go for more information?

More information on physical activity is available on these AIHW websites:

- <[www.aihw.gov.au/reports/biomedical-risk-factors/risk-factors-to-health/contents/insufficient-physical-activity](http://www.aihw.gov.au/reports/biomedical-risk-factors/risk-factors-to-health/contents/insufficient-physical-activity)>
- <[www.myhealthycommunities.gov.au/national/abs0055](http://www.myhealthycommunities.gov.au/national/abs0055)>.

The report *Impact of physical inactivity as a risk factor for chronic conditions: Australian Burden of Disease* is available for free download.

## References

- ABS (Australian Bureau of Statistics) 2013. Microdata: Australian Health Survey, 2011–12. ABS cat. no. 4324.0.55.001. Canberra: ABS. AIHW analysis of Expanded Confidentialised Unit Record File.
- ABS 2014. Australian Aboriginal and Torres Strait Islander Health Survey: Physical Activity, 2012–13, Australia. ABS cat. no. 4727.0.55.004. Canberra: ABS.
- ABS 2015. National Health Survey: First Results, 2014–15, Australia. ABS cat. no. 4364.0.55.001. Canberra: ABS.
- ABS 2016. Microdata: National Health Survey, 2014–15. ABS cat. no. 4324.0.55.001. Canberra: ABS. AIHW analysis of Basic Confidentialised Unit Record File.
- ABS 2017. National Health Survey, 2014–15. Customised report. Canberra: ABS.
- ASC (Australian Sports Commission) 2017. AusPlay survey results July 2016–June 2017. Canberra: ASC.
- Department of Health 2017. Australia's Physical Activity and Sedentary Behaviour Guidelines. Canberra: Department of Health. Viewed 29 January 2018, <<http://www.health.gov.au/internet/main/publishing.nsf/content/health-pubhlth-strateg-phys-act-guidelines>>.

## 4.9 Diet

The food and beverages we consume (our diet) play an important role in our overall health and wellbeing. Food provides energy, nutrients and other components that, if consumed in insufficient or excess amounts, can result in ill health. A healthy diet helps to prevent and manage health risk factors such as overweight and obesity, high blood pressure and high cholesterol, as well as associated chronic conditions, including type 2 diabetes, cardiovascular disease and some forms of cancer. Diet-related chronic conditions are among the leading causes of death and disability in Australia.

### The five food groups

The Australian Dietary Guidelines provide advice on healthy eating habits to promote overall health and wellbeing, reduce the risk of diet-related disease and protect against chronic conditions. They recommend that Australians eat a wide variety of nutritious foods from the five food groups every day (NHMRC 2013). Food intake data from 2011–12 (the most comprehensive robust national dietary data available) show that most Australians did not consume the recommended number of serves from the five food groups (Table 4.9.1). Intake was particularly low for vegetables and legumes/beans (for children and adults); lean meats and alternatives (for children); and milk, yoghurt, cheese and alternatives (for women).

**Table 4.9.1: Proportion of the population with usual food intakes below the recommended serves (per cent), by age group, sex and food group, 2011–12<sup>(a)</sup>**

Food group	Boys	Girls	Men	Women
Vegetables and legumes/beans	99.6	99.7	96.5	94.8
Fruit <sup>(b)</sup>	53.5	54.0	70.7	77.0
Grain (cereal) foods	60.5	73.7	66.6	75.6
Lean meat and poultry, fish, eggs, nuts and seeds and legumes/beans	92.4	98.7	79.1	87.0
Milk, yoghurt, cheese and alternatives	80.4	79.8	89.9	96.5

(a) Boys and girls aged 2–18; men and women aged 19 and over.

(b) Includes dried fruit, fresh or canned fruit and fruit juice.

Source: ABS 2016b.

## Key 'risk' nutrients

The Australian Dietary Guidelines recommend limiting intake of foods containing saturated fat, added salt, added sugars and alcohol (NHMRC 2013). Food intake data from 2011–12 show that, as with the five food groups, many Australians are not following these recommendations.

- Saturated and trans fats should make up no more than 10% of total energy intake (NHMRC 2006). In 2011–12, both children and adults exceeded this recommendation (14% of total energy intake for children and 12% for adults) (ABS 2014).
- Adults should consume no more than 2,000 mg of sodium each day (NHMRC 2006). In 2011–12, average sodium intake for both men and women exceeded this recommendation (2,779 mg for men and 2,090 mg for women) (ABS 2014).
- Free sugars (sugars added to foods by manufacturers, cooks or consumers, as well as sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates) should make up less than 10% of total energy intake (WHO 2015). In 2011–12, over two-thirds (69%) of children and almost half (47%) of adults exceeded this recommendation. On average, free sugars contributed to 13% of total energy intake for boys and girls, 11% for men and 10% for women (ABS 2016a).
- To reduce the risk of alcohol-related disease and injury, healthy men and women should consume no more than two standard drinks on any one day (NHMRC 2009). In 2011–12, 10% of women and almost 3 times as many men (29%) exceeded this recommendation (ABS 2012). See Chapter 4.6 'Alcohol risk and harm' for more information.

### What is missing from the picture?

Information on food and nutrient intake is important for policy makers, educators and health professionals in their work to promote optimal health and wellbeing. Most data on national food and nutrient intake in Australia are collected from surveys that are administered infrequently and based on self-reported information, which makes them prone to underreporting.



## Where do I go for more information?

More information on nutrition is available on these AIHW websites:

- <[www.aihw.gov.au/reports/biomedical-risk-factors/risk-factors-to-health/contents/risk-factors-and-disease-burden](http://www.aihw.gov.au/reports/biomedical-risk-factors/risk-factors-to-health/contents/risk-factors-and-disease-burden)>
- <[www.aihw.gov.au/reports-statistics/behaviours-risk-factors/food-nutrition/overview](http://www.aihw.gov.au/reports-statistics/behaviours-risk-factors/food-nutrition/overview)>.

Further information about the Australian Dietary Guidelines is available at <[www.eatforhealth.gov.au](http://www.eatforhealth.gov.au)>.

Data from the Australian Bureau of Statistics 2011–13 Australian Health Survey are available at <[www.abs.gov.au/australianhealthsurvey](http://www.abs.gov.au/australianhealthsurvey)>.

## References

ABS (Australian Bureau of Statistics) 2012. Australian Health Survey: first results, 2011–12. ABS cat. no. 4364.0.55.001. Canberra: ABS.

ABS 2014. Australian Health Survey: nutrition first results—foods and nutrients, 2011–12. ABS cat. no. 4364.0.55.007. Canberra: ABS.

ABS 2016a. Australian Health Survey: consumption of added sugars, 2011–12. ABS cat. no. 4364.0.55.011. Canberra: ABS.

ABS 2016b. Australian Health Survey: consumption of food groups from the Australian Dietary Guidelines, 2011–12. ABS cat. no. 4364.0.55.012. Canberra: ABS.

NHMRC (National Health and Medical Research Council) 2006. Nutrient reference values for Australia and New Zealand including recommended dietary intakes. Canberra: NHMRC.

NHMRC 2009. Australian guidelines to reduce health risks from drinking alcohol. Canberra: NHMRC.

NHMRC 2013. Australian Dietary Guidelines. Canberra: NHMRC.

WHO (World Health Organization) 2015. Guideline: sugars intake for adults and children. Geneva: WHO.

# 4.10 Overweight and obesity

Overweight and obesity—defined as abnormal or excessive fat accumulation—is a major public health issue in Australia. Australia’s measured obesity rate now ranks fifth among Organisation for Economic Co-Operation and Development (OECD) countries (OECD 2017). Over the past two decades, the proportion of Australians with a healthy body weight has decreased, and the proportion who are obese has increased. Of concern is the growing rate of severe obesity (body mass index, or BMI, of 35 kg/m<sup>2</sup> or above), which almost doubled between 1995 and 2014–15. This growing obesity trend has costly impacts for the individual and for the Australian economy and health care system.

Overweight and obesity result from a sustained energy imbalance in the body—when energy intake from eating and drinking is greater than energy used through physical activity (AIHW 2016a). It is influenced by a complex interplay of individual, environmental and societal factors.

A diet consistent with the Australian Dietary Guidelines is recommended to maintain a healthy weight (NHMRC 2013a). This is one that is relatively high in cereals (mostly wholegrains), vegetables and legumes/beans, fruit, some lean meats and poultry, fish, eggs, tofu, nuts and seeds, and milk, yoghurt and cheese—mostly reduced-fat—and a limited intake of energy-dense, nutrient-poor foods (that is, those containing saturated fat, added salt, added sugars and alcohol) (NHMRC 2013b). See Chapter 4.9 ‘Diet’ for more information on the dietary behaviours of Australians.

Energy is spent through bodily functions and physical activity, including sport, organised recreation, and incidental activity (NHMRC 2013a). In 2014–15, over half (52%) of Australian adults aged 18–64 were insufficiently active, including 15% who were inactive (ABS 2015). See Chapter 4.8 ‘Insufficient physical activity’ for more information on Australians’ physical activity.

The way that we live has changed. Australian adults now spend more time sitting or lying down (not just when sleeping). In 2014–15, Australians spent an average of 34 hours per week sitting at leisure, up from 31 hours per week in 2011–12 (ABS 2013a, 2016b).

As the waistlines of Australians continue to expand, it is important to examine both the extent of the problem, and the influence of factors such as the environment and society in which a person lives on their dietary and physical activity behaviours.

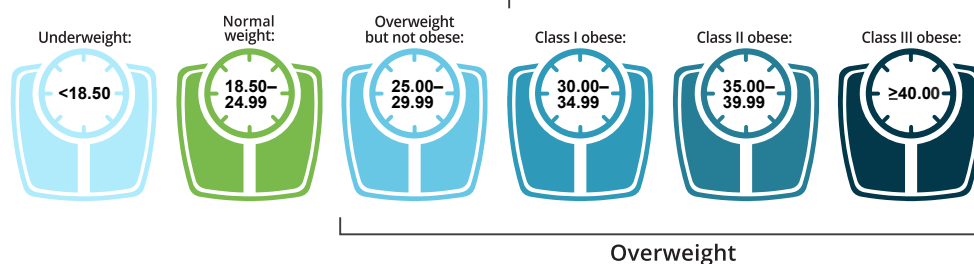
The most common and practical ways to measure overweight and obesity in population surveys are to calculate a person’s BMI or measure their waist circumference (Box 4.10.1).

## Box 4.10.1: How is overweight and obesity measured at the population level?

BMI is calculated by dividing a person’s weight (in kilograms) by their height (in metres) squared.

$$\text{BMI} = \frac{\text{weight in kg}}{(\text{height in m})^2}$$

The information in this article uses the BMI classifications for adults defined by the World Health Organization (WHO). Obesity is split into three classes, according to severity, with more severe obesity associated with a higher risk of comorbidities (WHO 2000).

BMI (kg/m<sup>2</sup>)

Waist circumference is another common measure of overweight and obesity. A waist circumference above 80 cm for women and 88 cm for men is associated with a higher risk of metabolic complications (WHO 2011). The following categories were developed by the WHO and are used in this article:

**Waist circumference**

Increased risk of metabolic complications

**Men:** 94 cm or more  
**Women:** 80 cm or more



Substantially increased risk of metabolic complications

**Men:** 102 cm or more  
**Women:** 88 cm or more

Differences in body composition may affect the appropriateness of BMI and waist circumference as population-level measures of overweight and obesity. Different BMI and waist circumference cut-off points might need to be considered for certain population groups such as older people; people with high muscle mass; and ethnic groups, including Aboriginal and Torres Strait Islander, Pacific Islander, South Asian, Chinese and Japanese populations (NHMRC 2013a).

For the information in this article, the same BMI and waist circumference measures were used for all adult population groups, based on measured—not self-reported—weight, height and waist circumference.

Measuring overweight and obesity among children and adolescents is complicated due to their growing bodies. At the population level, a series of age- and sex-specific BMI ranges developed by Cole et al. (2000) are recommended to monitor overweight and obesity in children. These ranges were used for information presented in this article and can be accessed on the Department of Health website (Department of Health 2009).



To calculate your BMI and see how you compare with the rest of Australia see the online data visualisation tool at [www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/bmi-where-do-you-fit](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/bmi-where-do-you-fit).



# Who is overweight or obese?

## Adults

Based on measured BMI, in 2014–15:

- almost two-thirds (63%) of Australians aged 18 and over were overweight or obese (36% overweight but not obese, and 28% obese) (ABS 2015)
- overall, men (71%) had higher rates of overweight and obesity than women (56%). A greater proportion of men (42%) than women (29%) were overweight but not obese, while a similar proportion of men (28%) and women (27%) were obese
- men were most likely to be overweight but not obese at age 35–44 (48%), and to be obese at age 65–74 (38%). Women were most likely to be overweight but not obese at age 75–84 (41%), and obese at age 55–64 (35%) (Figure 4.10.1).

**Figure 4.10.1: Proportion of overweight and obese adults (based on measured BMI), by age and sex, 2014–15**



Source: ABS 2015; Table S4.10.1.

Based on measured waist circumference (Box 4.10.1), in 2014–15:

- about one-quarter (24%) of men and one-fifth (21%) of women aged 18 and over had a waist circumference that indicated an increased risk of metabolic complications
- a greater proportion of women (45%) than men (35%) had a waist circumference that indicated a substantially increased risk of metabolic complications (ABS 2015).

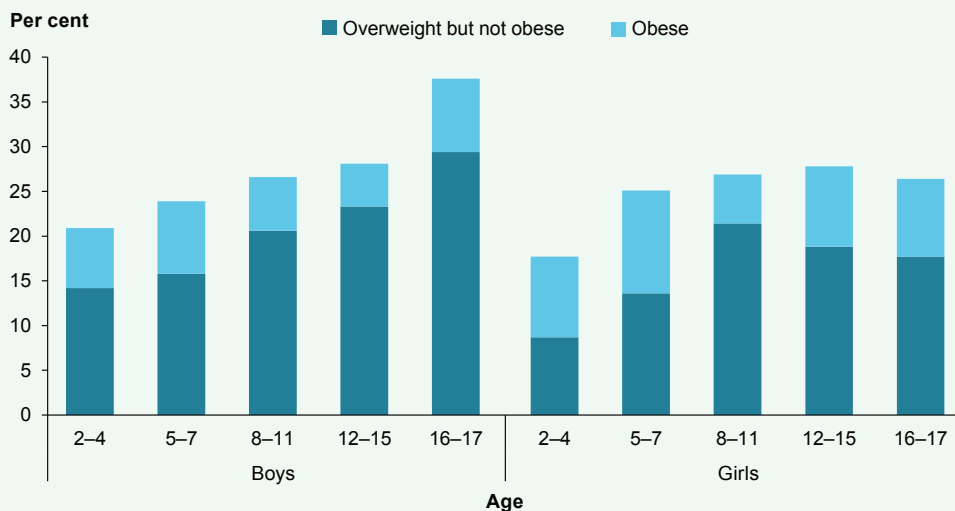
## Children

In 2014–15:

- one in 5 (20%) children aged 2–4 were overweight or obese—11% were overweight but not obese, and 8.7% were obese (ABS 2015)

- more than 1 in 4 (28%) children and young people aged 5–17 were overweight or obese—20% were overweight but not obese, and 7.4% were obese
- for both children and young people aged 2–4 and 5–17, similar proportions of boys and girls were obese
- boys were most likely to be overweight but not obese at age 16–17 (29%), while this was most likely for girls at age 8–11 (21%). The highest prevalence of obesity was at age 16–17 for boys (8.2%) and age 5–7 for girls (12%) (Figure 4.10.2).

**Figure 4.10.2: Proportion of overweight and obese children and young people aged 2–17, by age and sex, 2014–15**



Source: ABS 2015; Table S4.10.2.

## Indigenous Australians

In 2012–13, after adjusting for differences in age structure, Indigenous people aged 18 and over were 1.2 times as likely to be overweight or obese as non-Indigenous people, and 1.6 times as likely to be obese (ABS 2014a). See Chapter 6.5 'Health behaviours of Indigenous Australians' for more information on overweight and obesity among Indigenous Australians.

## Socioeconomic areas

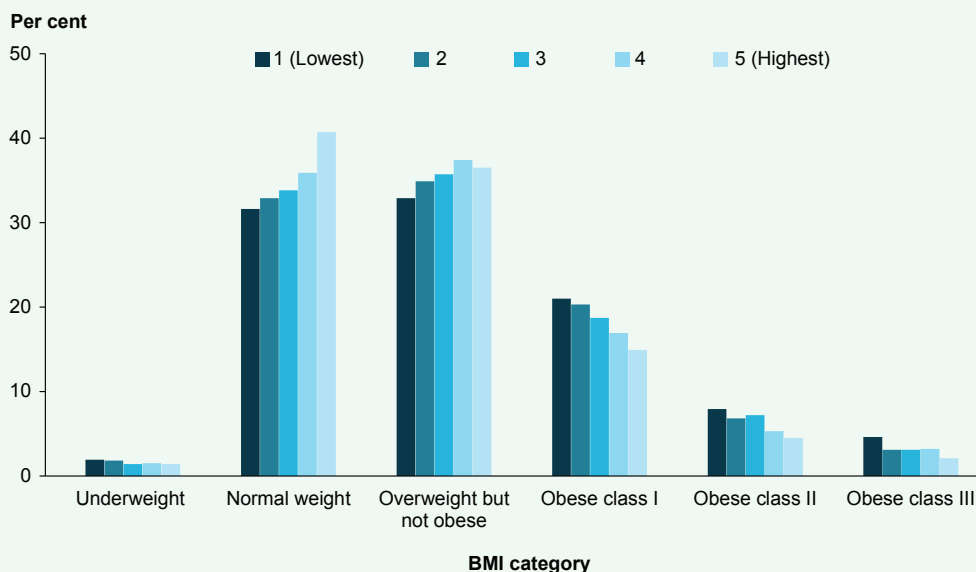
It is well established that social determinants affect a person's health status. In Australia, there is evidence of a gradient in overweight and obesity prevalence across socioeconomic areas (see Glossary).

In 2014–15:

- adults in the lowest socioeconomic area (the lowest fifth) were more likely to be obese (34% for 3 obesity classes combined) than adults in the highest socioeconomic area (22% for 3 obesity classes combined). Adults in the highest socioeconomic area were most likely to have a normal body weight (41%) compared with all other socioeconomic area; adults in the lowest socioeconomic area were least likely (32%) (Figure 4.10.3)

- one-third (33%) of boys aged 2–17 in the lowest socioeconomic area were overweight or obese compared with 22% of boys in the highest socioeconomic area. Similarly, more than one-third (38%) of girls aged 2–17 in the lowest socioeconomic area were overweight or obese compared with 24% of girls in the highest socioeconomic area (ABS 2016b).

**Figure 4.10.3: Proportion of adults in each BMI category, by socioeconomic area, 2014–15**



*Note:* Socioeconomic areas 1–5 refer to area-based fifths derived using the ABS Index of Relative Socio-Economic Disadvantage (ABS 2013b).

*Source:* ABS 2016b; Table S4.10.3.

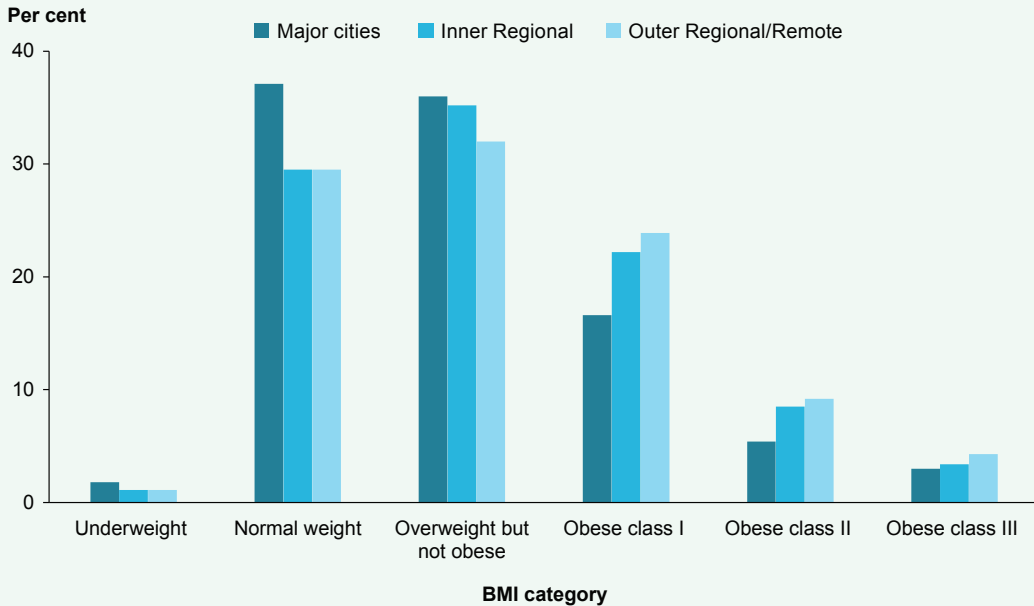
## Geographical variation

One of the major factors associated with overweight and obesity is the area in which an individual lives. This includes their remoteness area and Primary Health Network (PHN) area. In 2014–15:

- adults living in *Major cities* were most likely to have a body weight in the normal weight range (37%), while adults living in *Inner regional* and *Outer regional/Remote* areas were most likely to have a body weight in the obese range (34% and 37%, respectively). There were a greater proportion of obese adults in *Inner regional* and *Outer regional/Remote* areas than in *Major cities*, with the proportion of adults with more severe obesity (Obese class II and III) increasing with increasing remoteness (Figure 4.10.4)
- among children, boys aged 2–17 living in *Outer regional/Remote* areas were 1.3 times as likely to be overweight or obese as boys living in *Major cities* (35% and 27%, respectively). For girls aged 2–17 living in *Outer regional/Remote* areas, the rate of overweight or obesity (36%) was 1.5 times as high as for girls living in *Major cities* (24%). Boys and girls in *Inner regional* areas were the least likely to be overweight or obese (21% and 23%, respectively) (ABS 2015)

- prevalence of overweight and obesity varied among PHNs, from 53% in Northern Sydney to 73% in Country South Australia. Prevalence was higher among regional PHNs (69%) than among metro PHNs (61%). For more information on variation among PHNs see *Healthy communities: overweight and obesity rates across Australia, 2014–15* (AIHW 2016b).

Figure 4.10.4: Proportion of adults in each BMI category, by remoteness area, 2014–15

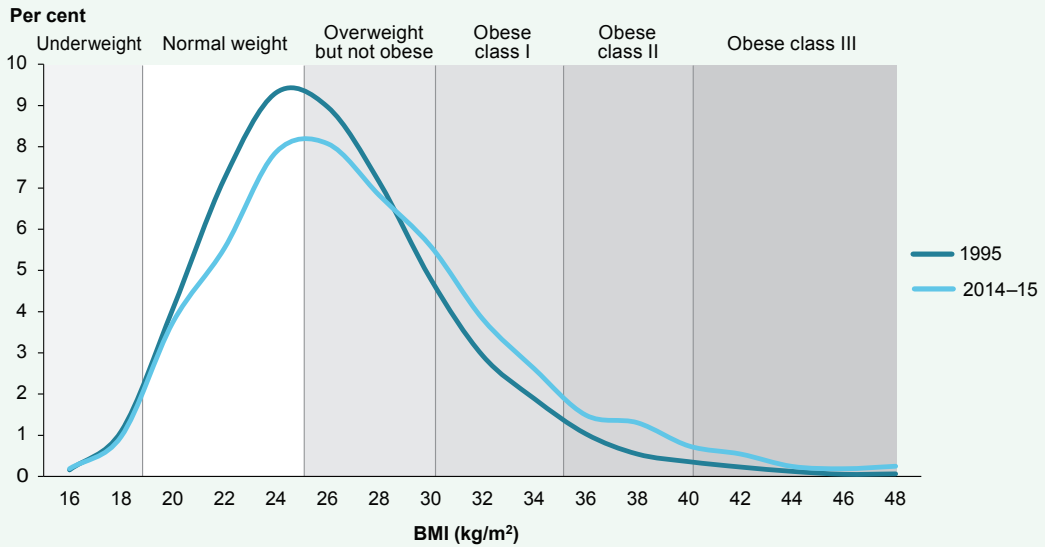


Source: ABS 2016b; Table S4.10.3.

## The growing obesity trend

Over the past 20 years, the distribution of BMI has shifted among Australian adults. Fewer adults are now in the healthy weight range, and more in the obese range. Figure 4.10.5 shows the change in BMI among Australian adults between 1995 and 2014–15.

**Figure 4.10.5: Distribution of BMI, people aged 18 and over, 1995 and 2014–15**



Sources: ABS 2013c, 2016b; Table S4.10.4.

Adults in 2014–15 were significantly more likely to be obese than adults of the same age 20 years earlier for all but one age group. The largest relative difference was at age 18–21: in 2014–15, 15% of adults were obese at age 18–21, almost double the proportion who were obese at the same age in 1995 (7.2%) (AIHW 2017b).

Since 1995, the proportion of Australian adults with a BMI in the more severe obesity ranges (class II and class III obesity) has increased. This proportion almost doubled between 1995 and 2014–15, from 4.9% to 9.4% among Australian adults (Table 4.10.1).

**Table 4.10.1: Age-standardised prevalence of more severe obesity (class II and class III obese), per cent (95% CI), people aged 18 and over, by sex, 1995 to 2014–15**

Year	Men	Women	Persons
1995	3.4 (2.9–4.0)	6.3 (5.5–7.1)	4.9 (4.4–5.4)
2007–08	7.1 (6.1–8.1)	8.7 (7.7–9.7)	7.9 (7.2–8.6)
2011–12	7.9 (7.2–8.6)	11.0 (10.3–11.8)	9.5 (8.9–10.0)
2014–15	8.0 (7.1–8.9)	10.7 (9.8–11.6)	9.4 (8.7–10.0)

*Notes*

1. Class II and class III obesity refers to a measured BMI of 35.00 kg/m<sup>2</sup> or more.
2. The span presented in parentheses is the 95% confidence interval. We can be 95% confident that the true value lies within this interval.

Sources: ABS 2010, 2013c, 2014b, 2016b.

# Why are our waistlines expanding?

Overweight and obesity is influenced by a range of determinants at the individual level, including biological and behavioural factors. As well, the contribution of social and environmental factors is becoming increasingly apparent. The interrelated nature of these factors contributes to the complexity of obesity. For example, individual behaviours such as eating habits can be influenced by social eating norms and by environmental factors such as accessibility to fresh and healthy food (CDC 2015).

## Individual and behavioural factors

At the individual level, having a healthy diet and sufficient physical activity is central to maintaining the body's energy balance (NHMRC 2013a). A person's appetite, satiety, metabolism and body fat distribution can contribute to overweight and obesity; this might be influenced by genetics and epigenetic changes (NHMRC 2013a). Epigenetic changes are alterations in gene expression that can be brought about by a range of factors (for example, intrauterine growth restriction) and passed between generations. These changes can predispose individuals to obesity by influencing how energy balance is regulated (NHMRC 2013a).

As already noted, how Australians live has changed over the past 20 years. Positive changes in health behaviours include a relative drop in consumption of free sugars between 1995 and 2011–12 (ABS 2017). (Free sugars are those added to foods and drinks, and sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates.) Negative changes in health behaviours include an increased consumption of energy-dense, nutrient-poor foods; low consumption of fruit and vegetables; and a move towards less active transport and more sedentary leisure time activities. These behaviours have contributed to an increased obesity prevalence (Allender et al. 2012).

## Obesogenic environment

The term 'obesogenic environment' has been used to describe an environment that promotes obesity among individuals and populations (Swinburn et al. 1999).

### Change in food portion sizes

A study comparing portion sizes from the 1995 National Nutrition Survey and the 2011–12 National Nutrition and Physical Activity Survey found a significant increase (up to 66%) in energy per typical portion in common discretionary foods, including pizza, cake, sausages, cereal bars, processed meats, ice cream and wine (Zheng et al. 2017).

### Built environment

Factors of the built environment (see Glossary) such as low walkability, a high density of convenience food outlets and the relatively cheap price and heavy promotion of energy-dense foods have been shown to contribute to greater energy intake, and less energy expenditure at a population level (Allender et al. 2012). Several studies have noted that access to green space is associated with reduced obesity—this might be due to more recreational walking, more physical activity and less sedentary time (Lachowycz & Jones 2011; WHO 2016).

As the boundaries of Australian cities continue to expand, individuals may have to travel further—with increased travel times—to reach destinations such as workplaces, retail zones, services, food outlets and open public spaces such as parks (Zapata-Diomedes & Veerman 2016). This may mean that active travel (such as walking to a destination) is replaced with less active forms of travel such as car trips (VicHealth 2016). A recent Australian study found that people living 20 km or further away from city centres had an increased waist circumference compared with people who lived less than 9 km from a city centre (Sugiyama et al. 2016).

## Changing work lives

Australians are now spending more hours at work. The OECD ranks Australia 10th of 38 included member and partner countries for the proportion of its workers (13%) working ‘very long hours’ (50 hours or more per week as defined by the OECD) (OECD 2015). The workplace environment and its surrounds can have an adverse impact on the health of adults (AIHW 2012). Influencing factors include the proximity of food outlets, long working hours, access to food vending machines, event catering, and public transport access.

Occupation also plays a role, with predominantly office-type settings being associated with sedentary work (Parry & Straker 2013). This, in turn, has been linked to weight gain and to chronic conditions such as heart disease, diabetes and cancer (independent of the amount of time spent on physical activity) (Thorp et al. 2011; Wilmot et al. 2012).

For many families with all adults in paid employment, longer working hours leaves less time for food preparation, family recreation and physical activity (Australian National Preventative Health Agency 2014). Meal times are often fragmented: people may eat at different times and in different places (often outside the home) and rely heavily on snack and convenience foods. More than 58% of Australians’ total food spending in 2014 was on discretionary food items, including potato chips, processed meats, soft drinks and chocolates (ABS 2016a).

## School environment

Foods in school facilities such as canteens, cafeterias and vending machines can influence the choices and intake of students, with children and adolescents consuming up to two meals and snacks per day at school, 5 days a week (Espinel & King 2009). School policies may regulate the food available for purchase, however, and supportive play equipment and activity programs can encourage students to participate in physical activity (Escalante et al. 2013).

The majority of schools across Australia use a ‘traffic light’ scheme to classify foods sold in canteens—red foods are restricted, amber foods should not dominate and healthy green food should fill the menu (Hills et al. 2015). Strategies such as these support the healthy eating of Australian schoolchildren through increased availability and promotion of healthy food and drinks in schools (NSW Department of Education 2017). Such policies have proved influential: a previous canteen strategy in New South Wales that used the traffic light approach saw a rise in the proportion of schools offering no energy-dense, nutrient-poor (red) food items on their menu, from 7.0% in 2007 to 22% in 2010 (Hills et al. 2015).

## Technology

In the home environment, Australian children and young people now spend about 20% of their waking lives in front of screens on weekdays, and 30% on weekends—including watching television, being on computers, and playing electronic games (Australian Institute of Family Studies 2015). Screen-based activities in young people and adults are strongly linked to obesity, with higher obesity rates associated with higher screen time (independent of physical activity) (Banks et al. 2011; Boone et al. 2007). Fewer hours of screen time in adolescence has also been shown to reduce the likelihood of obesity in adulthood (Boone et al. 2007).

Use of electronic devices such as smart phones and tablets during normal sleep time has been found to be associated with overweight and obesity among young people. Among a sample of 3,700 adolescents (in school grades 6, 8 and 10) in New South Wales, young people who usually used electronic devices during normal sleep time were 1.3 times as likely to be overweight or obese as adolescents who sometimes or never did (Mihirshahi et al. 2017).

## Food advertising

The WHO found that the advertising of unhealthy food influences children's food preferences, purchase requests and consumption patterns (WHO 2010). The average Australian child will be exposed to 35 hours of food advertising on television over the course of a year, of which over half will be for unhealthy foods (King et al. 2013). The Australian food industry responded in 2009 with initiatives to limit the exposure of unhealthy food advertising to children, but a recent study showed there had been no subsequent change in this exposure in Australia from 2011 to 2015 (Watson et al. 2017).

## Health burden of overweight and obesity

The health consequences of overweight and obesity are considerable. Burden of disease analyses have shown that, in 2011, 7.0% of the total burden of disease in Australia was due to overweight and obesity, with 63% of this due to fatal burden. Men (7.3%) had a greater burden of disease from overweight and obesity than women (6.6%) (AIHW 2017a). See Chapter 4.4 'Contribution of selected risk factors to burden of disease' for more information on burden of disease.

Being overweight or obese is also associated with higher mortality. A recent study of adults with a BMI above the 'normal weight' range (that is, a BMI of at least 25 kg/m<sup>2</sup>) showed the risk of death from all causes rose by 31% with each 5 kg/m<sup>2</sup> increase in BMI in Australian and New Zealand populations (di Angelantonio et al. 2016). An investigation into the effect of obesity on life expectancy found that, compared with people with a normal BMI, life expectancy was reduced by 2–4 years for people with class I obesity, and by 8–10 years for people with class III obesity (NHMRC 2013a; PSC 2009).

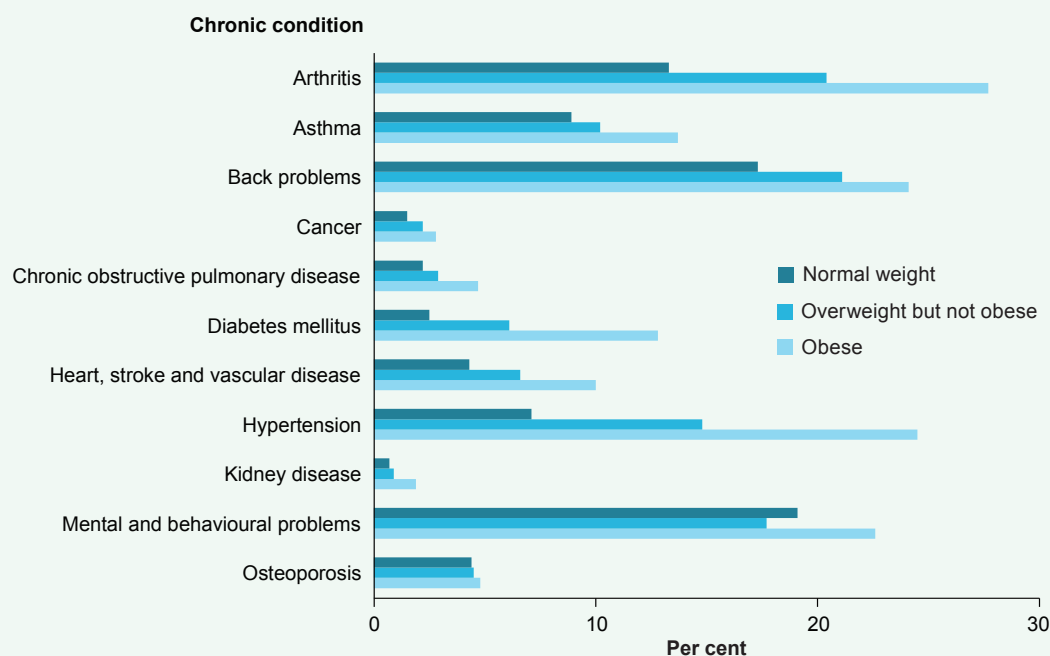


# Chronic conditions among overweight and obese adults

Among adults, overweight and obesity increases the likelihood of developing many chronic conditions, including some cancers, some cardiovascular diseases, asthma, back pain and problems, chronic kidney disease, dementia, diabetes, gallbladder disease, gout, and osteoarthritis (AIHW 2017a).

In 2014–15, Australian adults who were overweight or obese reported higher rates of many chronic conditions than adults of normal weight (Figure 4.10.6). For several conditions, obese adults were more likely to report that they had a chronic condition than adults who were overweight but not obese, who in turn reported higher rates than adults of normal weight (ABS 2015).

**Figure 4.10.6: Prevalence of selected chronic conditions in adults, by BMI category, 2014–15**



Source: ABS 2015; Table S4.10.6.

## Economic impact of overweight and obesity

Illnesses associated with overweight and obesity have a considerable impact on the Australian economy; PwC Australia estimated that obesity cost it \$8.6 billion in 2011–12 (in 2014–15 dollars). This included an estimated \$3.8 billion in direct costs and \$4.8 billion in indirect costs (for example, absenteeism and government subsidies), but did not account for further costs from reduced wellbeing and forgone earnings (PwC Australia 2015). The report estimated that, if no further action is taken to slow the rise in obesity, there will be \$87.7 billion in added costs due to obesity over a 10-year period (2015–16 to 2024–25).

In 2014–15, more than 124,600 procedures relating to weight-loss surgery were billed to Medicare—in public and private hospitals, and in non-hospital settings. In public hospitals, the estimated total cost of the 10 most common weight loss surgery procedures was \$30.4 million. The total cost for these Medicare-billed procedures in public and private hospitals, and non-hospital settings combined, was about \$62.8 million, with about \$25.7 million in benefits paid by Medicare, and about \$37.1 million paid in out-of-pocket costs by patients and/or health insurers (AIHW 2017c).

## What is missing from the picture?

More regular and extensive monitoring of body weight and waist circumference and of the risk factors contributing to overweight and obesity (both behavioural and environmental) would contribute to a greater understanding of which obesity prevention strategies are working, and for whom and where.

Robust data on the contribution of genetic and epigenetic factors to overweight and obesity in Australia are currently limited. Data of this kind would help to better understand the genetic and molecular basis of obesity and shed light on the complex interplay of individual and environmental factors leading to this health risk factor.

## Where do I go for more information?

More information on overweight and obesity is available at <[www.aihw.gov.au/reports-statistics/behaviours-risk-factors/overweight-obesity/overview](http://www.aihw.gov.au/reports-statistics/behaviours-risk-factors/overweight-obesity/overview)>.

The following reports are available for free download:

- *A picture of overweight and obesity in Australia 2017*
- *Overweight and obesity in Australia: a birth cohort analysis*
- *Healthy communities: overweight and obesity rates across Australia, 2014–15*
- *Impact of overweight and obesity as a risk factor for chronic conditions: Australian Burden of Disease Study series no.11*
- *Weight loss surgery in Australia 2014–15: Australian hospital statistics.*

## References

- ABS (Australian Bureau of Statistics) 2010. Microdata: National Health Survey: summary of results, 2007–2008 (reissue). ABS cat. no. 4364.0. Canberra: ABS. AIHW analysis of Expanded Confidentialised Unit Record File.
- ABS 2013a. Australian Health Survey: updated results, 2011–2012. ABS cat. no. 4364.0.55.003. Canberra: ABS.
- ABS 2013b. Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA), Australia, 2011. ABS cat. no. 2033.0.55.001. Canberra: ABS.
- ABS 2013c. Microdata: National Nutrition Survey, 1995. ABS cat. no. 4807.0.30.001. Canberra: ABS.
- ABS 2014a. Australian Aboriginal and Torres Strait Islander Health Survey: updated results, 2012–13. ABS cat. no. 4727.0.55.006. Canberra: ABS. AIHW analysis of Basic Confidentialised Unit Record File.
- ABS 2014b. Microdata: Australian Health Survey, core content—risk factors and selected health conditions, 2011–12. ABS cat. no. 4324.0.55.003. Canberra: ABS. AIHW analysis of Expanded Confidentialised Unit Record File.
- ABS 2015. National Health Survey: first results, 2014–15. ABS cat. no. 4364.0.55.001. Canberra: ABS.
- ABS 2016a. Consumer Price Index, Australia, Dec. 2015. ABS cat. no. 6401.0. Canberra: ABS.

- ABS 2016b. Microdata: National Health Survey, 2014–15. ABS cat. no. 4324.0.55.001. Canberra: ABS. AIHW analysis of Expanded Confidentialised Unit Record File.
- ABS 2017. Australian Health Survey: consumption of added sugars, 2011–12. ABS cat. no. 4364.0.55.011. Canberra: ABS.
- AIHW (Australian Institute of Health and Welfare) 2012. Australia's food and nutrition. Cat. no. PHE 163. Canberra: AIHW.
- AIHW 2016a. Australia's health 2016. Australia's health series no. 15. Cat. no. AUS 199. Canberra: AIHW.
- AIHW 2016b. Healthy communities: overweight and obesity rates across Australia, 2014–15. Cat. no. HPF 2. Canberra: AIHW.
- AIHW 2017a. Impact of overweight and obesity as a risk factor for chronic conditions: Australian Burden of Disease Study. Australian Burden of Disease Study series no. 11. Cat. no. BOD 12. Canberra: AIHW.
- AIHW 2017b. Overweight and obesity in Australia: a birth cohort analysis. Cat. no. PHE 215. Canberra: AIHW.
- AIHW 2017c. Weight loss surgery in Australia 2014–15: Australian hospital statistics. Cat. no. HSE 186. Canberra: AIHW.
- Allender S, Gleeson E, Crammond B, Sacks G, Lawrence M, Peeters A et al. 2012. Policy change to create supportive environments for physical activity and healthy eating: which options are the most realistic for local government? *Health Promotion International* 27(2):261–74.
- Australian Institute of Family Studies 2015. Australian children's screen time and participation in extracurricular activities. Melbourne: Australian Institute of Family Studies.
- Australian National Preventative Health Agency 2014. Obesity: prevalence trends in Australia. Canberra: Australian National Preventative Health Agency.
- Banks E, Jorm L, Rogers K, Clements M & Bauman A 2011. Screen-time, obesity, ageing and disability: findings from 91,266 participants in the 45 and Up Study. *Public Health Nutrition* 14:34–43.
- Boone JE, Gordon-Larsen P, Adair LS & Popkin BM 2007. Screen time and physical activity during adolescence: longitudinal effects on obesity in young adulthood. *International Journal of Behavioral Nutrition and Physical Activity* 4:26.
- CDC (Centers for Disease Control and Prevention) 2015. Health Equity Resource Toolkit for State Practitioners Addressing Obesity Disparities. Atlanta: CDC.
- Cole TJ, Bellizzi MC, Flegal KM & Dietz WH 2000. Establishing a standard definition for child overweight and obesity worldwide: international survey. *BMJ* 320:1240–3.
- Department of Health 2009. About overweight and obesity. Canberra: Department of Health. Viewed 23 June 2017, <<http://www.health.gov.au/internet/main/publishing.nsf/content/health-publhlth-strateg-hlthwt-obesity.htm>>.
- di Angelantonio E, Bhupathiraju SN, Wormser D, Gao P, Kaptoge S, de Gonzalez AB et al. 2016. Body-mass index and all-cause mortality: individual-participant-data meta-analysis of 239 prospective studies in four continents. *The Lancet* 388:776–86.
- Escalante Y, García-Hermoso A, Backx K & Saavedra JM 2013. Playground designs to increase physical activity levels during school recess. *Health Education & Behavior* 41:138–44.
- Espinell P & King L 2009. A framework for monitoring overweight and obesity in NSW. Sydney: NSW Department of Health, Physical Activity Nutrition Obesity Research Group.
- Hills A, Nathan N, Robinson K, Fox D & Wolfenden L 2015. Improvement in primary school adherence to the NSW Healthy School Canteen Strategy in 2007 and 2010. *Health Promotion Journal of Australia* 26:89–92.
- King L, Hebden L, Grunseit L, Kelly B & Chapman K 2013. Building the case for independent monitoring of food advertising on Australian television. *Public Health Nutrition* 16:2249–54.
- Lachowycz K & Jones AP 2011. Greenspace and obesity: a systematic review of the evidence. *Obesity Reviews* 12:e183–e9.
- Mihrshahi S, Drayton B, Bauman A & Hardy L 2017. Associations between childhood overweight, obesity, abdominal obesity and obesogenic behaviours and practices in Australian homes. *BMC Public Health* 18:44.
- NHMRC (National Health and Medical Research Council) 2013a. Clinical practice guidelines for the management of overweight and obesity in adults, adolescents and children in Australia. Canberra: NHMRC.
- NHMRC 2013b. Australian Dietary Guidelines. Canberra: NHMRC.

New South Wales Department of Education 2017. Why we need a strategy for providing healthy food and drink in NSW schools. Sydney: NSW Department of Education. Viewed 25 January 2018, <<https://healthyschoolcanteens.nsw.gov.au/about-the-strategy/why-we-need-this-strategy>>.

OECD (Organisation for Economic Co-operation and Development) 2015. Work-life balance. Paris: OECD Publishing. Viewed 15 December 2017, <<http://www.oecdbetterlifeindex.org/topics/work-life-balance/>>.

OECD 2017. Overweight and obesity among adults. In: Health at a glance 2017: OECD indicators. Paris: OECD Publishing.

Parry S & Straker L 2013. The contribution of office work to sedentary behaviour associated risk. *BMC Public Health* 13:296.

PSC 2009. Body-mass index and cause-specific mortality in 900,000 adults: collaborative analyses of 57 prospective studies. *Lancet* 373:1083–96.

PwC Australia 2015. Weighing the cost of obesity: a case for action. Australia: PwC Australia.

Sugiyama T, Niyonsenga T, Howard N, Coffee N, Paquet C, Taylor A et al. 2016. Residential proximity to urban centres, local-area walkability and change in waist circumference among Australian adults. *Preventive Medicine* 93:39–45.

Swinburn B, Egger G & Raza F 1999. Dissecting obesogenic environments: the development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Preventive Medicine* 29:563–70.

Thorp A, Owen N, Neuhaus M & Dunstan D 2011. Sedentary behaviours and subsequent health outcomes in adults: a systematic review of longitudinal studies 1996–2011. *American Journal of Preventative Medicine* 41:207–15.

VicHealth 2016. Physical activity and sedentary behaviour: evidence summary. Melbourne: Victorian Health Promotion Foundation.

Watson W, Lau V, Wellard L, Hughes C & Chapman K 2017. Advertising to children initiatives have not reduced unhealthy food advertising on Australian television. *Journal of Public Health (Oxford)* 39(4):787–92.

WHO (World Health Organization) 2000. Obesity: preventing and managing the global epidemic. Report of a WHO consultation. WHO Technical Report series 894:i–xii, 1–253.

WHO 2010. Set of recommendations on the marketing of foods and non-alcoholic beverages to children. Geneva: WHO.

WHO 2011. Waist circumference and waist-hip ratio: report of a WHO expert consultation. Geneva, 8–11 December 2008.

WHO 2016. Urban green spaces and health. Copenhagen: WHO.

Wilmot EG, Edwardson CL, Achana FA, Davies MJ, Gorely T, Gray LJ et al. 2012. Sedentary time in adults and the association with diabetes, cardiovascular disease and death: systematic review and meta-analysis. *Diabetologia* 55:2895–905.

Zapata-Diomedes B & Veerman JL 2016. The association between built environment features and physical activity in the Australian context: a synthesis of the literature. *BMC Public Health* 16:484.

Zheng M, Rangan A, Meertens B & Wu J 2017. Changes in typical portion sizes of commonly consumed discretionary foods among Australian adults from 1995 to 2011–2012. *Nutrients* 9:E577.

# 4.11 Biomedical risk factors

Biomedical risk factors are bodily states that have an impact on a person's risk of disease. This snapshot focuses on three biomedical risk factors: blood pressure, blood lipids and blood glucose—elevated levels of which have been directly linked to specific health outcomes such as cardiovascular disease, chronic kidney disease and diabetes. Obesity, which is also a biomedical risk factor, is discussed in Chapter 4.10 'Overweight and obesity'. The information in this snapshot is based on the Australian Bureau of Statistics 2011–12 Australian Health Survey (ABS 2013) and 2014–15 National Health Survey (ABS 2017).

## High blood pressure

High blood pressure—also known as hypertension—is a risk factor for chronic conditions, including heart failure, chronic kidney disease and stroke. See Chapter 3 for more information on these chronic conditions.

In 2014–15, an estimated 1 in 3 (34%, or 6 million) Australian adults had high blood pressure. This comprised 23% who had uncontrolled high blood pressure and 11% whose blood pressure was controlled by blood pressure medication.

The proportion of men with high blood pressure was slightly higher than for women (35% and 32%, respectively) and increased with age, being highest in people aged 75 and over (82%) (ABS 2014; Supplementary Table S4.11.1).

## Abnormal blood lipids

Abnormal levels of blood lipids, such as cholesterol and triglycerides—also known as dyslipidaemia—can lead to the build-up of fatty deposits in the blood vessels and contribute to the risk of cardiovascular disease.

In 2011–12, an estimated 2 in 3 (65%, or 8.4 million) Australian adults had abnormal blood lipid levels. This included 59% with uncontrolled blood lipids and 6.7% with normal blood lipid levels who were taking lipid-modifying medication (ABS 2014; Supplementary Table S4.11.2).

## Impaired glucose regulation

Impaired glucose regulation is a condition where blood glucose levels are higher than normal, but not high enough to be regarded as type 2 diabetes. People with impaired glucose regulation are at increased risk of diabetes and cardiovascular disease.

Measurement of blood glucose levels after fasting provides a measure of glucose regulation.

In 2011–12, an estimated 3.1% (416,000) Australian adults had impaired glucose regulation, affecting a greater proportion of men (4.1%) than women (2.1%). Impaired glucose regulation was highest in people aged 75 and over (7.5%).

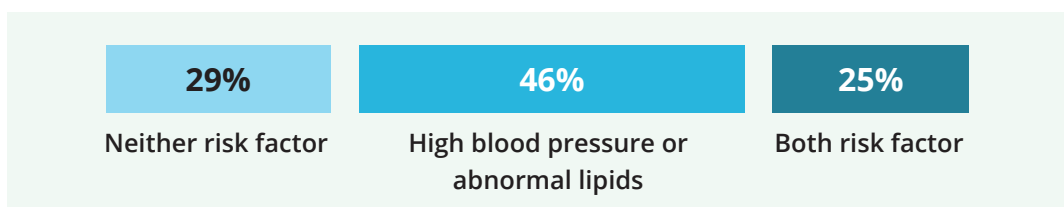


## Multiple biomedical risk factors

Biomedical risk factors can have an interactive or cumulative effect on disease risk. Multiple risk factors can increase the risk of disease, lead to earlier disease onset, increase severity and complicate treatment.

The development of one risk factor can lead to the occurrence of another, or they may have shared causes. For example, high blood pressure and dyslipidaemia are often related to poor diet and being overweight.

- In 2011–12, an estimated 1 in 4 (25%) Australian adults had both high blood pressure and abnormal blood lipids. This increased with age, from 4.3% in people aged 18–34 to 65% in people aged 75 and over.
- Almost 3 in 4 (71%) adults had either high blood pressure, abnormal blood lipids or both risk factors. This was highest in people aged 75 and over (96%) (ABS 2014; Supplementary Table S4.11.3).



## Managing risk factors

Treating or managing biomedical risk factors includes changes in lifestyle (such as dietary modifications or increased physical activity), use of medications, and surgery. Improvements in biomedical risk factors can prevent disease, delay disease progression and improve treatment outcomes, and have the potential to improve the health of the population.

- In 2014–15, an estimated 15% of adults had measured high blood pressure but were not taking any blood pressure medication.
- Around 8.1% of adults with measured high blood pressure reported that they took medicines to lower blood pressure. Measured high blood pressure, despite the use of medication, was highest in people aged 75 and over (33%) (ABS 2014; Supplementary Table S4.11.1).
- In 2011–12, the majority of people with measured dyslipidaemia (87%) were not using lipid modifying medications. This reflects current guidelines, which state that prescription of lipid modifying medications is not based on abnormal blood lipids alone, but on the absolute risk of cardiovascular disease (RACGP 2016). The absolute risk of cardiovascular disease considers risk factors, such as blood pressure and cholesterol levels, in combination.
- A total of 7.7% of people were identified as having abnormal blood lipids, despite reporting using lipid lowering medications. Poorly controlled blood lipids, despite the use of medication, was highest in people aged 65–74 (20%) (ABS 2014; Supplementary Table S4.11.4).

## What is missing from the picture?

National surveys collecting information on biomedical risk factors are infrequent. The most recent national data on blood lipid and blood glucose levels were collected in 2011–12. More surveys will be needed to continue to monitor the levels of these risk factors in the Australian population.

## Where do I go for more information?

More information on biomedical risk factors is available at <[www.aihw.gov.au/reports-statistics/behaviours-risk-factors/biomedical-risk-factors/overview](http://www.aihw.gov.au/reports-statistics/behaviours-risk-factors/biomedical-risk-factors/overview)>.

The report *Cardiovascular disease, diabetes and chronic kidney disease—risk factors* is available for free download.

## References

ABS (Australian Bureau of Statistics) 2013. Australian Health Survey: users' guide, 2011–13. ABS cat. no. 4363.0.55.001. Canberra: ABS.

ABS 2014. Microdata: Australian Health Survey, core content—risk factors and selected health conditions, 2011–12. ABS cat. no. 4324.0.55.003. Canberra: ABS. AIHW analysis of Expanded Confidentialised Unit Record File.

ABS 2016. Microdata: National Health Survey, 2014–15. ABS cat. no. 4324.0.55.001. Canberra: ABS. AIHW analysis of Expanded Confidentialised Unit Record File.

ABS 2017. National Health Survey: users' guide, 2014–15. ABS cat. no. 4363.0. Canberra: ABS.

RACGP (The Royal Australian College of General Practitioners) 2016. Guidelines for preventive activities in general practice. 9th edn. East Melbourne, Victoria: RACGP.



## 4.12 Antenatal risk factors

A mother's antenatal characteristics, such as age, weight and whether she smoked or drank alcohol during pregnancy, influences the health outcomes of a mother and her child. Data on maternal and baby outcomes are collected by health professionals for the National Perinatal Data Collection at the AIHW. This snapshot uses these data to explore aspects of the mother, and her child's health.

### Women are giving birth later in life

The age when a woman gives birth can be a risk factor for obstetric and perinatal outcomes. Adverse outcomes are more likely in women aged under 20 and over 40. Consistent with recent trends in Australia, women are continuing to give birth later in life, with the average age rising from 29.7 in 2005 to 30.3 in 2015. The average age of first-time mothers is also rising, from 28.1 in 2005 to 28.9 in 2015.



### 99.9% of women had at least one antenatal visit

Antenatal care is associated with positive child and maternal health outcomes, with regular antenatal care visits in the first trimester (before 14 weeks' gestational age), leading to fewer interventions in late pregnancy and positive outcomes for child health. The Australian Antenatal Guidelines recommend that the first antenatal visit occur within the first 10 weeks of pregnancy and that first-time mothers with an uncomplicated pregnancy attend 10 visits (7 visits for later uncomplicated pregnancies) (AHMAC 2012). Almost all mothers (99.9%) who gave birth in 2015 had at least 1 antenatal visit, 95% had 5 or more visits, and 58% had 10 or more. In 2015, 47% of mothers attended at least 1 antenatal visit in the first 10 weeks of pregnancy; 10% did not start antenatal care until after 20 weeks' gestation.

### 1 in 10 women smoked during pregnancy

Smoking during pregnancy is a preventable risk factor associated with poorer perinatal outcomes like low birthweight, preterm birth and an increase in perinatal death. Of all mothers who gave birth in 2015, 1 in 10 (10%) reported smoking at some point during their pregnancy (a reduction from 15% in 2009).



Rates of smoking were slightly higher in the first 20 weeks of pregnancy (10%) compared with after 20 weeks of pregnancy (7.6%). In 2015, almost 1 in 4 (23%) of the more than 30,400 mothers who gave birth reported smoking during the first 20 weeks of pregnancy (but not throughout the rest of their pregnancy). The rate for reported smoking during the first 20 weeks of pregnancy was highest for women aged under 20 (32%).

## 1 in 5 women were obese during pregnancy

Being overweight or obese during pregnancy contributes to an increased risk of complications throughout pregnancy and delivery. Pregnant women who are obese have an increased risk of thromboembolism, pre-eclampsia, gestational diabetes, post-partum haemorrhage and wound infections. Babies of mothers who are obese have higher rates of neonatal death, congenital anomaly and stillbirth compared with babies of mothers who are not obese (CMACE & RCOG 2010).

### Of mothers who gave birth in 2015

- 3.9% were underweight (BMI <18.50)
- 50% were in the normal weight range (BMI 18.50–24.99)
- 26% were overweight but not obese (BMI 25.00–29.99)
- 20% were classified as obese (BMI ≥30.00)

## Alcohol consumption and domestic violence during pregnancy

Fetal Alcohol Spectrum Disorder describes the range of effects that can occur in a baby who has been exposed to alcohol in its mother's womb (Burns et al. 2013; NHMRC 2009). According to the National Drug Strategy Household Survey, 56% of women abstained from drinking during pregnancy in 2016, an increase from 40% in 2007.

About 1 in 2 (49%) women consumed alcohol before they knew they were pregnant. A large proportion of these women stopped drinking alcohol once they found out they were pregnant, but 1 in 4 (25%) continued to drink after they found out they were pregnant (AIHW 2017).

Domestic violence is a leading preventable contributor to death, disability and illness for women aged 15–44. Data from the Australian Bureau of Statistics 2016 Personal Safety Survey indicate that an 'estimated 187,800 women who experienced violence by a current partner were pregnant at some point during the relationship. Of the women surveyed, nearly 1 in 5 (18%) experienced violence during their pregnancy' (ABS 2017).

## What is missing from the picture?

Routine administrative data, as opposed to survey data, are needed on several key antenatal risk factors, including alcohol consumption and domestic violence during pregnancy.

## Where do I go for more information?

The information in this article was largely drawn from *Australia's mothers and babies 2015—in brief*. Other AIHW publications used for this article were *National Drug Strategy Household Survey, 2016* and *Screening for domestic violence during pregnancy: options for future reporting in the National Perinatal Data Collection*.

## References

- ABS (Australian Bureau of Statistics) 2017. Personal Safety, Australia 2016. ABS cat. no. 4906.0. Canberra: ABS.
- AHMAC (Australian Health Ministers' Advisory Council) 2012. Clinical Practice Guidelines: Antenatal Care—Module 1. Canberra: Department of Health.
- AIHW (Australian Institute of Health and Welfare) 2017. National Drug Strategy Household Survey—detailed findings: 2016. Drug statistics series no. 31. Cat. no. PHE 214. Canberra: AIHW.
- Burns L, Breen C, Bower C, O'Leary C & Elliot EJ 2013. Counting fetal alcohol spectrum disorder in Australia: the evidence and the challenges. *Drug Alcohol Review* 32(5):461–7.
- CMACE & RCOG (Centre for Maternal and Child Enquiries & Royal College of Obstetricians and Gynaecologists) 2010. Management of women with obesity in pregnancy. CMACE/ RCOG Joint Guideline. Viewed 17 August 2017, <<https://www.rcog.org.uk/globalassets/documents/guidelines/cmacercojointguidelinemanagementwomenobesitypregnancya.pdf>>.
- NHMRC (National Health and Medical Research Council) 2009. Australian Guidelines to Reduce Health Risks from Drinking Alcohol. Canberra: NHMRC.

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# Chapter 5

## Health of population groups



## 5.0 Overview

Where you live, how much you earn, whether you have disability—and a raft of other factors—can affect your health status and health outcomes. This chapter explores the different health experiences of certain population groups in Australia: socioeconomic groups; rural and remote populations; culturally and linguistically diverse populations; people with disability; lesbian, gay, bisexual, transgender and intersex people; veterans; and prisoners. Some of these groups experience higher rates of illness, disability and death, and are more likely to engage in risky health behaviours (such as tobacco smoking) than the general population. Aboriginal and Torres Strait Islander people also face major health disparities; these are examined in detail in Chapter 6.

In 2014–15, people living in the lowest socioeconomic group were 2.6 times as likely as people in the highest group to have diabetes, and 1.7 times as likely to have heart, stroke or vascular disease. Death rates were nearly 1.5 times as high for people in the lowest socioeconomic group than for people in the highest group—with even higher death rate differences for specific causes, such as chronic obstructive pulmonary disease (2.2 times) and lung cancer (1.8 times). People in the lowest socioeconomic group were more likely than people in the highest group to smoke daily (2.7 times).

Around 3 in 10 (29%, 7 million people) Australians live in rural and remote areas. Rural and remote populations can face multiple challenges due to their geographic isolation, and often experience poorer health outcomes than people living in cities. The proportion of adults engaging in many behaviours associated with poorer health is higher in rural and remote areas than in metropolitan areas (for example, 22% of people in *Outer regional/Remote* areas smoke daily compared with 13% of people in *Major cities*). In 2015, people living in *Very remote* areas had a mortality rate almost 1.4 times as high as people living in *Major cities*.

More than 1 in 4 (26%) Australians were born overseas. As a population group, immigrants often have lower mortality rates and self-reported chronic conditions than Australian-born residents. This 'healthy migrant effect' could be partly due to health screenings people must pass before migration. However, culturally and linguistically diverse populations are a heterogeneous group with different health experiences. For example, in 2016, people born in Malaysia had lower rates of mortality than Australian-born residents but the rates for people born in Scotland were higher.

As a group, the 4.3 million (18%) Australians with disability experience poorer health than people without disability. People with disability are around 7 times as likely as people without disability to assess their health as poor or fair (41% compared with 6.5%) and this rises to 10 times as likely for people with severe or profound core activity limitation (61%). People with disability are also more likely than people without disability to have mental health conditions—almost half (47%) of people with severe or profound core activity limitation, and more than one-third (37%) of other people with disability, self-reported that they had anxiety-related problems, compared with 11% of people without disability.

It is estimated that Australians of diverse sexual orientation, sex or gender identity may account for up to 11% of the population—LGBTI (lesbian, gay, bisexual, transgender, or intersex) is the abbreviation often used to refer to this population group. Part of the challenge in identifying and reporting on the health of this population stems from a lack of specific data; however, there is evidence that LGBTI people face disparities in terms of their mental health, sexual health and rates of substance use. For example, almost 1 in 3 (32%) homosexual/bisexual people aged 16 and over in Australia met the criteria for an anxiety disorder in the previous 12 months, compared with 1 in 7 (14%) heterosexual people.

The service experience of members of the Australian Defence Force (ADF) may affect their health needs as veterans. Several studies have recognised a ‘healthy soldier effect’, due mainly to the ongoing need to keep fit and having ready access to health care during service. Ex-serving men have a lower all-cause mortality rate than all Australian men of the same age. Men aged 55 and over who served in the ADF generally report similar rates of selected chronic conditions—arthritis, back pain and problems, chronic obstructive pulmonary disease, diabetes, diseases of the circulatory system, and mental and behavioural problems—compared with men of the same age who have not served. There is ongoing concern about the incidence of suicide among serving and ex-serving ADF personnel. Although suicide rates among men serving full time or in the reserves are lower than rates for all Australian men, the rates for ex-serving personnel are higher. For ex-serving men aged 18–29, the rate is 1.7 times as high as that for all Australian men of the same age. There are substantial gaps in our understanding of women’s experiences in the ADF. This is due to the historically small number of women represented in the ADF, which has limited this research.

On average, prisoners have poorer health than the general Australian population and greater levels of risk factors for poor health—1 in 2 (50%) prison entrants had a history of mental health conditions, 1 in 3 (31%) had a current chronic condition and 3 in 4 (74%) were current smokers in 2015. Australia’s prison population is ageing—the number of prisoners aged 50 and over increased by 84% between 2005 and 2015—and older prisoners (like older people in the general population) are more likely to suffer from chronic conditions and disability.

# 5.1 Socioeconomic groups

Socioeconomic factors are important determinants of health. Generally, people in lower socioeconomic groups are at greater risk of poor health, have higher rates of illness, disability and death, and live shorter lives than people from higher socioeconomic groups (Mackenbach 2015). The higher a person's socioeconomic position, the healthier they tend to be—a phenomenon often termed the 'social gradient of health' (see Chapter 4.2 'Social determinants of health').

This snapshot compares socioeconomic groups on a range of health measures across 4 key health areas, focusing on people in the lowest and highest socioeconomic groups, where differences are usually large. It highlights that for almost all health measures, people from lower socioeconomic groups in Australia fare worse.

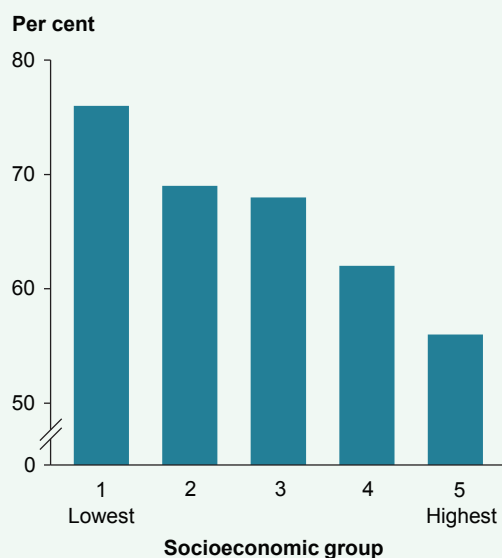
Socioeconomic position was determined using the Index of Relative Socio-Economic Disadvantage (IRSD) (ABS 2013). The IRSD is a measure based on where people live, and reflects the overall or average level of socioeconomic disadvantage of the population of an area (see Glossary).

## Health risk factors

On most health risk factors, people in the lowest socioeconomic group fared worse than people in the highest socioeconomic group. In particular, it is estimated they were:

- 2.7 times as likely to smoke daily in 2016
- 1.6 times as likely to be obese in 2014–15
- 1.4 times as likely to be inactive or insufficiently active in 2014–15 (Figure 5.1.1)
- 1.2 times as likely to have high blood pressure in 2014–15
- at similar lifetime risk of harm from drinking alcohol in 2016.

**Figure 5.1.1: Proportion of adults who were inactive or insufficiently active, by socioeconomic group, 2014–15**



Source: ABS 2015; Table S5.1.1.

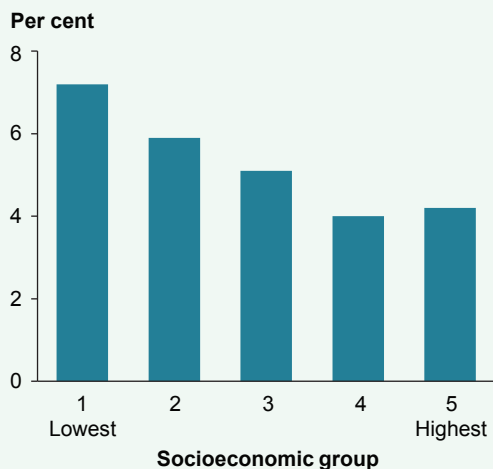


## Chronic conditions

Rates of chronic conditions were also higher for people in the lowest socioeconomic group, compared with people in the highest socioeconomic group. In particular, it is estimated they were:

- 2.7 times as likely to have chronic obstructive pulmonary disease in 2014–15
- 2.6 times as likely to have diabetes in 2014–15 (ABS 2015)
- 1.7 times as likely to have heart, stroke or other vascular disease in 2014–15 (Figure 5.1.2)
- 1.7 times as likely to be newly diagnosed with lung cancer in 2008–2012
- 1.6 times as likely to have biomedical signs of chronic kidney disease in 2011–12.

Figure 5.1.2: Prevalence of heart, stroke and vascular disease, by socioeconomic group, 2014–15



Source: ABS 2015; Table S5.1.2.

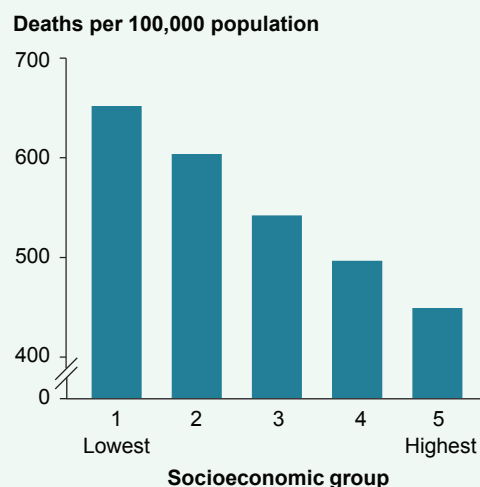
## Mortality

In 2015, the all-cause mortality rate of people in the lowest socioeconomic group was 652 per 100,000 population, compared with 604 in the second group, 542 in the third, 497 in the fourth, and 449 in the highest socioeconomic group—people in the lowest socioeconomic group were 1.5 times as likely to die from all causes (Figure 5.1.3). Mortality data for 2016 by socioeconomic area were not available at the time of writing.

Disease-specific death rates were generally higher for people in the lowest socioeconomic group, compared with people in the highest group. In particular, they were:

- 2.2 times as likely to die from chronic obstructive pulmonary disease in 2011–15
- 2.1 times as likely to die from potentially avoidable causes in 2015—this being a premature death that could have been avoided with timely and effective health care
- 1.8 times as likely to die from lung cancer in 2011–15
- 1.2 times as likely to die from cerebrovascular disease (mostly stroke) in 2011–15
- likely to die at a similar rate (1.0 times) from dementia and Alzheimer disease in 2011–15.

Figure 5.1.3: All-cause mortality rate, by socioeconomic group, 2015



Source: National Mortality Database; Table S5.1.3.

## Burden of disease

Burden of disease analysis combines estimates of the fatal and non-fatal impact of disease (see Chapter 4.4 'Contribution of selected risk factors to burden of disease').

Compared with people in the highest socioeconomic group, people in the lowest socioeconomic group experienced burden of disease that was estimated to be:

- 1.5 times as high for all causes in 2011 (Figure 5.1.4)
- 2.3 times as high for diabetes in 2011
- 2.0 times as high for lung cancer in 2011
- 1.8 times as high for anxiety disorders in 2011
- 1.4 times as high for stroke in 2011
- similar (1.0 times) for dementia in 2011.

In terms of population impact, if all Australians had experienced the same burden as people in the highest socioeconomic group in 2011, the total disease burden could have been reduced by one-fifth (21%).

### What is missing from the picture?

Monitoring the health gaps between socioeconomic groups is ongoing. Most data collections in Australia do not include information to measure individual socioeconomic position, leading to a reliance on area-based measures. Statistical linkage of health and welfare data sets could provide added information on wealth, education, employment and other social determinants. This would enable more accurate assessments of socioeconomic position and help to better understand the relationships patient outcomes and pathways through the health system for individuals in different socioeconomic groups.

### Where do I go for more information?

Many reports from the AIHW include analysis of health indicators based on socioeconomic position (for example, *Australian Burden of Disease Study: impact and causes of illness and death in Australia 2011*).

For more information about disadvantage and social inequalities, see the AIHW report *Australia's welfare 2017*.

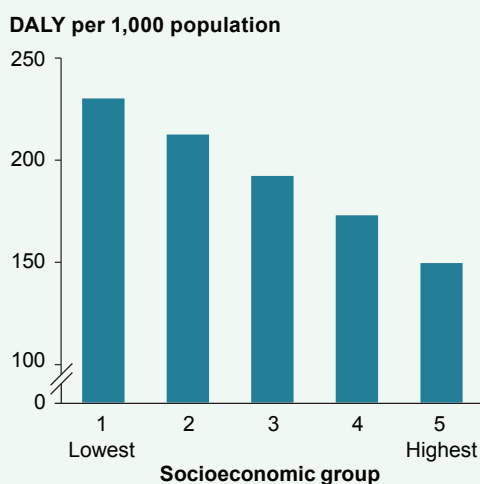
### References

ABS (Australian Bureau of Statistics) 2013. Census of population and housing: Socio-Economic Indexes for Areas (SEIFA), Australia, 2011. ABS cat. no. 2033.0.55.001. Canberra: ABS.

ABS 2015. National Health Survey: first results, 2014–15. ABS cat. no. 4364.0.55.001. Canberra: ABS.

Mackenbach JP 2015. Socioeconomic inequalities in health in high-income countries: the facts and the options. In: Detels R, Gulliford M, Karim QA & Tan CC (eds). Oxford textbook of global public health. Vol. 1. 6th edn. Oxford: Oxford University Press.

Figure 5.1.4: Total burden of disease, by socioeconomic group, 2011



DALY = Disability-adjusted life year.

Source: Table S5.1.4.

## 5.2 Rural and remote populations

Around 7 million people—about 29% of the population—live in rural and remote areas (ABS 2017e). These Australians face unique challenges due to their geographic isolation, and they often have poorer health and welfare outcomes than people living in major cities. The proportion of adults engaging in behaviours associated with poorer health—such as tobacco smoking and excessive alcohol consumption—is higher in rural and remote areas than in metropolitan areas, as is (generally) the prevalence of chronic conditions. These poorer health outcomes may be due to factors such as disadvantage in education, employment opportunities, income and access to services.

Despite poorer health outcomes for some, the Household, Income and Labour Dynamics in Australia Survey found that Australians living in small towns (of fewer than 1,000 people) and in non-urban areas generally experienced higher levels of life satisfaction than those living in major cities (Wilkins 2015).

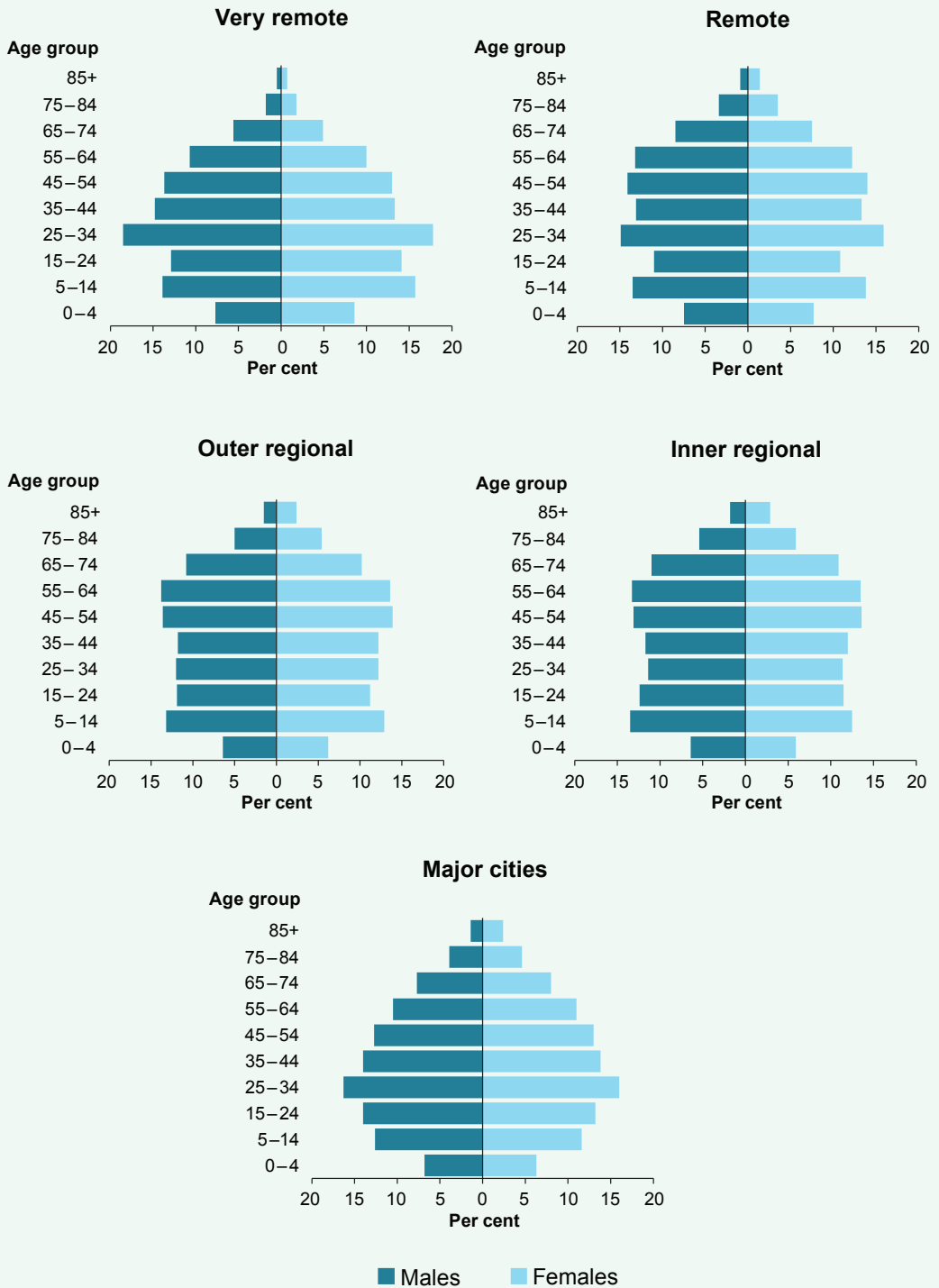
This article presents information to help assess the health of rural and remote populations. The term ‘rural and remote’ covers all areas outside Australia’s major cities, classified by the Australian Statistical Geography Standard as *Inner regional*, *Outer regional*, *Remote* or *Very remote* (ABS 2014). Due to small population sizes, data for *Outer regional*, *Remote* and *Very remote* areas are sometimes combined for reporting purposes.

### Profile of rural and remote Australians

In 2016, the age and sex distribution of Australians varied with remoteness. More than half (51%) of the population in *Major cities* were female compared with 46% in *Very remote* areas. People living in *Remote* and *Very remote* areas were relatively younger than people living in more populated areas. The proportion of males aged 14 and under was 19% in *Major cities* and 22% in *Very remote* areas. The proportion of females aged 14 and under was 18% in *Major cities* and 24% in *Very remote* areas (Figure 5.2.1).






Comparatively, 13% of males in *Major cities* were aged 65 and over, compared with 18% in *Inner regional* areas and 17% in *Outer regional* areas. The proportion of females aged 65 and over was 15% in *Major cities*, compared with 20% in *Inner regional* areas and 18% in *Outer regional* areas.

Figure 5.2.1: Australian population, by age group, sex and remoteness area, 2016



Source: ABS 2017d; Table S5.2.1.

The geographical distribution of Aboriginal and Torres Strait Islander people and non-Indigenous Australians also varied by remoteness area. In 2011, a greater proportion of the Indigenous population lived in rural and remote areas compared with non-Indigenous Australians:

	 <b>Major cities</b>	 <b>Inner regional</b>	 <b>Outer regional</b>	 <b>Remote</b>	 <b>Very remote</b>
Indigenous	35%	22%	22%	7.7%	14%
Non-Indigenous	71%	18%	8.7%	1.2%	0.5%

Source: ABS 2013.

See Chapter 6 for information on Indigenous health by remoteness area.

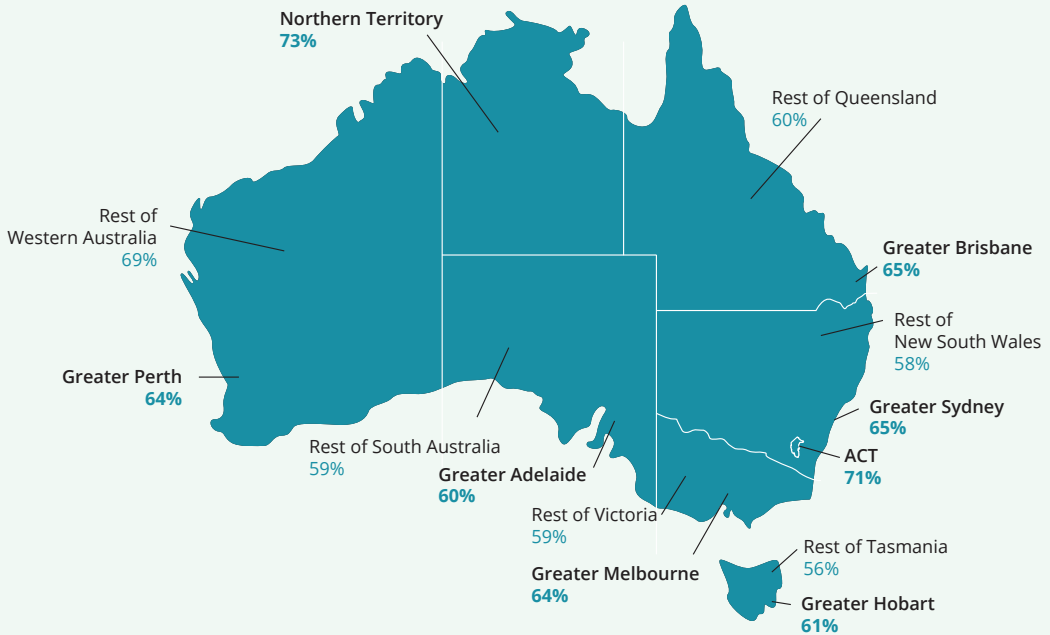
In 2017, the proportion of people with a Bachelor degree or above also varied by remoteness area:

- 36% in *Major cities*
- 19% in *Inner regional* areas
- 18% in *Outer regional* areas
- 18% in *Remote* and *Very remote* areas (ABS 2017a).

As at December 2017, the employment-to-population ratio across Australia was 63%. Except for Greater Perth, greater metropolitan areas had a higher proportion of employed people than did the rest of their respective state or territory (Figure 5.2.2). This may be due to lower levels of access to work outside *Major cities* and to the higher number of retired older people living in these areas (ABS 2008; NRHA 2013).

See Chapter 4 for more information on the social determinants of health.

Figure 5.2.2: Employment-to-population ratio, by greater metropolitan areas and the rest of states and territories, 2017






## Health status

Behaviours associated with poorer health, the rate of chronic conditions as well as disease burden can be assessed across remoteness areas.

## Risk factors

Taking into account the different age structure of people living in the different remoteness areas, people living in rural and remote areas are more likely to have higher rates of health risk factors. Compared with people in *Major cities*, people in *Outer regional/Remote* areas had higher rates of daily smoking, risky alcohol consumption, physical inactivity and overweight and obesity in 2014–15:

	 Major cities	 Inner regional	 Outer regional/ Remote
Current daily smoker	13%	18%	22%
Overweight or obese	61%	67%	68%
No/low exercise level	64%	69%	72%
Exceeded lifetime alcohol risk guideline	16%	18%	24%
High blood pressure	22%	24%	22%




*Notes*

1. The symbol '%' represents the prevalence of the risk factor in each region (excluding *Very remote* areas of Australia).
2. Proportions were age standardised to the 2001 Australian Standard Population.

Source: ABS 2016; Table S5.2.3.

## Chronic conditions

Taking into account the different age structure of people living in the different remoteness areas, self-reported rates of selected chronic conditions were similar for people living in *Major cities*, *Inner regional* and *Outer regional/Remote* areas in 2014–15, with the exception of heart, stroke and vascular disease rates being higher in *Inner regional* areas compared to *Major cities*:

	 Major cities	 Inner regional	 Outer regional/ Remote
Asthma	10%	12%	12%
Osteoarthritis	7.7%	9.1%	9.3%
Back pain and problems	16%	16%	16%
Diabetes	5.8%	6.6%	7.3%
Heart, stroke and vascular disease	21%	25%	22%

*Notes*

1. The symbol '%' represents the prevalence of chronic conditions in each region (excluding *Very remote* areas of Australia).
2. Proportions were age standardised to the 2001 Australian Standard Population.

Source: ABS 2016; Table S5.2.4.

## Disease burden

Burden of disease analyses reveal health inequalities between rural and remote communities and *Major cities*. Burden of disease—expressed as disability-adjusted life years (DALYs)—is a measure of the health impact of disease on a population in a given year: both from dying, and living with, disease and injury (AIHW 2016a).

People living in *Very remote* areas experienced the highest total burden per population (301 DALY per 1,000 population), and people in *Major cities* the lowest (181). The rate for *Very remote* areas was 1.7 times the rate for *Major cities* (Table 5.2.1).

**Table 5.2.1: DALY rate and rate ratio, by remoteness area, 2011**

	Major cities	Inner regional	Outer regional	Remote	Very remote
Age-standardised rate (number per 1,000 population)	181.4	205.3	206.8	242.0	300.8
Rate ratio	1.0	1.1	1.1	1.3	1.7

### Notes

1. Rates were age standardised to the 2001 Australian Standard Population.
2. Rate ratios compare the rate of burden for remoteness areas with that for *Major cities*.

Source: AIHW 2016a.

For most disease groups, age-standardised rates of disease burden increased with remoteness and were highest in *Very remote* areas. The greatest absolute difference in DALY rates of burden between *Major cities* and *Very remote* areas was for injuries (15 and 44 DALY per 1,000 population, respectively). The greatest relative difference in DALY rates of burden was for kidney and urinary diseases, with *Very remote* areas having more than 6.0 times the rate of *Major cities*; this was followed by endocrine disorders (3.2 times) and injuries (3.0 times). For a full breakdown of DALY rates of disease groups, see AIHW 2016a and Supplementary Table S5.2.5.

See Chapter 3.1 'Burden of disease across the life stages' for more information on burden of disease.

## Deaths

In 2015, age-standardised overall mortality rates increased as remoteness increased, with people living in *Very remote* areas having a mortality rate almost 1.4 times as high as people living in *Major cities* (759 per 100,000 population compared with 524 per 100,000 population) (Table 5.2.2). Mortality data for 2016 by remoteness area were not available at the time of writing.



**Table 5.2.2: Median age at death, mortality rate and rate ratio, by remoteness area, 2015**

	Major cities	Inner regional	Outer regional	Remote	Very remote
Median age at death (years)	82.0	81.0	79.0	76.0	67.0
Age-standardised rate (number per 100,000 population)	524.3	593.0	611.4	657.4	759.3
Rate ratio	1.0	1.1	1.2	1.3	1.4

*Notes*

1. Rates were age standardised to the 2001 Australian Standard Population.
2. Rate ratios compare the remoteness area rate with the *Major cities* rate.

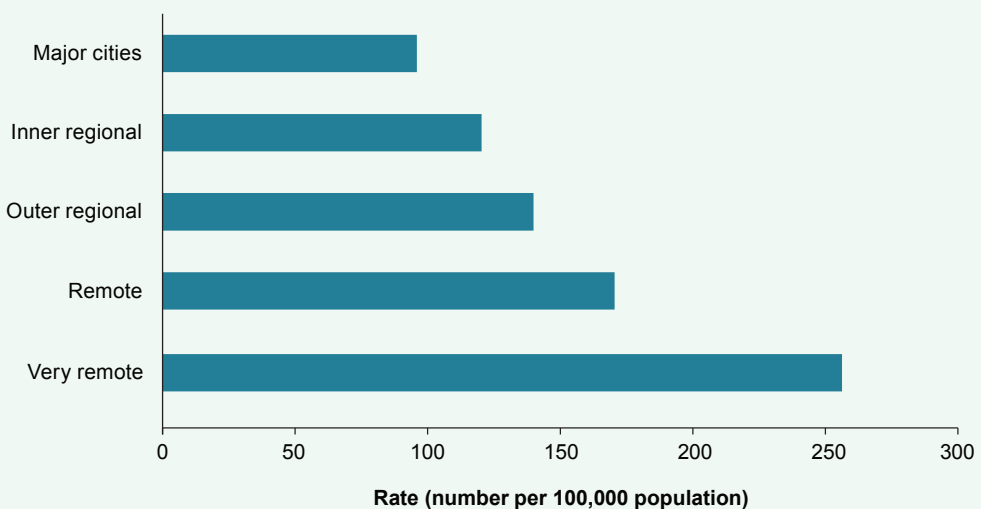
Source: AIHW 2017b.

## Potentially avoidable deaths

Potentially avoidable deaths are deaths among people aged under 75 that are considered potentially preventable either by having individualised care or by being treated through existing primary or hospital care. In 2015, age-standardised potentially avoidable death rates increased as remoteness increased, with people living in *Very remote* areas having a death rate over 2.5 times as high as people living in *Major cities* (256 per 100,000 population compared with 96 per 100,000 population) (Figure 5.2.3).

**Figure 5.2.3: Age-standardised potentially avoidable death rate, by remoteness area, 2015**

**Remoteness area**



Source: AIHW 2017b; Table S5.2.6.

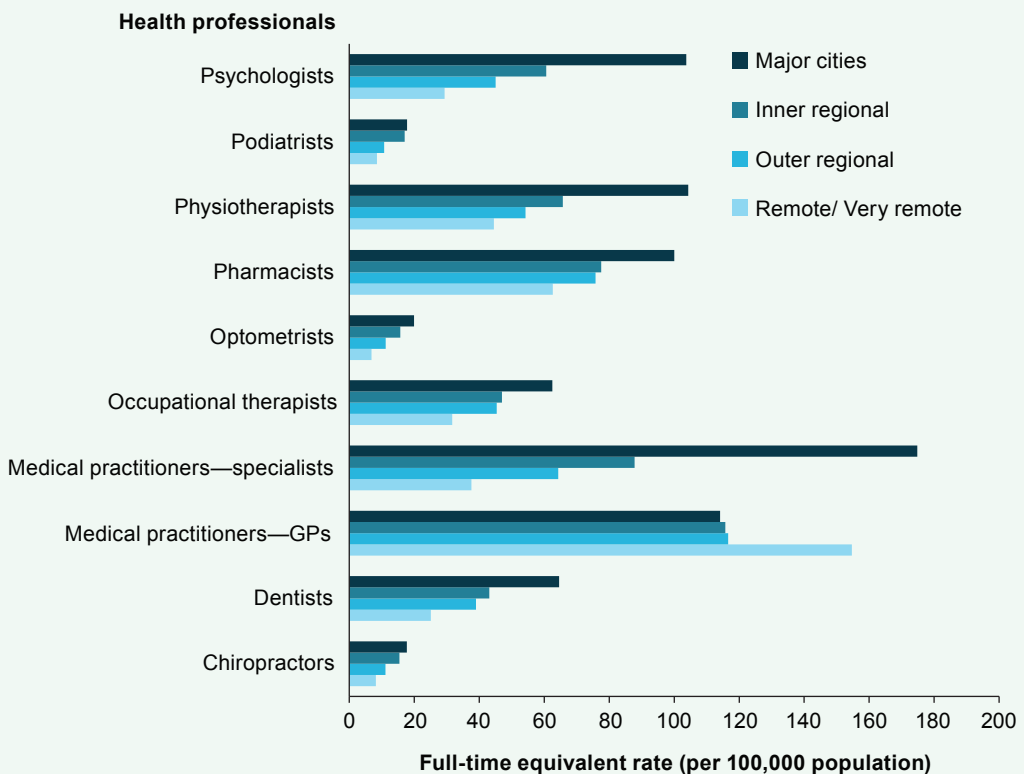
# Access to health care

The challenges of geographic spread, low population density, limited infrastructure, as well as the higher costs of delivering rural and remote health care, can affect access to health care.

## Health workforce

Except for general practitioners (GPs), there is a marked decline in the full-time equivalent rate (based on total weekly hours worked) of most types of health care professionals per 100,000 population as remoteness increases (Figure 5.2.4). The higher rate of GPs in *Remote/Very remote* areas may be due to them having a broader scope of practice, given lower levels of supply for almost all other health professionals.

**Figure 5.2.4: Employed health professionals, full-time equivalent rate, by remoteness area, 2016**



Source: National Health Workforce Data Set; Table S5.2.7.

See Chapter 2.3 'Who is in the health workforce?' for more information on health workforce supply.

## Primary health care

Primary health care covers a large range of providers and services across health care sectors. Primary health care is the entry level to the health system and, as such, is usually a person's first encounter with the system (AIHW 2016b).

Based on self-reported data, there was little variation in the proportion of people visiting a GP across remoteness areas (Table 5.2.3). However, people living outside *Major cities* were less likely to have visited a dental professional or an after-hours GP.

The relative lack outside *Major cities* of specialists and primary care professionals who were not GPs may help to explain why people living in these areas were more likely to have visited a hospital emergency department in the last 12 months (18% in *Outer regional/Remote/Very remote* areas, 16% in *Inner regional* areas, and 13% in *Major cities*).

**Table 5.2.3: Experience of health services in the last 12 months (per cent), by remoteness area, people aged 15 and over, 2016–17**

Health care service	Major cities	Inner regional	Outer regional/ Remote/ Very remote
Saw a GP	82.4	83.8	81.5
Saw a GP for urgent medical attention	8.9	9.8	10.8
Saw an after-hours GP	9.3	6.6	5.8
Received a prescription for medication from a GP	67.4	71.3	69.5
Saw a dental professional	50.0	44.6	41.3
Saw a medical specialist	36.3	36.4	33.6
Visited a hospital emergency department	12.7	15.8	17.9

Source: ABS 2017c; Table S5.2.8.

See Chapter 7 for more information on health service statistics.

### Experiences with GP care vary by remoteness. In 2016–17:



**21%** of people in *Outer regional/Remote/Very Remote* areas waited longer than they felt was acceptable to get an appointment with a GP (compared with 19% in *Inner regional* areas and 18% in *Major cities*)



**33%** of people in *Outer regional/Remote/Very Remote* areas reported they could not see their preferred GP on one or more occasions (compared with 28% in *Inner regional* areas and 25% in *Major cities*)



**11%** of people in *Outer regional/Remote/Very Remote* areas reported their GP sometimes, rarely or never spent enough time with them (compared with 8.9% in *Inner regional* areas and 9.3% in *Major cities*)



**4.8%** of people in *Inner regional* areas reported that they at least once delayed seeing, or did not see, a GP when they needed to because of cost (compared with 4.6% in *Outer regional/Remote/Very Remote* areas and 3.9% in *Major cities*) (ABS 2017c).

In a study of rural and remote health conducted by the Royal Flying Doctor Service of Australia (RFDS), survey respondents in rural and remote areas reported spending an average of 1 hour travelling to see a doctor for a non-emergency reason: some travelled as long as 5 or more hours. For urgent medical care, the majority of survey respondents were able to access a doctor within 4 hours, although some waited up to 6 days or longer (Bishop et al. 2017). See Chapter 7.5 'Primary health care' for more information on primary health care.

## Potentially preventable hospitalisations

A potentially preventable hospitalisation (PPH) is an admission to hospital that could potentially have been prevented had there been appropriate individualised preventative health care or early disease management—usually delivered in primary care and community-based care settings (AIHW 2017a).

In 2015–16, the overall rate of PPHs was highest for residents of *Remote* and *Very remote* areas (40 and 61 per 1,000 population, respectively), and lowest for residents of *Major cities* (25 per 1,000 population). Residents of *Remote* and *Very remote* areas had the highest rates of PPHs across all PPH categories (vaccine preventable conditions, acute conditions, and total chronic conditions) (Table 5.2.4). However, there is variation from community to community, both inside and outside *Major cities* (NHPA 2015).

**Table 5.2.4: PPH rate (hospitalisations per 1,000 population), by selected PPH and remoteness area<sup>(a)(b)(c)</sup>, 2015–16**

Type of PPH	Major cities	Inner regional	Outer regional	Remote	Very remote
Vaccine preventable conditions	2.1	1.4	1.5	3.1	9.0
Acute conditions	11.7	13.3	15.1	20.4	30.1
<i>Total chronic conditions</i> <sup>(d)</sup>	11.4	12.5	13.4	16.6	23.7
Diabetes complications	1.7	2.0	2.2	2.8	4.6
Chronic conditions (excluding diabetes)	9.7	10.5	11.3	13.9	19.1
<b>Total</b>	<b>25.0</b>	<b>27.0</b>	<b>29.9</b>	<b>39.5</b>	<b>60.9</b>

(a) Data are presented by the remoteness area in which the patient usually lives, rather than the hospital.

(b) Includes public and private hospitals.

(c) PPH rates are directly age standardised using populations by remoteness areas, which do not include persons with unknown or migratory area of usual residence.

(d) As more than one chronic condition may be reported for a separation, the sum of Diabetes complications and Chronic conditions (excluding diabetes) does not necessarily equal the total number of separations for Chronic conditions.

Source: AIHW 2017a.

## Hospitalisations

Low levels of access to primary health care can mean that people from rural and remote areas present to a hospital with conditions that could have been treated by a primary health care practitioner and, instead, seek help later in the course of a disease (Duckett et al. 2013).

In 2015–16, the total number of hospitalisations per 1,000 population varied by remoteness area. Rates were highest for people living in *Very remote* areas (746 per 1,000 population) (Table 5.2.5). This was 1.8 times the rate of *Major cities*.

**Table 5.2.5: Hospitalisation rate, by remoteness area<sup>(a)(b)</sup>, 2015–16**

Hospitalisations	Major cities	Inner regional	Outer regional	Remote	Very remote
Hospitalisations per 1,000 population <sup>(c)</sup>	409.6	415.5	415.4	479.4	745.8
Hospitalisation rate ratio <sup>(d)</sup>	1.0	1.0	1.0	1.2	1.8

(a) Data are presented by the remoteness area in which the patient usually lives, rather than the hospital.

(b) Includes public and private hospitals.

(c) Hospitalisation rates are directly age standardised using populations by remoteness areas, which do not include persons with unknown or migratory area of usual residence.

(d) The hospitalisation rate ratio is equal to the hospitalisation rate for regional/remote areas divided by the hospitalisation rate for *Major cities*.

Source: AIHW 2017a.

See Chapter 7 for more information on hospital care.

## Targeted health care

Specialist outreach in rural and remote areas can improve early intervention and the coordination of care, as well as reducing the rate of hospitalisations.

The RFDS provides 24-hour emergency care to people in rural and remote Australia. Health care professionals, including doctors, nurses, mental health workers and dentists, deliver care. In 2016–17, the RFDS made around 336,000 total patient contacts, transported around 107,000 patients, conducted around 88,500 telehealth consultations and provided around 10,800 episodes of dental care (RFDS 2017).

### What is missing from the picture?

It can be difficult to assess the implications of remoteness to health due to gaps in the availability and coverage of health data in rural and remote areas—and in information available at the local area level. For example, the Australian Bureau of Statistics National Health Survey does not include *Very remote* areas of Australia.

### Where do I go for more information?

More information on rural and remote health is available on the AIHW website <[www.aihw.gov.au/reports/rural-health/rural-remote-health/contents/rural-health](http://www.aihw.gov.au/reports/rural-health/rural-remote-health/contents/rural-health)>. This web report and other recent releases are available for free download.

## References

- ABS (Australian Bureau of Statistics) 2008. Australian social trends, 2008. ABS cat. no. 4102.0. Canberra: ABS.
- ABS 2013. Estimates of Aboriginal and Torres Strait Islander Australians, June 2011. ABS cat. no. 3238.0.55.001. Canberra: ABS.
- ABS 2014. Remoteness structure. Canberra: ABS. Viewed 22 January 2018, <<http://www.abs.gov.au/websitedbs/D3310114.nsf/home/remoteness+structure>>.
- ABS 2016. Microdata: National Health Survey, 2014–15. ABS cat. no. 4324.0.55.001. Canberra: ABS. AIHW analysis of Expanded Confidentialised Unit Record File.
- ABS 2017a. Education and work, Australia, May 2017. ABS cat. no. 6227.0. Canberra: ABS.
- ABS 2017b. Labour force, Australia, detailed—electronic delivery, Dec. 2017. ABS cat. no. 6291.0.55.001. Canberra: ABS.
- ABS 2017c. Patient experiences in Australia: summary of findings, 2016–17. ABS cat. no. 4839.0 Canberra: ABS.
- ABS 2017d. Population by age and sex, regions of Australia, 2016. ABS cat. no. 3235.0. Canberra: ABS. Derived by AIHW from SA1 estimated resident populations.
- ABS 2017e. Regional population growth, Australia, 2016. ABS cat. no. 3218.0 Canberra: ABS.
- AIHW (Australian Institute of Health and Welfare) 2016a. Australian Burden of Disease Study: impact and causes of illness and death in Australia 2011. Australian Burden of Disease Study series no. 3. BOD 4. Canberra: AIHW.
- AIHW 2016b. Primary health care in Australia. Canberra: AIHW. Viewed 11 December 2017, <<https://www.aihw.gov.au/reports/primary-health-care/primary-health-care-in-australia/contents/about-primary-health-care>>.
- AIHW 2017a. Admitted patient care 2015–16: Australian hospital statistics. Health services series no. 75. Cat. no. HSE 185. Canberra: AIHW.
- AIHW 2017b. MORT (Mortality Over Regions and Time) books: remoteness area, 2011–2015. Canberra: AIHW.
- Bishop L, Ransom A & Laverty M 2017. Health care access, mental health, and preventive health: health priority survey findings for people in the bush. Canberra: Royal Flying Doctor Service of Australia.
- Duckett S, Breadon P & Ginnivan L 2013. Access all areas: new solutions for GP shortages in rural Australia. Melbourne: Grattan Institute.
- NHPA (National Health Performance Authority) 2015. Healthy communities: potentially preventable hospitalisations in 2013–14. Sydney: Australia.
- NRHA (National Rural Health Alliance) 2013. A snapshot of poverty in rural and regional Australia. Canberra: NRHA.
- RFDS (Royal Flying Doctor Service) 2017. Annual national report 2016/17. Canberra: RFDS.
- Wilkins R 2015. The Household, Income and Labour Dynamics in Australia Survey: selected findings from waves 1 to 12. Melbourne: Melbourne Institute of Applied Economic and Social Research.

## 5.3 Culturally and linguistically diverse populations

Australia's population includes many people who were born overseas, have a parent born overseas or speak a variety of languages. Together, these groups of people are known as culturally and linguistically diverse (CALD) populations. The Australian Bureau of Statistics (ABS) defines the CALD population mainly by country of birth, language spoken at home, English proficiency, or other characteristics (including year of arrival in Australia), parents' country of birth and religious affiliation (ABS 1999). Country of birth is the most common data element among AIHW health data collections (in 12 data collections, see Supplementary Table S5.3.4) and is used in this snapshot.

According to the 2016 Census of Population and Housing, almost half of Australians (45% or 10.6 million) were either born overseas (26% or 6.2 million) or had one or both parents who were born overseas (19% or 4.5 million) (ABS 2017a).

In 2016, the most common overseas countries of birth were:



England  
3.9% (908,000)



New Zealand  
2.2% (518,000)



China  
2.2% (510,000)



India  
1.9% (455,000)

Source: ABS 2017a.

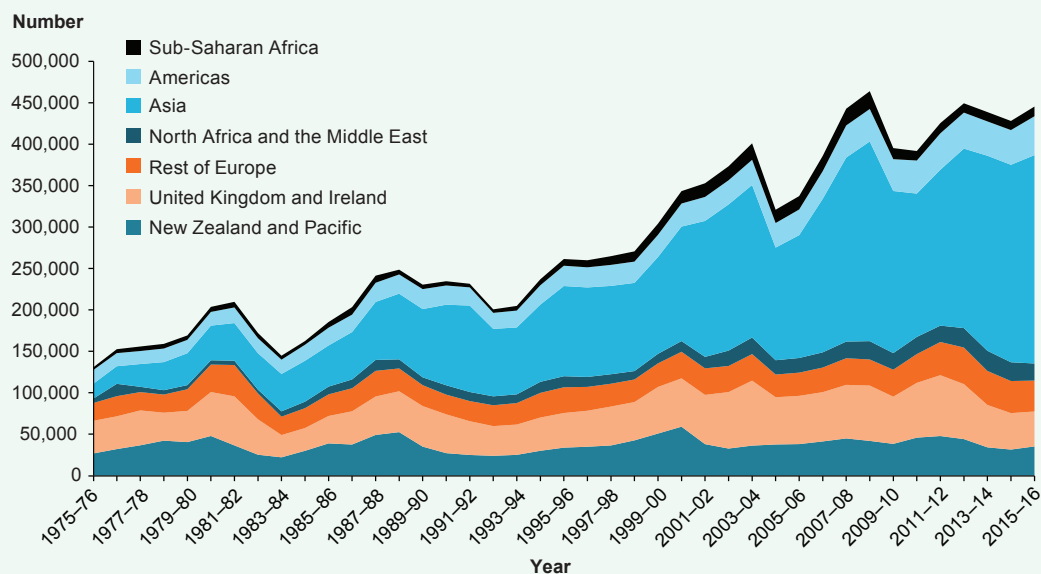
Over 300 languages are spoken in Australia:

- 1 in 5 (21%) people speak a non-English language at home
- English is not the first language for 15% or 3.5 million people
- English is not spoken at home for 0.5% or 117,000 people.

Sources: ABS 2017a, 2017b.

Migration patterns have varied over time, both in the number of migrants and the country or region where people previously lived. After World War II, there was an increase in European (non-United Kingdom) migrants coming to Australia (Hugo 2004); from the mid-70s, the number of migrants from Asia began to increase. This growth in migrants from Asia has continued over the last four decades. Over the same period, the majority of European migrants arriving in Australia previously resided in the UK and Ireland (Figure 5.3.1).

Figure 5.3.1: Migrant arrival to Australia, by region of last residence, 1975–76 to 2015–16



Sources: ABS 2017c, 2018; Table S5.3.1.

## Health differentials

Nearly one-quarter of Australians are first-generation immigrants and they make up a large section of Australia's CALD population. Research in several countries with high immigrant populations, including Australia, has found that migrant populations are often healthier than native-born populations (Kennedy et al. 2014). Compared with the Australian-born population, some immigrants have been found to have lower mortality rates and self-reported chronic conditions (Jatrana et al. 2014; Kennedy et al. 2007). For example, immigrants from Africa, the Middle East and India reported to have fewer chronic conditions compared with Australian-born individuals. This pattern is known as the 'healthy migrant effect'. It is often explained by the health screenings that host countries require before people migrate, and immigrants having a higher health and wealth status to be able to physically and financially migrate to another country (Kennedy et al. 2014).

This healthy migrant effect can disappear after immigrants have lived in Australia for a long time (Jatrana et al. 2017). A longitudinal study found that when immigrant groups from non-English speaking countries had been in Australia for more than 10 years, their mental health and self-assessed health were worse than that for Australian-born individuals (Jatrana et al. 2017).

Conversely, immigrants from English-speaking countries were found to have advantages related to physical health, mental health and self-assessed health. English proficiency had an effect on the difference in health between populations, as a language barrier could hinder an individual's access to health services. It can also have an impact on employment, which has broader socioeconomic implications.

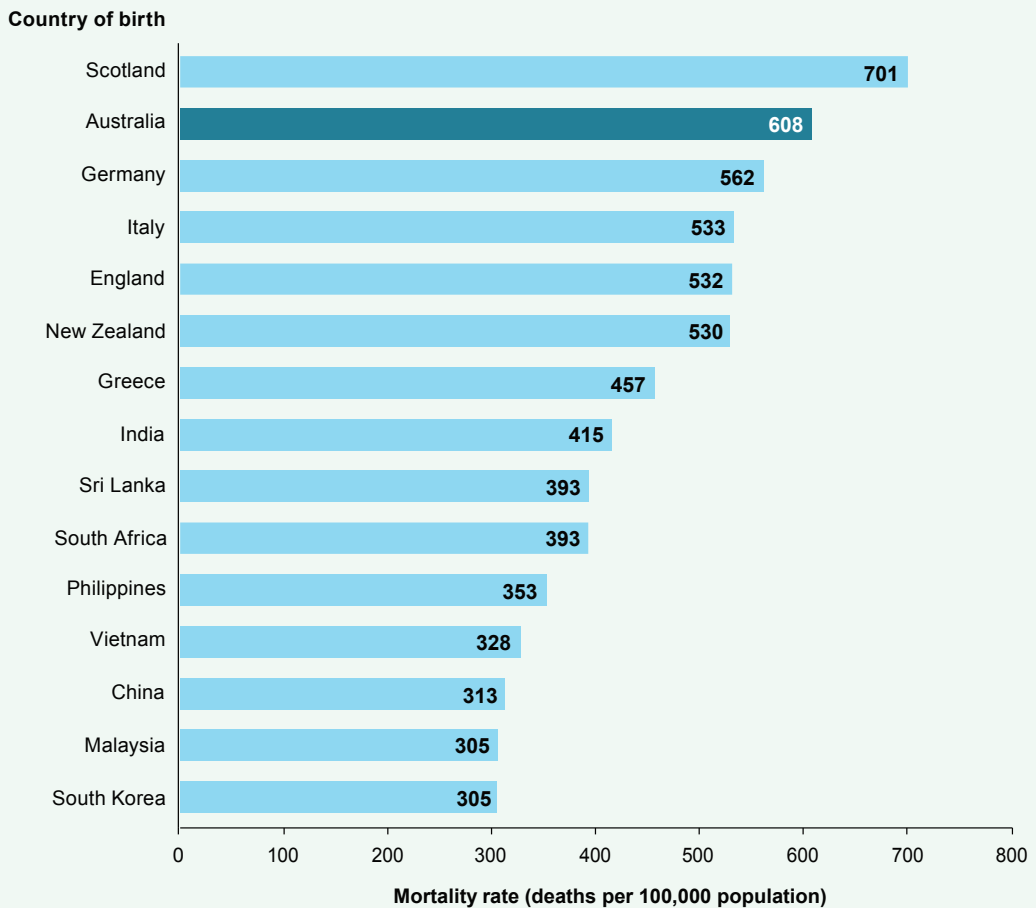


## Mortality

Figure 5.3.2 shows age-standardised mortality rates (for any cause of death) among the most common countries of birth reported in the 2016 Census. Consistent with the healthy migrant effect, people born in some Asian countries had the lowest rates of mortality due to any cause (including South Korea, Malaysia and China). Scottish-born people had the highest all-cause mortality rates (701 per 100,000 population), which was higher than Australian-born people (608 per 100,000).

While the all-cause mortality rates in Figure 5.3.2 show the healthy migrant effect, after looking at cause-specific mortality (Supplementary Table S5.3.2), this effect does not seem to apply across the board for all CALD populations, as the populations are not homogeneous. For example, people born in the Philippines had the highest mortality rate due to cerebrovascular disease (42 per 100,000 population) but had the third lowest mortality rate due to chronic obstructive pulmonary disorder (COPD) (4.8 per 100,000).

**Figure 5.3.2: Age-standardised all-cause mortality rate, by country of birth, 2016**



Source: National Mortality Database; Table S5.3.2.

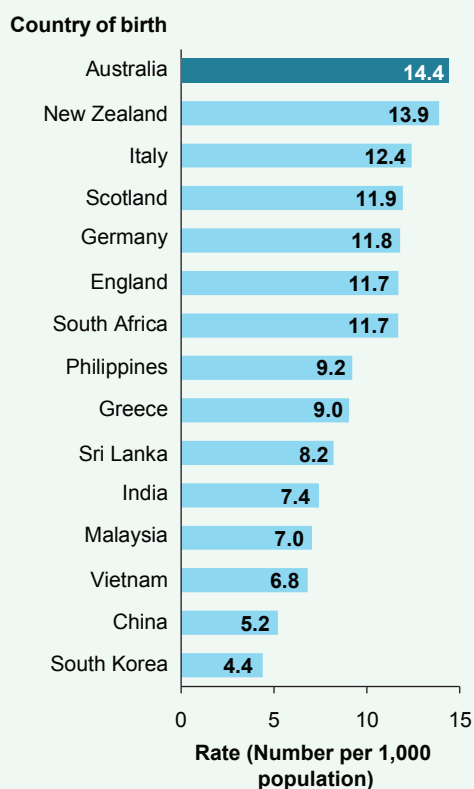
## Potentially preventable hospitalisations

Potentially preventable hospitalisations (PPHs) allow for an examination of hospitalisations that could be considered to be largely preventable if timely and adequate care were provided through population health services, primary care and outpatient services. High rates of PPHs can indicate decreased access to primary care or continuing care support (AHMAC 2017).

Figures 5.3.3 and 5.3.4 both show similar patterns among all PPHs and PPHs due to chronic conditions, for the most common countries of birth reported in the 2016 Census. Compared with Australian-born people, people born in Asian countries had lower age-standardised rates of PPHs (4.4 per 1,000 population among South Korean-born, and 5.2 per 1,000 among Chinese-born). Individuals born in Australia and New Zealand had the highest PPH rates (14.4 and 13.9 per 1,000 population, respectively). People born in Italy, Scotland and Germany also had higher rates.

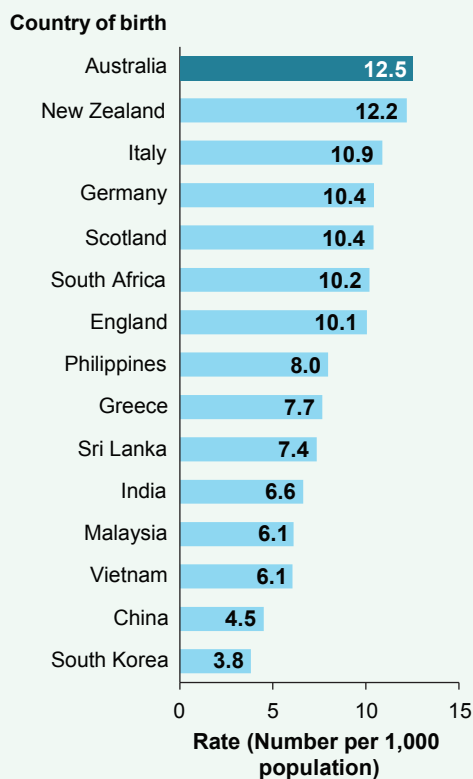
Among Italian- and Greek-born people, among PPHs due to chronic conditions, the most common conditions were congestive cardiac failure (CCF) and COPD. Among Chinese- and Vietnamese-born people, PPHs were most common for anaemia and CCF (Figure 5.3.4).

**Figure 5.3.3: Age-standardised PPH rate, by country of birth, 2015–16**



Sources: National Hospital Morbidity Database; Table S5.3.3.

**Figure 5.3.4: Age-standardised PPH rate for chronic conditions, by country of birth, 2015–16**



Sources: National Hospital Morbidity Database; Table S5.3.3.

## Refugee health

For immigrants from some countries—especially refugees—migration can be a source of trauma, and refugees have been found to have high rates of mental health problems (FECCA 2015; Schweitzer et al. 2011; Shawyer et al. 2017; Sheikh-Mohammed et al. 2006; Steel et al. 2009). Refugees in Melbourne were found to be 3.1 times more likely to have a mental disorder and twice as likely to have post-traumatic stress disorder (PTSD) compared with Australian-born individuals (Shawyer et al. 2017). Rates of PTSD, depression, and anxiety were 3–4 times higher among Tamil asylum seekers than other immigrants (Minas et al. 2013). As well, Iraqi and sub-Saharan African refugees in Australia were found to have lower levels of mental health literacy compared with the general Australian population, indicating that targeted mental health promotion would benefit these refugee populations (Sheikh-Mohammed et al. 2006; Slewa-Younan et al. 2014).

The refugee subsection of the CALD population is particularly vulnerable. Being able to identify and understand the specific needs of refugees is essential to improving their health status in Australia. States and territories have refugee health networks, and most have programs that include a focus on mental health service. Programs include screening, assisting survivors of torture and trauma, delivering community health outreach for newly settled refugees, and providing an initial point of contact to the health system.

### What is missing from the picture?

The ABS has a set of Standards for Statistics on Cultural and Language Diversity that includes a Minimum Core Set of Cultural and Language Indicators: country of birth, main language other than English spoken at home, and proficiency in English. While these standards exist, their use in national health data collections could be improved to better understand diverse CALD populations and identify their specific needs. As well, it would be useful to have more information related to how long individuals have been in Australia, language use patterns, their need for an interpreter, parents' country of birth, and refugee status.

Language barriers can lead to an under-representation of CALD people where English is used in surveys or is required for self-reported information.

### Where do I go for more information?

The online report *Older Australia at a glance* touches on older CALD people, and an evaluation of CALD measures in a variety of data sets and assessment instruments can be found in the report *Cultural and linguistic diversity measures in aged care*.



## References

- ABS (Australian Bureau of Statistics) 1999. Standards for Statistics on Cultural and Language Diversity. ABS cat. no. 1289.0. Canberra: ABS.
- ABS 2017a. Census of Population and Housing: cultural diversity data cube. ABS cat. no. 2071.0. Canberra: ABS.
- ABS 2017b. Census reveals a fast changing, culturally diverse nation. Canberra: ABS. Viewed 3 November 2017, <<http://www.abs.gov.au/ausstats/abs@.nsf/lookup/Media%20Release3>>.
- ABS 2017c. Migration, Australia, 2015–16. ABS cat. no. 3412.0. Canberra: ABS. Customised report.
- ABS 2018. Overseas Arrivals and Departures, Australia, Feb 2018. ABS cat. no. 3401.0. Canberra: ABS. Customised report.
- AHMAC (Australian Health Ministers' Advisory Council) 2017. Aboriginal and Torres Strait Islander Health Performance Framework 2017 report. Canberra: AHMAC.
- FECCA (Federation of Ethnic Communities' Councils of Australia) 2015. Review of Australian research on older people from culturally and linguistically diverse backgrounds. Canberra: FECCA.
- Hugo, G 2004. A new paradigm of international migration: implications for migration policy and planning in Australia. Canberra: Department of Parliamentary Services. Viewed 30 April 2018, <[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/pubs/rp/rp0304/04rp10](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/rp0304/04rp10)>.
- Jatrana S, Pasupuleti SSR & Richardson K 2014. Nativity, duration of residence and chronic health conditions in Australia: do trends converge towards the native-born population? *Social Science and Medicine* 119:53–63.
- Jatrana S, Richardson K & Samba SRA 2017. Investigating the dynamics of migration and health in Australia: a longitudinal study. *European Journal of Population*. doi:org/10.1007/s10680-017-9439-z.
- Kennedy S, Kidd MP, McDonald JT & Biddle N 2007. The healthy immigrant effect and immigrant selection: evidence from four countries. Program for Research on Social and Economic Dimensions of an Aging Population (SEDAP). Research paper no. 164. Hamilton: SEDAP, McMaster University.
- Kennedy S, Kidd MP, McDonald JT & Biddle N 2014. The healthy immigrant effect: patterns and evidence from four countries. *Journal of International Migration and Integration* 16(2):317–32.
- Minas H, Kakuma R, Too LS, Vayani H, Orapeleng S, Prasad-Ildes R, Turner G, Procter N & Oehm D 2013. Mental health research and evaluation in multicultural Australia: developing a culture of inclusion. *International Journal of Mental Health Systems* 2013:7:23.
- Schweitzer RD, Brough M, Vromans L & Asic-Kobe M 2011. Mental health of newly arrived Burmese refugees in Australia: contributions of pre-migration and post-migration experience. *The Australian and New Zealand Journal of Psychiatry* 45(4):299–307.
- Shawyer F, Enticott JC, Block AA, Cheng I-H & Meadows GN. The mental health status of refugees and asylum seekers attending a refugee health clinic including comparisons with a matched sample of Australian-born residents. *BMC Psychiatry* 17:76.
- Sheikh-Mohammed M, Macintyre CR, Wood NJ, Leask J & Isaacs D. Barriers to access to health care for newly resettled sub-Saharan refugees in Australia. *Medical Journal of Australia* 185(11-12):594-7.
- Slewa-Younan A, Mond J, Bussion E, Mohammed Y, Guajardo MGU, Smith M, Milosevic D, Lujic S & Jorm FA 2014. Mental health literacy of resettled Iraqi refugees in Australia: knowledge about posttraumatic stress disorder and beliefs about helpfulness of interventions. *BMC Psychiatry* 14:320.
- Steel Z, Chey T, Silove D, Marnane C, Bryant RA & van Ommeren M 2009. Association of torture and other potentially traumatic events with mental health outcomes among populations exposed to mass conflict and displacement: a systematic review and meta-analysis. *Journal of the American Medical Association* 302(5):537–49.

## 5.4 People with disability

An estimated 1 in 5 people in Australia (18% or 4.3 million people) had disability in 2015, including about 1.4 million people (5.8% of the population) with severe or profound disability (ABS 2016a) (see Box 5.4.1 for definitions). Disability and health have a complex relationship—long-term health conditions might cause disability, and disability can contribute to health problems. The nature and extent of a person’s disability can also influence their health experiences.

This snapshot looks at the health of people with disability, the risks to their health, and their experiences of health care.

### Box 5.4.1: Defining and measuring disability

There are many different concepts and measures of disability, making comparisons across different data sources challenging. The AIHW promotes measures based on the International Classification of Functioning, Disability and Health (WHO 2001), which underpins the disability categories used here.

The data used in this snapshot are primarily from the Australian Bureau of Statistics (ABS) Survey of Disability, Ageing and Carers (SDAC) 2015 and the National Health Survey (NHS) 2014–15, with supplementary information from the ABS Patient Experience Survey 2015–16 and 2016–17, and the National Disability Insurance Scheme (NDIS) (Box 5.4.2).

To identify disability, the SDAC asks participants if they have at least one of a list of limitations, restrictions or impairments, which has lasted, or is likely to last, for at least 6 months and that restricts everyday activities (ABS 2016a). The NHS asks similar questions but with less detail (ABS 2016d). The Patient Experience Survey does not identify disability, and data from it refer to Australians generally (ABS 2016e, 2017).

This snapshot groups people with disability as people:

- with severe or profound core activity limitation—unable to do, or always or sometimes needs help with, a core activity (self-care, mobility and communication); this is referred to in this snapshot as ‘with severe or profound disability’
- without severe or profound core activity limitation—has a mild or moderate core activity limitation, or has restriction in schooling or employment; this is referred to in this snapshot as ‘with other forms of disability’.

Unlike the SDAC, the NHS does not report on people living in institutional settings, such as aged care facilities (ABS 2016d). To avoid under-representing disability among certain groups, this snapshot therefore focuses on people aged under 65 who live in households.

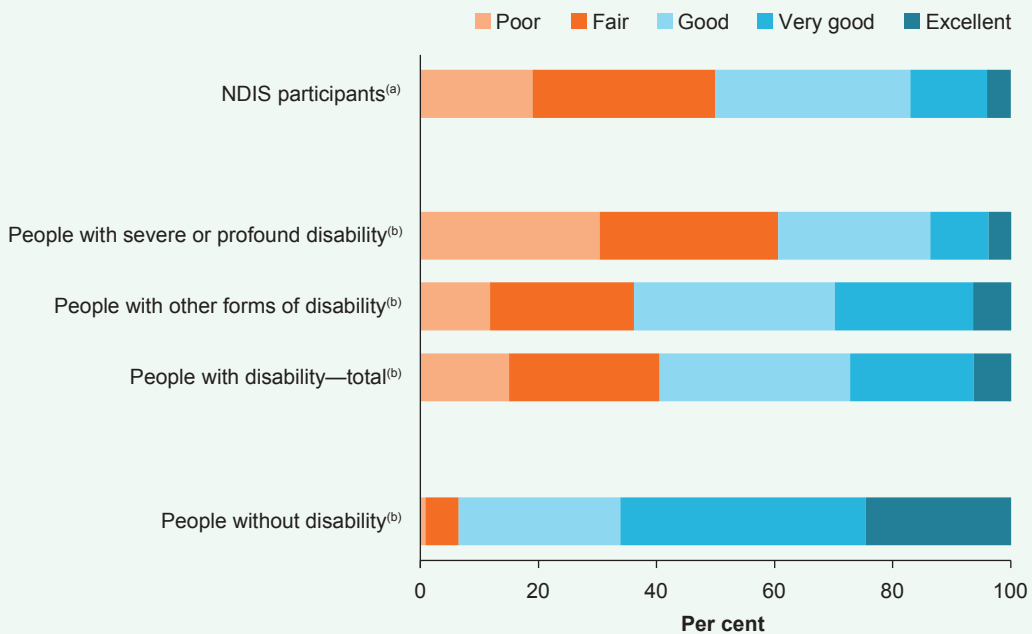


## Health status

People with disability generally rate their health as poorer than other Australians. They were around 6.2 times as likely as people without disability to assess their health as 'poor' or 'fair' in 2014–15 (41% compared with 6.5%) (Figure 5.4.1). This is especially the case for people with severe or profound disability (61%), who were about 10 times as likely as people without disability, and almost twice as likely as people with other forms of disability (36%), to assess their health as 'poor' or 'fair' (Figure 5.4.1).

Participants in the NDIS (Box 5.4.2) also rated their health as poorer than other Australians, with 50% aged 25 and over assessing their health as 'poor' or 'fair' between 1 July 2016 and 30 September 2017 (Figure 5.4.1).

**Figure 5.4.1: Self-assessed health, by broad disability status (2014–15), and for NDIS participants (1 July 2016–30 September 2017)**



(a) NDIS participants aged 25 and over, 1 July 2016–30 September 2017. See also Box 5.4.2.

(b) ABS 2014–15 NHS respondents aged 15–64; includes people who may be NDIS participants.

Sources: ABS 2016c; NDIA unpublished data 1 July 2016–30 September 2017; Tables S5.4.4, S5.4.1.

### **Box 5.4.2: National Disability Insurance Scheme**

The NDIS is a substantial change to how services are delivered to people with disability in Australia. It uses an insurance-based model to provide Australians with ‘permanent and significant’ disability the ‘reasonable and necessary support’ needed to participate in everyday life. The NDIS was introduced through trial sites from 1 July 2013, with the transition to the full scheme occurring progressively from 1 July 2016.

#### **NDIS Outcomes Framework**

The NDIS Outcomes Framework collects information about how participants and their families and carers are faring in different areas (domains) of life over time.

Two versions of the framework exist: a short form questionnaire, asked of all participants; and a long form asked of a sample of new participants each year. Different questionnaires (both for participants and for their families and carers) have been developed for defined participant age groups, recognising that different milestones are important at varying stages of life.

The framework covers areas (or domains) that are not the direct responsibility of the NDIS—such as the ‘health and wellbeing’ domain, which includes questions on the health outcomes of NDIS participants aged 15 and over. The short form includes 4 health-related questions: self-rated health; whether the participant has a regular doctor; difficulties accessing health services; and visits to hospital. The long form includes a much broader range of questions, asking (in addition) about the participant’s outlook on life, health screening, diet and exercise, alcohol consumption, smoking, mental health (the Kessler 6), and resilience (the Brief Resilience Scale). A selection of health and wellbeing questions is also included in the questionnaires for families and carers.

Some initial results from the NDIS health and wellbeing domain short form are included in this snapshot. This information was collected from around 35,000 transition participants aged 25 and over with a first plan approved between 1 July 2016 and 30 September 2017.

## **Mental health**

Experiences of disability often involve mental health issues. Mental health conditions can be both a cause and an effect of disability, and often involve activity limitations and participation restrictions beyond the ‘core’ areas of communication, mobility and self-care—for example, in personal relationships.

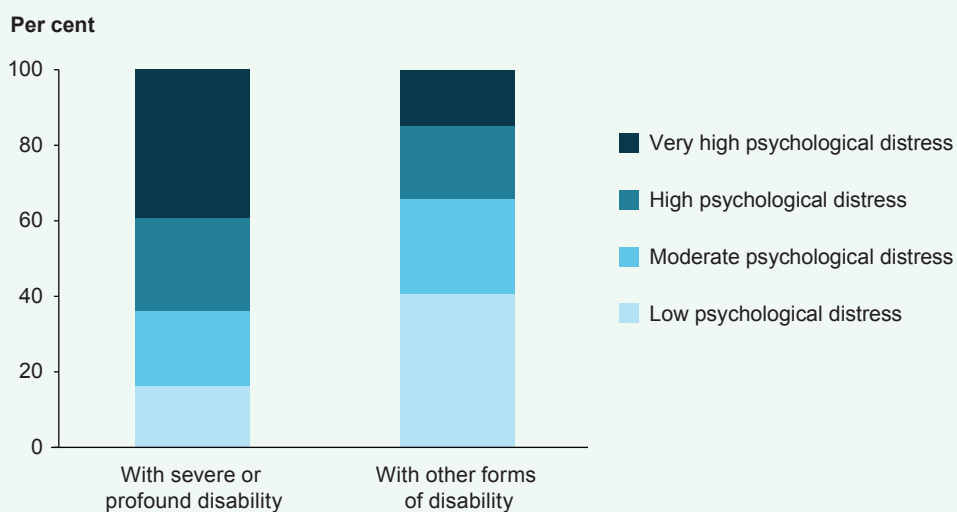
Notwithstanding this broader scope, almost half (47%) of people with severe or profound core activity limitation, and more than one-third (37%) of people with other forms of disability, self reported anxiety-related problems in 2014–15 (ABS 2016c). This compares with 11% of people without disability (ABS 2016c).

An estimated 43% of people with severe or profound disability self reported that they had mood (affective) disorders such as depression, compared with 35% of people with other forms of disability, and 7.3% of people without disability (ABS 2016c).

People with severe or profound disability had higher levels of psychological distress compared with people with other forms of disability in 2015 (Figure 5.4.2). Higher levels of psychological distress indicate that a person may have, or is at risk of developing, mental health issues.

See Chapter 3.12 'Mental health' for more information on the mental health of the general Australian population.

**Figure 5.4.2: Level of psychological distress, by broad disability status, 2015**



*Note:* People with disability aged 18–64. Level of psychological distress measured using the Kessler Psychological Distress Scale (K10).

*Source:* ABS 2016b; Table S5.4.2.

## Risk factors

Limitations in activities and restrictions in participation can affect people's lifestyles and pose risks for health.

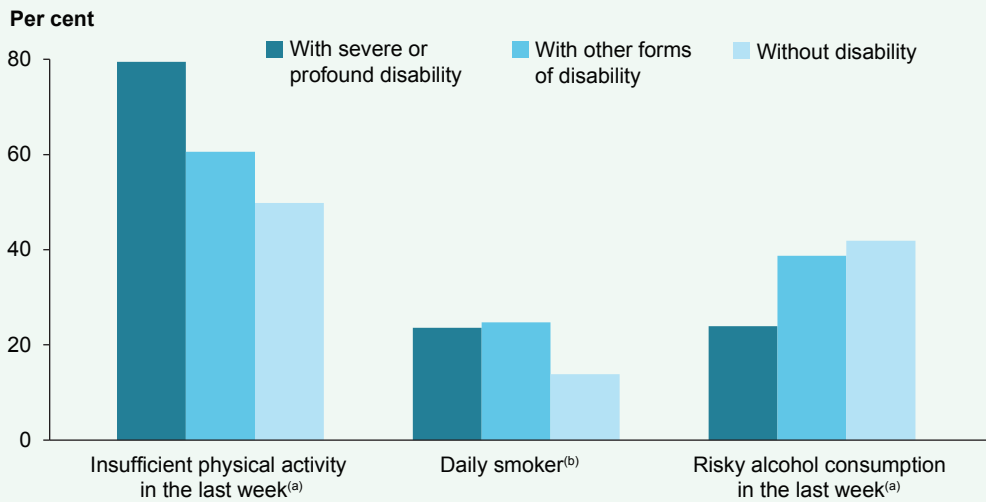
In 2014–15, compared with people without disability, people with disability were:

- more likely to report an insufficient level of physical activity in the last week
- more likely to report that they smoked daily
- less likely to report risky alcohol consumption in the last week (Figure 5.4.3).

See chapters 4.5 'Tobacco smoking', 4.6 'Alcohol risk and harm', 4.8 'Insufficient physical activity' for more information on risk factors for the general Australian population.



**Figure 5.4.3: Prevalence of selected risk factors, by broad disability status, 2014–15**



(a) Aged 18–64.

(b) Aged 15–64.

Source: ABS 2016c; Table S5.4.1.

## Health care

People with disability generally use health services—such as general practitioners (GPs), medical specialists and hospital emergency departments—more than people without disability. For example, in 2014–15, 93% of people with disability had visited a GP, 58% had visited a medical specialist, and 20% had visited a hospital emergency department in the last 12 months, compared with 82%, 26%, and 10%, respectively, of people without disability (ABS 2016c).

**Compared with people with other forms of disability, people with severe or profound disability were more likely to visit, in the last 12 months:**



a GP for urgent care  
**24%** compared with 18%



a medical specialist  
**70%** compared with 59%



a hospital emergency department  
**29%** compared with 24%

Source: ABS 2016b; Table S5.4.2.

In 2015, about 1 in 8 (13%) people with disability who went to an emergency department in the last 12 months felt that their GP could have provided that care instead (ABS 2016b). Some people with disability experience difficulties in accessing health services, such as unacceptable or lengthy waiting times, cost, inaccessibility of buildings, and discrimination by health professionals. They may also experience issues caused by lack of communication between different health professionals who treat them. This can vary by the extent or severity of disability (Table 5.4.1).

**Table 5.4.1: Difficulties in accessing health services in last 12 months, by broad disability status, 2015**

	With severe or profound disability (%)	With other forms of disability (%)
Had difficulty accessing medical facilities	38.2	34.5
Experienced unfair treatment or discrimination from health staff	20.2	16.0
Delayed or did not see a GP because of the cost	20.5	19.1
Waited longer than they felt was acceptable to get an appointment with a GP	26.2	21.0
Delayed or did not see a medical specialist because of the cost	23.5	27.9
Waited longer than they felt was acceptable to get an appointment with a medical specialist	32.6	28.5
Delayed or did not see a dentist because of the cost	57.9	65.7
Still waiting to receive public dental care	33.7	35.7
Delayed or did not go to hospital because of the cost	22.3	24.7
Experienced issues caused by lack of communication among different health professionals	20.4	16.1

Source: ABS 2016b; Table S5.4.2.

As the patient experience information in the SDAC is collected only from people with disability and their carers, it is not possible to make direct comparisons with people without disability. Although from a different source, information from the ABS Patient Experience Survey 2015–16 (ABS 2016e) suggests that people with disability are more likely to face barriers such as cost when accessing some types of health services. For example:

**Compared with all Australians, because of the cost, people with disability aged 15–64 were more likely to delay seeing, or not see, in the last 12 months:**



a GP  
**20%** compared with 16%



a dentist  
**65%** compared with 61%

Sources: ABS 2016b, 2016e.

The NDIS Outcomes Framework (Box 5.4.2) collects information on areas outside the responsibility of the NDIS, such as use of, and access to, health services. Initial results suggest that NDIS participants had some difficulty accessing or using health services, with about 1 in 3 (32%) people aged 25 and over having trouble (NDIA 2017). Reasons included access issues (9%), no support (6%), no transport (5%), the attitudes and/or experience of health professionals (6%), and cost (5%) (NDIA 2017).

NDIS participants are more likely than Australians generally to go to hospital—41% had been to hospital at least once in the last 12 months, compared with 11% of Australians aged 25–64 in 2016–17 (ABS 2017; NDIA 2017). They also attend hospital more often—56% of NDIS participants who had attended hospital in the past 12 months had been more than once, compared with 23% of Australians aged 25–64 who had been to hospital (NDIA 2017; ABS 2017).

## What is missing from the picture?

The NDIS data presented in this snapshot signal the potential for much richer data on the subset of all people with disability who are NDIS participants. As the NDIS matures, it is expected that comprehensive data on assessed needs, supports provided and goals met (outcomes) will be collected and progressively made available for further research and policy development.

One key data gap relates to the availability of administrative data on the use of mainstream health services by people with disability. At present, many health-related data collections—such as those on hospitals, the Medicare Benefits Schedule, and the Pharmaceutical Benefits Scheme—do not include a way to identify if a person has disability. This limits the ability to report comprehensively on the use of specific health services and to examine the interactions between health and other service sectors.

## Where do I go for more information?

More information about access to health services by people with disability is available in the web report <[www.aihw.gov.au/reports/disability/access-health-services-disability/contents/content](http://www.aihw.gov.au/reports/disability/access-health-services-disability/contents/content)>.

See the ABS website for more information on the [SDAC](#), the [NHS](#), and the [Patient Experience Survey](#). See the National Disability Insurance Agency website for more information on the [NDIS](#).

## References

- ABS (Australian Bureau of Statistics) 2016a. Disability, ageing and carers, Australia: summary of findings, 2015. ABS cat. no. 4430.0. Canberra: ABS.
- ABS 2016b. Microdata: disability, ageing and carers, Australia, 2015. ABS cat. no. 4430.0.30.002. Canberra: ABS. AIHW analysis of the confidentialised unit record file.
- ABS 2016c. Microdata: National Health Survey, 2014–15. ABS cat. no. 4324.0.55.001. Canberra: ABS. AIHW analysis of ABS TableBuilder.
- ABS 2016d. National Health Survey: users' guide 2014–15. ABS cat. no. 4363.0. Canberra: ABS.
- ABS 2016e. Patient experiences in Australia: summary of findings, 2015–16. ABS cat. no. 4839.0. Canberra: ABS.
- ABS 2017. Patient experiences in Australia: summary of findings, 2016–17. ABS cat. no. 4839.0. Canberra: ABS.
- NDIA (National Disability Insurance Agency) 2017. National Disability Insurance Scheme, unpublished data. Canberra: NDIA.
- WHO (World Health Organization) 2001. International Classification of Functioning, Disability and Health. Geneva: WHO.

## 5.5 Lesbian, gay, bisexual, transgender and intersex people

The abbreviation LGBTI, often used to refer to people of diverse sex, gender and sexual orientation, stands for lesbian, gay, bisexual, transgender, or intersex. However, the limitations of this term when trying to describe the full extent of people's genders, relationships, sexualities and lived experiences should be acknowledged.

Part of the challenge in identifying and reporting on the health of the LGBTI population stems from the lack of data sources that include information on diverse sex, gender and sexual orientation—both administrative data collections and population-based surveys. This snapshot presents information from those few known data sources that do include such information. It refers primarily to people who identify as homosexual, bisexual, heterosexual, or other sexual orientation.

### Who are LGBTI people?

Collectively, LGBTI people are recognised as a specific minority population group. Individually, they come from all walks of life and are part of all other population groups. How LGBTI people identify themselves is influenced by many factors, including their age, ethnicity, socioeconomic position and their lived experiences and relationships with others.

It is estimated that about 1 in 10 (11%) Australians identify as LGBTI (AHRC 2014). The 2016 National Drug Strategy Household Survey estimates that 3.2% of adults identify as homosexual or bisexual and 2.4% as not sure/other orientation.

Analysis of the 2016 Census of Population and Housing shows that the number of same-sex couples in Australia represents around 1 in 100 (0.9%) of all couple families (either with or without children) (ABS 2017). Just under half of same-sex couples are female (49%), and one-quarter (25%) of female same-sex couples have children. Despite there being slightly more male same-sex couples, a considerably smaller proportion of male same-sex couples have children (4.5%). People in same-sex couples tend to be younger than people in opposite-sex couples (median ages of 40 and 48, respectively) (ABS 2017).

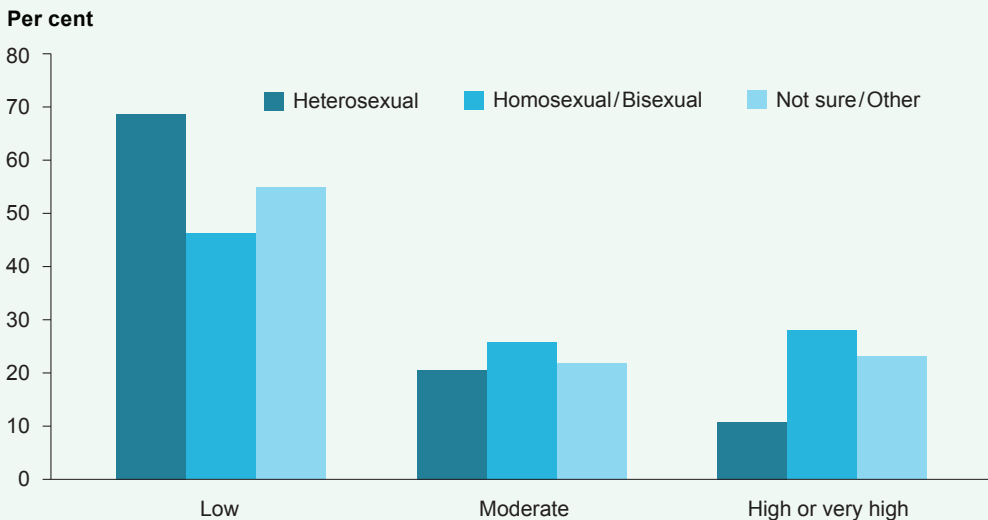
People in same-sex couples are more likely to live in capital cities, tend to be more highly educated, have higher labour force participation rates and earn higher incomes than people in opposite-sex couples (ABS 2017).

# How healthy are LGBTI people?

Evidence from small-scale LGBTI targeted studies, and some larger population-based surveys, indicate that LGBTI people face disparities in terms of their mental health (ABS 2008), sexual health (KI 2017) and rates of substance use.

The 2016 National Drug Strategy Household Survey found that adults who identified as homosexual or bisexual or not sure/other sexual orientation reported higher levels of psychological distress than heterosexual adults. Figure 5.5.1 shows that experiencing high or very high psychological distress was more likely to be reported for homosexual or bisexual people (28%) and people who were not sure/other (23%) compared with heterosexuals (11%).

**Figure 5.5.1: Level of psychological distress<sup>(a)</sup>, people aged 18 and over, by sexual orientation, 2016**



(a) Reported low, moderate, high or very high psychological distress on the Kessler Psychological Distress Scale (K10).

Source: National Drug Strategy Household Survey; Table S5.5.1.

The most recent National Survey of Mental Health and Wellbeing estimated that almost 1 in 3 (32%) homosexual/bisexual people aged 16 and over in Australia met the criteria for an anxiety disorder in the previous 12 months, compared with 1 in 7 (14%) heterosexual people (ABS 2008). Similarly, almost 1 in 5 (19%) homosexual/bisexual people met the criteria for an affective disorder in the previous 12 months compared with 1 in 17 (6.0%) heterosexual people.

While national suicide data by diverse sex, gender and sexual orientation are not available, there is evidence that LGBTI people are at a higher risk of suicidal behaviours (Skerrett et al. 2015) and have the highest rates of suicidality compared with any population in Australia (see Glossary) (Rosenstreich 2013).

The 2016 National Drug Strategy Household Survey found that illicit drug use in the last 12 months was more common among people who identified as homosexual or bisexual (42%) than among heterosexual people (14%). This pattern was seen across all age groups. Considering only those people with high or very high psychological distress, homosexual or bisexual people were more likely to smoke cigarettes (35%), consume an average of more than 2 standard alcohol drinks per day (28%) and engage in illicit drug use (51%) than heterosexual people (29%, 22%, and 27%, respectively). It has been suggested that many LGBTI people use these substances to cope with the discrimination and difficulties that LGBTI people regularly experience, that there may be a normalisation of substance use in some LGBTI social settings, and that people who identify as being homosexual or bisexual are generally more accepting of regular adult use of drugs than people who are heterosexual (Leonard et al. 2015).

Research undertaken by the Kirby Institute shows that the proportion of gay and bisexual men reporting condomless intercourse with casual male partners in the past 6 months increased from 38% in 2012 to 44% in 2016 (Kirby Institute 2017). The Gay Community Periodic Surveys estimate that among gay and bisexual men who had intercourse with casual male partners in the previous 6 months, 40% reported consistent condom use in 2016 and 44% in 2013 (Mao et al. 2017). By comparison, the most recent Australian Study of Health and Relationships 2012–2013 estimates that, of people who had casual sex in the previous 6 months, 49% of people who had vaginal intercourse and 48% of heterosexual men always used a condom (Kirby Institute 2017; Richters et al. 2014).

Male-to-male sex continues to be the major HIV risk exposure in Australia, with 70% of new HIV diagnoses in 2016 attributed to male-to-male sex (Kirby Institute 2017). From 2014, pre-exposure prophylaxis for HIV prevention (PrEP) became available in Australia and, from 2016, large state-funded PrEP programs were implemented in some states. This has resulted in an increase in the uptake of PrEP among non-HIV-positive gay and bisexual men—from 1.9% who reported PrEP use in the previous 6 months in 2015 to 4.9% in 2016—according to the Gay Community Periodic Surveys (Kirby Institute 2017).

## What is missing from the picture?

As outlined in this snapshot, there are known data limitations in reporting on sex- and gender-diverse populations in Australia. Also, the available information reported here is limited to gay, lesbian and bisexual people. It is currently not possible to accurately describe the health of LGBTI people in Australia due to the lack of national population-based data collections that include relevant data items. This situation could be dealt with by developing a nationally agreed set of LGBTI data items for inclusion in population based-surveys and administrative data sets, where relevant.

The Australian Bureau of Statistics has released the Standard for Sex and Gender Variables (ABS 2016), which defines standard classification categories for capturing information about sex and gender in data collections. It is expected that, over time, the new standard will result in improved data about sex and gender diversity in Australian health data collections.

## Where do I go for more information?

For more information on the health of LGBTI people in Australia see the National LGBTI Health Alliance website <[www.lgbtihealth.org.au](http://www.lgbtihealth.org.au)>. It provides information on LGBTI health-related programs, services and research, focused on LGBTI and other sexuality- and gender-diverse people and communities.

### References

- ABS (Australian Bureau of Statistics) 2008. National Survey of Mental Health and Wellbeing 2007: summary of results. ABS cat. no. 4326.0. Canberra: ABS.
- ABS 2016. Standard for sex and gender variables. ABS cat. no.1200.0.55.012. Canberra: ABS.
- ABS 2017. Census of population and housing: reflecting Australia—stories from the census, 2016, same-sex couples in Australia, 2016. ABS cat. no. 2071.0. Canberra: ABS.
- AHRC (Australian Human Rights Commission) 2014. Face the facts: lesbian, gay, bisexual, trans and intersex people. Sydney: Australian Human Rights Commission.
- Kirby Institute 2017. HIV, viral hepatitis and sexually transmissible infection in Australia: annual surveillance report 2017. Sydney: KI, University of NSW.
- Leonard W, Lyons A & Bariola E 2015. A closer look at private lives 2: addressing the mental health and well-being of lesbian, gay, bisexual and transgender (LGBT) Australians. Monograph series no. 103. Melbourne: The Australian Research Centre in Sex, Health and Society, La Trobe University.
- Mao L, Holt M, Newman C & Treloar C (eds) 2017. Annual report of trends in behaviour 2017: HIV and STIs in Australia. Sydney: Centre for Social Research in Health, UNSW Sydney.
- Richters J, de Visser R, Rissel C & Grulich A 2014. Australian study of health and relationships: sex in Australia 2 summary. Sydney: University of NSW. Viewed 2 February 2018, <<http://www.ashr.edu.au/>>.
- Rosenstreich G 2013. LGBTI people: mental health and suicide. 2nd edn, rev. Sydney: National LGBTI Health Alliance.
- Skerrett DM, Kőlves K & De Leo D 2015. Are LGBT populations at a higher risk for suicidal behaviours in Australia? Research findings and implications. *Journal of Homosexuality* 62:883–901.

## 5.6 Veterans

The term 'veteran' has traditionally been used to describe former Australian Defence Force (ADF) personnel who were deployed to serve in war or war-like conflict environments.

This article takes a broader approach, defining a veteran as a person with any experience in the ADF. The veteran community broadly refers to veterans and their families and carers, and to the ex-service organisations that support them (Hodson & McFarlane 2016; Tehan 2017c). For many veterans, their unique service experience means they may have unique health-related requirements above those of the broader community.

This article focuses on specific aspects of health for known veterans but is somewhat limited by the availability of data on the whole veteran population. Due to the historically small number of women in the ADF, most results are only presented for men.

### Diverse veteran community

Veterans include current serving, reserve and ex-serving personnel both with and without operational experience—such as service in World War II, in Korea and Vietnam, in peacekeeping operations and operations in the Middle East. The veteran community also includes partners and dependants, carers, war widows and widowers. Veterans are a diverse group, with different roles and experiences in the ADF. The diversity of the group is reflected in the range of definitions currently used for a veteran. Most broadly, a veteran can be defined as any 'person who is serving or has served in the ADF' (Tehan 2017a). In 2016–17, there were around:

- 58,200 Australians serving in the ADF Permanent Force—0.3% of the Australian population aged 16 and over
- 5,300 ADF Permanent Force separations
- 320,000 veterans who had been deployed—1.6% of the Australian population aged 16 and over. (Note: This estimate does not represent a complete picture of veterans as not all will have been deployed)
- 291,000 Department of Veterans' Affairs (DVA) clients—more than 55% of these were veterans themselves and the rest were their families—this group represented 1.2% of the whole Australian population (ABS 2017; Defence 2017a; Tehan 2017c).

The DVA estimates that around only 1 in 5 (20%) veterans are clients for whom it holds information on their health and welfare status and access to services; this means that the health and welfare status of the remaining veteran population is largely unknown (DVA 2017c).



As the environment in which the ADF operates continues to change, so, too, do the composition and needs of current and future veteran cohorts and their families. An increase in military operations over the last decade or so has resulted in a new cohort of contemporary veterans. While this cohort shares the military experience of previous generations, their needs differ from those of their predecessors, due to factors such as the impact of multiple deployments or deploying as smaller contingents or individuals, rather than larger unit formations; the nature of recent warfare; and an extended working life for many members after their discharge (DVA 2013).

## Who is responsible for veterans' health and welfare?

The Department of Defence is responsible for the health care of current serving ADF members up until the date of their transition to civilian life; this includes primary health care, dental and mental health services, hospital care, ancillary health care specialist services, diagnostic and radiology services, rehabilitation and suicide prevention (Defence 2016; DVA 2017a).

After transition, these people can access health care services under Medicare, state and territory government health arrangements, the private sector and (if relevant) those administered by the DVA for eligible veterans, war widows and widowers and dependants. DVA funds a wide range of payments and services—including pensions, compensation and income support, as well as health services such as medical, dental, allied health, specialist services, hospitals, pharmaceuticals, surgery, whole-of-person rehabilitation, counselling, transport and home care (DVA 2017a).

DVA and the Department of Defence are jointly responsible for support for personnel transitioning from the ADF into civilian life (JSCFADT 2015). The Defence transition program provides ADF personnel and their families with support and services that include tailored career coaching, Your Money and You (financial information), medical (including registering for Medicare, sourcing private health insurance, and finding a general practitioner), funding for financial counselling, employment and interview skills, training and education, housing and relocation, and rehabilitation and compensation as needed (Defence 2017b).

## Risk and protective factors of ADF service

The service experience of ADF members may have an impact on their health needs as veterans, presenting both protective factors and risk factors for their health. Their type of service, rank, length of service, reason for discharge and transition experience are some factors that may have an effect (AIHW 2018; Kang et al. 2015; Katz et al. 2012; Hoffmire et al. 2015).

The healthy worker effect is demonstrated by the generally better health and lower mortality rates of employed populations compared with the general population—usually due to lower participation in employment among people with serious illness, injury or disability. Several studies have recognised the ‘healthy soldier effect’ as protection afforded above that of the general employed population, due mainly to their ongoing need to stay fit and to having ready access to health care during service (Harrex et al. 2003; Kang et al. 2015). While ex-serving personnel may no longer have the protective benefits of ready access to health care, some of the benefits of good physical health may remain and be reflected in the lower all-cause mortality rate in ex-serving ADF personnel compared with an age-matched population of Australian men (AIHW 2018).

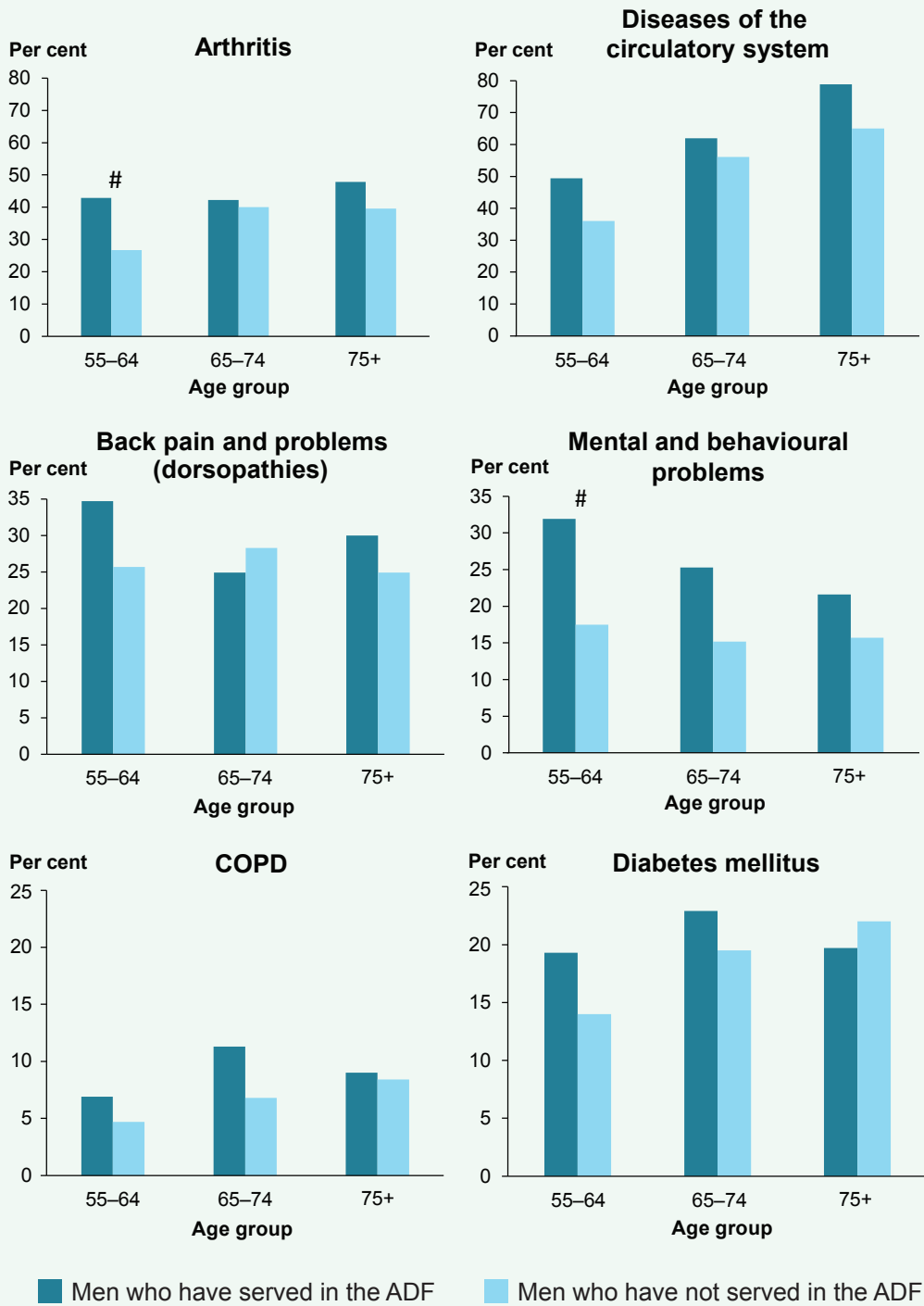
Transition from military to civilian life is an important event in a veteran’s life. While many have transitioned without seeking help, others find the process difficult and uncertain. They move from the structured, purpose-driven and supported military environment—where housing, medical services, training and education are provided or subsidised as a condition of service—to the largely unstructured and unsupported nature of civilian life (Defence 2017b). The transition process is thus recognised as a time of stress, anxiety, vulnerability and uncertainty for some individuals (DVA 2013; JSCFADT 2015; Kapur et al. 2009). People leaving the military with service-related problems such as chronic ill health, injury, chronic pain or psychological concerns may experience greater difficulties (DVA 2017b).

## What do we know about the health of Australia’s veterans?

Due to limitations in the data currently available on veterans, a comprehensive picture of the health of the veteran population cannot be provided. Work is currently underway in a number of areas to deal with this gap, including the Transition and Wellbeing Research Program, via research commissioned under DVA’s Applied Research Programme and the strategic partnership between DVA and AIHW (see sections ‘What is the AIHW doing?’ and ‘What is missing from the picture?’ for further details).

According to the 2014–15 National Health Survey, men aged 55 and over who served in the ADF generally report similar rates of selected chronic conditions—arthritis, back pain and problems, chronic obstructive pulmonary disease (COPD), diabetes mellitus, diseases of the circulatory system and mental and behavioural problems—as men in the same age group who have not served. However, men aged 55–64 who served in the ADF report higher rates of mental and behavioural problems and arthritis than men of the same age who have not served—1.8 times and 1.6 times higher, respectively (Figure 5.6.1).

Figure 5.6.1: Prevalence of selected chronic conditions for men aged 55 and over, by age group and ADF service status, 2014–15



# = A statistically significant difference between the ADF population group and Australian men of the same age.

Source: ABS 2016; Table S5.6.1.

According to self-reported data in the 2014–15 National Health Survey (NHS), after adjusting for differences in age structure, men aged 18 and over who had ever served in the ADF were as likely to rate their health as 'very good' or 'excellent' as men who had not served (56% and 55%, respectively).

The 2010 ADF Mental Health Prevalence and Wellbeing Study found that 1 in 5 (22%) people in the ADF population experienced a mental disorder in the previous 12 months. More than half (54%) of the ADF population had experienced an anxiety, affective or alcohol use disorder at some stage in their lifetime, which was higher than that among the Australian community (49%). Men in the ADF had a greater prevalence of affective disorders (9.4%) than men who had not served (5.7%) and a lower prevalence of alcohol disorders (5.6%) than men who had not served (8.8%) (Van Hooff et al. 2014).

## Incidence of suicide among serving and ex-serving ADF personnel

There has been ongoing concern within the ADF, veteran and wider Australian communities about the incidence of suicide in serving and ex-serving ADF personnel. However, until recently, there was a lack of rigorous statistical evidence to inform targeted strategies and plans to support people at risk. A recent study has provided accurate numbers and rates of suicide death among contemporary ADF personnel who have at least 1 day of service from 1 January 2001 (AIHW 2016b, 2018). Suicide rates were examined for three ADF populations—those serving full time, in the reserves and ex-serving personnel (hereafter referred to as the 3 ADF populations; Box 5.6.2). Comparisons were made with the Australian population (AIHW 2016b, 2018), and service-related characteristics associated with suicide death in ex-serving personnel were presented (AIHW 2018).

### Box 5.6.2: Defining the 3 ADF populations

The term 'ADF personnel' refers to serving, reserve and ex-serving ADF members. It does not include civilian personnel employed by the Department of Defence.

**Serving full time:** ADF members serving in a regular capacity in the Royal Australian Navy (Navy), Australian Army (Army) or the Royal Australian Air Force (Air Force) on or after 1 January 2001, on continuous full-time service, or participating in the gap year program.

**Reserve:** ADF members in the active or inactive reserve forces for the Navy, Army or Air Force on or after 1 January 2001. Most members leaving full-time service transition to the inactive reserve forces, unless there are medical or other grounds preventing this.

**Ex-serving:** ADF members in the serving or reserve population on or after 1 January 2001 and who were discharged after 1 January 2001. The ex-serving population increased by around 5,000 per year in the period of study (2001–2015).

Between 2001 and 2015, there were 325 suicide deaths among people with at least 1 day of ADF service since 2001. Of these, 51% (166) were ex-serving at the time of their death, 28% (90) were serving full time and 21% (69) were in the reserves.

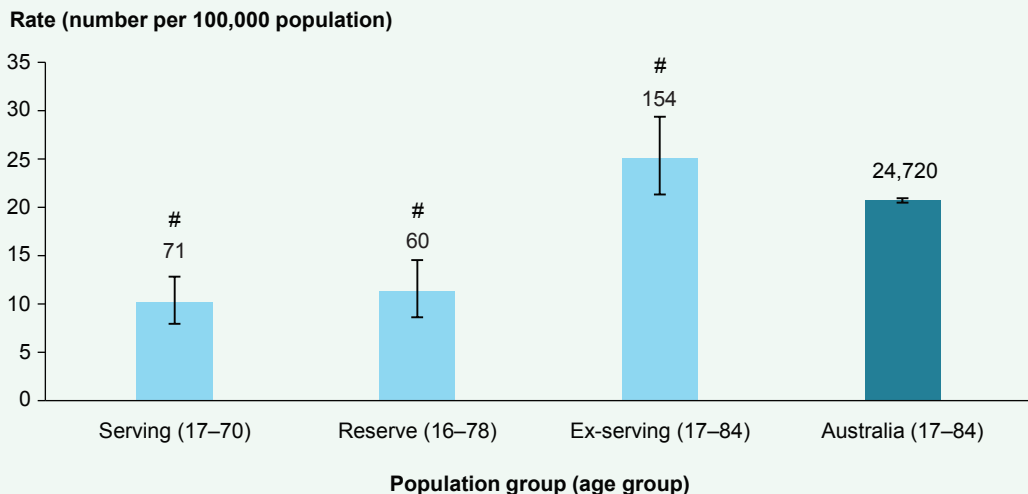
Men made up 84% of the ADF populations examined in the study. The clear majority of suicide deaths identified occurred among men—93% (303 deaths), with 6.8% (22 deaths) among women.

The rate of suicide death among women in the 3 ADF populations was highest for women aged 18–29 (AIHW 2018). This was similar to the rate in Australian women of the same age. Due to the smaller number of women in the study, further detailed analysis on women was not possible.

Suicide rates among men serving full time or in the reserves were lower than rates for all Australian men (AIHW 2018; Figure 5.6.2). In contrast, the suicide rate for ex-serving men was:

- 1.2 times as high as the rate for men in the Australian population—however, after adjusting for age, the rates are similar; this result is still of interest, though, when considered in the context of the lower all-cause mortality in ex-serving men compared with all Australian men
- 1.7 times as high for men aged 18–29 compared with all Australian men of the same age (Figure 5.6.3)
- more than twice as high as for men serving full time or in the reserves (Figure 5.6.2); for ex-serving men aged 18–29, the suicide rate was around 3 times as high as for men of the same age serving full time or in the reserves (Figure 5.6.3)
- more than twice as high as for ex-serving women.

**Figure 5.6.2: Crude rate of suicide death, ADF populations compared with Australian men, 2002–2015**

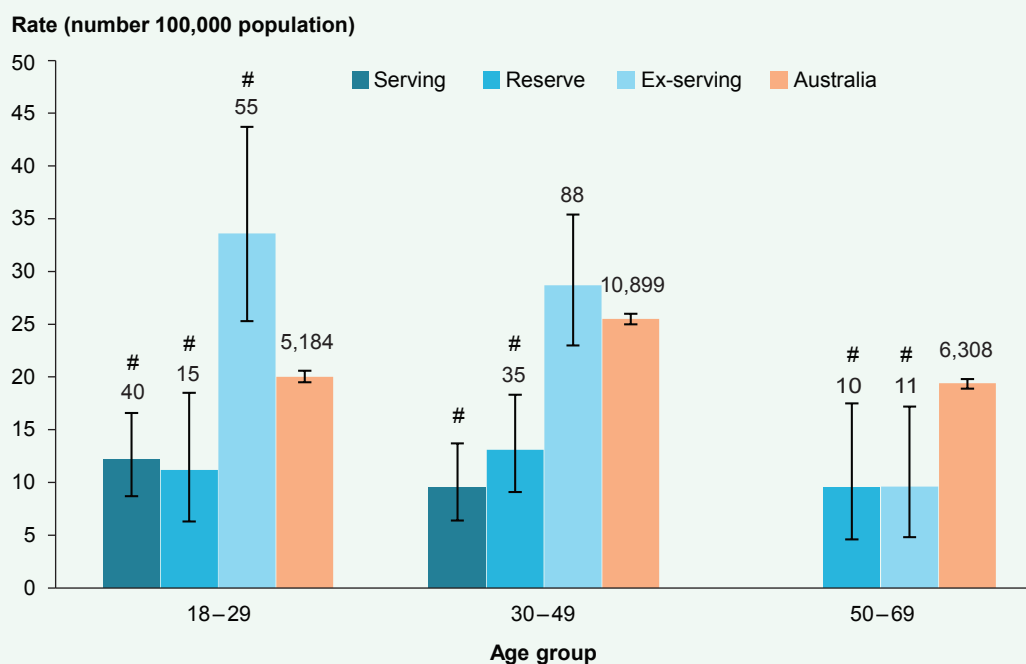


# = A statistically significant difference between the ADF population group and Australian men of the same age.

*Note:* The number of deaths in each group is displayed above the bars. The thin vertical lines superimposed over the top end of each bar are 95% confidence intervals (CIs). The rate shown for Australian men is based on the age range of the ex-serving population (ages 17–84, crude rate = 21.7). The crude rate in Australian men aged 17–70 is 21.8 and for men aged 16–78, is 21.4.

*Sources:* National Mortality Database 2002–2015; Linked PMKeyS–National Death Index data 2002–2015; Table S5.6.2.

Figure 5.6.3: Suicide death, rate for ADF populations and all Australian men, by age, 2002–2015



# = A statistically significant difference between the ADF population group and Australian men of the same age.

Note: The number of deaths in each group is displayed above the bars. Where a number is not shown, it has been suppressed to ensure confidentiality. The thin vertical lines superimposed over the top end of each bar are 95% CIs.

Sources: National Mortality Database 2002–2015; Linked PMKeyS–National Death Index data 2002–2015; Table S5.6.3.

The following service-related characteristics were associated with higher risk of suicide death among ex-serving men:

- medical discharge—suicide in men discharged involuntarily for medical reasons is 1.9 times more likely than in men discharged voluntarily
- all ranks other than commissioned officers—ex-serving personnel separated in all ranks other than commissioned officer are 2.2 times more likely to die by suicide than commissioned officers.

Length of service was not a significant predictor of suicide death once all available information—age, service (Navy, Army, Air Force), rank, reason for discharge and the time between discharge from the ADF and death—was controlled for (AIHW 2018). However, results suggest an increased likelihood of suicide in ex-serving men with less than 1 year of service when compared with men who had served 10 years or more.

The key findings for this study are calculated from certified deaths information only. Differences between the results for this study and other publicly reported estimates may be due to the study scope and/or the source of cause of death information. Other factors to consider when interpreting these results are described in the full report (AIHW 2018).

While these results cannot indicate if a particular characteristic is the cause of the suicide death, they do help to identify groups of people who may be at higher risk of suicide death—including personnel discharged for medical reasons and personnel discharged in all ranks other than commissioned officers. This information has helped to inform policy and to increase supports to reduce suicide rates among serving and ex-serving ADF personnel. Since 1 July 2017, in response to the findings of this study, the Australian Government has made free mental health treatment available to all current and former members of the permanent ADF, and implemented case management services for personnel discharged from a mental health hospital (Australian Government 2017; Tehan 2017b).

The Australian Government has also committed to the annual monitoring of key findings from the study (Australian Government 2017). The AIHW will continue to independently track these data to further our understanding of this complex issue and to inform future policy and interventions to reduce suicide rates among serving and ex-serving ADF personnel.

## Mortality and cancer incidence in aircraft maintenance personnel

Between 1974 and 2000, the Air Force undertook a series of formal Deseal/Reseal (DSRS) programs, alongside informal repair activities, to correct fuel leaks inside the fuel tanks of F-111 aircraft. Several concerns were raised about health outcomes among Air Force personnel who worked on these programs and associated activities at the Air Force Base at Amberley in Queensland. The repair work was suspended in 2000, and a series of inquiries and health studies followed—one of these was the Mortality and Cancer Incidence Study (MCIS) (AIHW 2016a).

The purpose of the MCIS was to determine whether the personnel exposed to (involved in) the DSRS programs at Amberley (the DSRS Study Population) experience higher than expected rates of mortality or cancer incidence compared with two groups of non-exposed Air Force personnel based at Amberley and Richmond (Comparison populations; see Box 5.6.4). The number of exposed women in the study population was too small for meaningful comparisons, so the DSRS Study and Comparison populations include men only.

### Box 5.6.4: Comparison populations

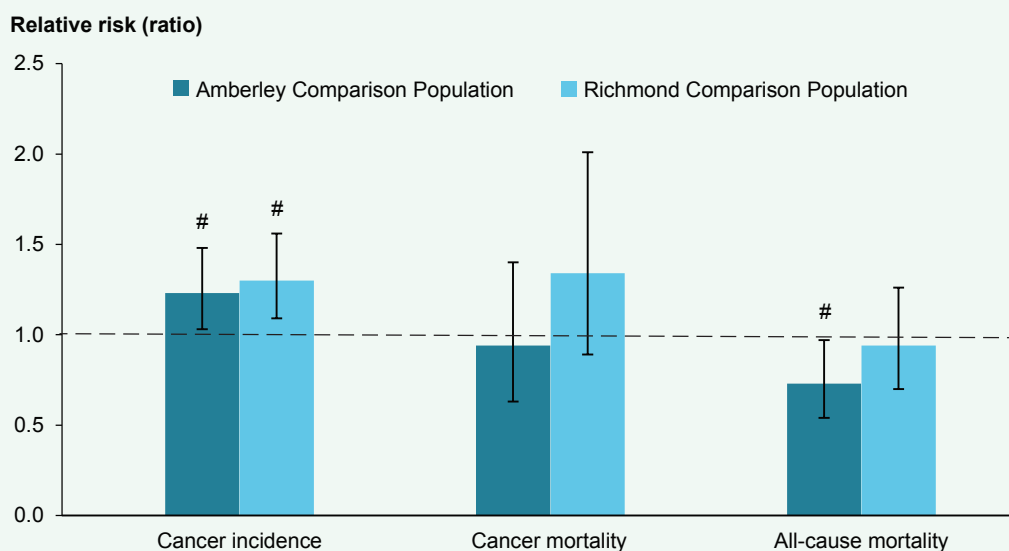
The two Comparison populations were matched to the DSRS Study Population by age, sex, rank, and posting/exposure category—but differed by occupation and environment/location. These populations were:

- the Air Force Base Amberley Comparison Population—sourced from individuals with similar environmental exposures (located at the same base, in Queensland), but different occupational exposures (non-technical role)
- the Air Force Base Richmond Comparison Population—sourced from individuals with similar occupational exposures (technical, aircraft maintenance), but different environmental exposures (located at a different base, in New South Wales).

Four iterations of the MCIS have been undertaken to date. Findings from the fourth study in relation to cancer incidence in 1982–2010 show that, of the 149 cancers diagnosed, the most common were prostate cancer (21% of all cancers), melanoma of the skin (17%) and colorectal cancer (13%). The MCIS confirms that the personnel exposed to the DSRS programs at Amberley experience higher than expected rates of cancer incidence compared with the two groups of non-exposed Air Force personnel based at Amberley and Richmond. Results also show that involvement in the DSRS programs was associated with:

- a 23%–30% increase in the rate of cancer diagnosis (compared with both the Amberley and Richmond Comparison populations) (Figure 5.6.4)
- a 39% increase in the rate of cancer diagnosis (compared with the Australian population)
- higher incidence of non-Hodgkin lymphoma (more than 2 times as high compared with the Amberley Comparison Population)
- higher incidence of lung cancer (nearly 2 times as high compared with the Richmond Comparison Population) (AIHW 2016a).

**Figure 5.6.4: Relative risk ratios for cancer incidence (1982–2010), cancer mortality and all cause mortality (1999–2012): DSRS Study Population compared with Comparison populations**



# = Indicates statistically significant finding at the 95% CI.

*Note:* The dashed horizontal line marks where relative risk is 1.0. If the relative risk is greater than 1.0, the number of cancers or deaths in the Study population is higher than that for the Comparison populations. If the relative risk is less than 1.0, the number of cancers or deaths in the Study population is lower than that for the Comparison population. The thin vertical lines represent the 95% CI around the (weighted) incidence/mortality relative risk. That is, there is 95% certainty that the true difference in incidence/mortality rates between the Study population and the Comparison populations sits within that interval.

*Sources:* AIHW linkage analysis of the Australian Cancer Database 2010 and the National Death Index; Table S5.6.4.



There were 52 deaths from all causes in the fourth MCIS Study Population in 1999–2012, making the all-cause mortality rate in the DSRS Study Population lower when compared with the Amberley Comparison Population (27%) (AIHW 2016a). Of these deaths, 29 (56%) were from cancer, making it the leading cause of death for that population.

When interpreting these findings, it is important to keep in mind the nature of the ongoing scrutiny of the Study Population and their health status, which can introduce biases into the study. Further information on the methods and factors to consider when interpreting these results can be found in the full report (AIHW 2016a).

## What is the AIHW doing?

DVA and the AIHW have established a 3-year strategic partnership from 2017–2020, to build a comprehensive profile of the health and welfare of Australia’s veterans, including current and ex-serving persons, their families and carers. A broad population-level approach will be taken—beyond current serving and DVA clients—to analyse health and welfare outcomes for veterans. Existing disparate data sources will be explored to identify opportunities to consolidate information from:

- survey data where people self-identify as having ADF service
- administrative data that include questions, variables or flags relating to ADF service or receipt of DVA entitlements
- future data integration.

## What is missing from the picture?

DVA estimates that only around 1 in 5 (20%) veterans are known to them as clients, for whom they hold a range of information about health and welfare status and access to services (DVA 2017c). This means that the health and welfare status of the remaining 80% of the veteran population is largely unknown.

Veterans are not readily identifiable in many general population health and welfare data sources. While some data sources include questions, variables or flags relating to ADF service or the receipt of DVA health and welfare entitlements, the different definitions used of ‘a veteran’ limits comparisons across these sources. Developing a standardised veteran indicator—and extending the use of this in existing surveys or administrative collections—would enable data on veterans to be consistently identified and analysed across a broader range of existing data sources.

Research focusing on a subset of the veteran population and/or particular conflicts—for example, Vietnam veterans—is limited in its capacity to support population-level analyses. As well, while survey and administrative by-product data sources cover aspects of multiple domains (including health, social support and housing), they are limited in both their capacity to provide holistic coverage of all domains and to support longitudinal analysis.

There are also substantial gaps for the education, employment, justice and safety, and income and finance domains.

As well, there are substantial gaps in our understanding of women’s experiences in the ADF. This is due to the historically small number of women represented in the ADF, which has limited this research.

## Where do I go for more information?

More information on veterans is available at <[www.aihw.gov.au/reports-statistics/population-groups/veterans/overview](http://www.aihw.gov.au/reports-statistics/population-groups/veterans/overview)>.

The report *Incidence of suicide among serving and ex-serving Australian Defence Force personnel* and other releases are available for free download.

The report *Fourth Study of mortality and cancer incidence in aircraft maintenance personnel: a continuing study of F-111 Deseal/Reseal personnel 2016* and previous releases are available for free download.

More information on the Department of Veterans' Affairs is available at <[www.dva.gov.au](http://www.dva.gov.au)>.

More information on the Department of Defence is available at <[www.defence.gov.au](http://www.defence.gov.au)>.

More information on the Australian Senate inquiry into suicide by veterans is available at <[www.aph.gov.au](http://www.aph.gov.au)>.

## References

ABS (Australian Bureau of Statistics) 2016. Microdata: National Health Survey, 2014–15, TableBuilder. ABS cat. no. 4324.0.55.001. Canberra: ABS. Findings based on AIHW analysis of ABS TableBuilder data.

ABS 2017. Australian demographic statistics, Dec. 2016. ABS cat. no. 3101.0. Canberra: ABS.

AIHW (Australian Institute of Health and Welfare) 2016a. Fourth study of mortality and cancer incidence in aircraft maintenance personnel: a continuing study of F-111 Deseal/Reseal personnel 2016. Cancer series no. 99. Cat. no. CAN 98. Canberra: AIHW.

AIHW 2016b. Incidence of suicide among serving and ex-serving Australian Defence Force personnel 2001–2014. Cat. no. PHE 212. Canberra: AIHW. Viewed 27 September 2017, <<http://www.aihw.gov.au/publication-detail?id=60129557674>>.

AIHW 2018. Incidence of suicide among serving and ex-serving Australian Defence Force personnel 2001–2015: detailed analysis. Cat. no. PHE 218. Canberra: AIHW.

Australian Government 2017. Australian Government response to the Foreign Affairs, Defence and Trade Committee Report: The constant battle—suicide by veterans. Tabled by the Minister for Veterans' Affairs 24 October 2017. Viewed 28 November 2017, <<https://www.dva.gov.au/consultation-and-grants/reviews/government-reports>>.

Defence (Department of Defence) 2016. Joint Health Command annual review 2015–16. Canberra: Department of Defence. Viewed 27 November 2017, <[http://www.defence.gov.au/health/home/docs/JHC\\_Annual\\_Review\\_2015-16.pdf](http://www.defence.gov.au/health/home/docs/JHC_Annual_Review_2015-16.pdf)>.

Defence 2017a. Annual report 2016–17. Canberra: Department of Defence. Viewed 27 November 2017, <<http://www.defence.gov.au/AnnualReports/16-17/>>.

Defence 2017b. Defence Community Organisation: leaving the ADF. Canberra: Department of Defence. Viewed 21 November 2017, <<http://www.defence.gov.au/dco/transition/>>.

DVA (Department of Veterans' Affairs) 2013. Veteran Mental Health Strategy: a ten year framework 2013–2023. Canberra: DVA.

DVA 2017a. Factsheet HSV01—health services available to the veteran community 2017. Canberra: DVA. Viewed 21 November 2017, <<https://www.dva.gov.au/factsheet-hsv01-health-services-available-veteran-community>>.

DVA 2017b. Factsheet VCS05—transition to civilian life 2017. Canberra: DVA. Viewed 21 November 2017, <<https://www.dva.gov.au/factsheet-vcs05-transition-civilian-life>>.

DVA 2017c. VetAffairs vol. 33, no. 3, Spring 2017. Viewed 21 November 2017, <<https://www.dva.gov.au/about-dva/publications/vetaffairs/vol-33-no3-spring-2017>>.

Harrex WK, Horsley KW, Jelfs P, Van Der Hoek R & Wilson EJ 2003. Mortality of Korean War veterans: the veteran cohort study. A report of the 2002 retrospective cohort study of Australian veterans of the Korean War. Canberra: DVA.

Hodson S & McFarlane A 2016. Australian veterans—identification of mental health issues. *Australian Family Physician* 45(3):89–98.

JSCFADT (Joint Standing Committee on Foreign Affairs Defence and Trade) 2015. Review of the Defence Annual Report 2013–14. Canberra: Joint Standing Committee on Foreign Affairs, Defence and Trade. Viewed 27 November 2017, <[http://www.aph.gov.au/Parliamentary\\_Business/Committees/Joint/Foreign\\_Affairs\\_Defence\\_and\\_Trade/2013-14\\_Defence\\_AR/Report](http://www.aph.gov.au/Parliamentary_Business/Committees/Joint/Foreign_Affairs_Defence_and_Trade/2013-14_Defence_AR/Report)>.

Kang HK, Bullman TA, Smolenski DJ, Skopp NA, Gahm GA & Reger MA 2015. Suicide risk among 1.3 million veterans who were on active duty during the Iraq and Afghanistan wars. *Annals of Epidemiology* 25:96–100.

Kapur N, While D, Blatchley N, Bray I & Harrison K 2009. Suicide after leaving the UK armed forces—a cohort study. *PLOS Medicine* 6:e26.

Katz IR, McCarthy JF, Ignacio RV & Kemp J 2012. Suicide among veterans in 16 states, 2005 to 2008: comparisons between utilizers and nonutilizers of Veterans Health Administration (VHA) services based on data from the National Death Index, the National Violent Death Reporting System, and VHA administrative records. *American Journal of Public Health* 102:S105–S10.

Hoffmire C, Kemp JE & Bossarte RM 2015. Changes in suicide mortality for veterans and nonveterans by gender and history of VHA service use, 2000–2010. *Psychiatric Services* 66:959–65.

Tehan, the Hon. D 2017a. Joint communique: veterans' ministers meeting. 8 November. Canberra. Viewed 12 December 2017, <[http://minister.dva.gov.au/media\\_releases/2017/nov/joint\\_vmm.htm](http://minister.dva.gov.au/media_releases/2017/nov/joint_vmm.htm)>.

Tehan, the Hon. D 2017b. Launching \$6 million research centre to support veterans with PTSD. Media release by Minister for Veterans' Affairs, Minister for Defence Personnel. 15 September. Canberra. Viewed 21 November 2017, <[http://minister.dva.gov.au/media\\_releases/2017/sep/va125.htm](http://minister.dva.gov.au/media_releases/2017/sep/va125.htm)>.

Tehan, the Hon. D 2017c. Ministerial statement on veterans and their families. Media release by Minister for Veterans' Affairs, Minister for Defence Personnel. 14 August. Canberra. Viewed 21 November 2017, <[http://minister.dva.gov.au/media\\_releases/2017/aug/va110.htm](http://minister.dva.gov.au/media_releases/2017/aug/va110.htm)>.

Van Hooff M, McFarlane AC, Davies CE, Searle AK, Fairweather-Schmidt AK, Verhagen A et al. 2014. The Australian Defence Force Mental Health Prevalence and Wellbeing Study: design and methods. *European Journal of Psychotraumatology* 5:1–12.

## 5.7 Prisoners

The prison population in Australia is increasing, both in overall number and as a proportion of the population. The health profiles of prisoners are different from those of the general community; they have higher levels of mental health disorders, illicit drug use, chronic conditions, communicable disease and disability.

The prison population is fluid, with many prisoners entering and leaving prison each year. In 2015, more than 50,000 people entered prison and more than 50,000 were discharged. This constant movement through the prison system means the health issues of Australia's prisoners become health issues for the whole community.

This snapshot uses the 2015 National Prisoner Health Data Collection (NPHDC) to report on the health and demographic profile of people entering prison. Where data are available, broad comparisons are made between the health of prisoners and that of the general community.

### Who is in prison in Australia?

The prisoner population is predominantly male, with Aboriginal and Torres Strait Islander people over-represented in the prison system (Table 5.7.1).

**Table 5.7.1: Prison and general population demographics, 2016**

	Prison population	General adult population
Male	<b>9 in 10</b> (92%)	<b>1 in 2</b> (49%)
Indigenous	<b>1 in 4</b> (27%)	<b>1 in 50</b> (3.0%)

Sources: ABS 2016c, 2017b.

People entering prison are often from disadvantaged backgrounds (Table 5.7.2).

**Table 5.7.2: Prison entrants and general population socioeconomic factors, 2015–2016**

	Prison entrants, 2015	General adult population
Homeless	<b>1 in 4</b> (24%) were homeless in the month before entering prison	<b>1 in 200</b> (0.5%) were homeless on Census night, 2016
Unemployed	<b>1 in 4</b> (27%) were unemployed and looking for work in the month before entering prison	<b>1 in 25</b> (4.4%) aged 15 and over were unemployed and looking for work in February 2015
Education level	<b>2 in 3</b> (68%) had an education level of Year 10 or below	<b>1 in 5</b> (21%) aged 15–74 had an education level of Year 10 or below in May 2015

Note: Comparisons should be interpreted with caution due to differences in age structure, age intervals and time periods between the prison population and the general population data.

Sources: ABS 2015b, 2016b, 2018; AIHW 2015.

# What do we know about the health of Australia's prisoners?

People entering prison are likely to have mental and physical health problems, and behave in ways that are risky to their health (Table 5.7.3).

**Table 5.7.3: Prison entrants and general population health conditions, 2014–2016**

	<b>Prison entrants, 2015</b>	<b>General adult population</b>
Mental health condition	<b>1 in 2</b> (50%) reported a history of a mental health condition	<b>1 in 5</b> (19%) aged 18–54 reported a long-term mental or behavioural health condition in 2014–15
Chronic health condition	<b>1 in 3</b> (31%) reported a current chronic health condition	<b>1 in 5</b> (22%) aged 18–54 reported a current chronic health condition in 2014–15
Hepatitis C	<b>1 in 3</b> (31%) tested positive to hepatitis C	<b>1 in 50</b> (1.9%) aged 18–54 were estimated to be living with chronic hepatitis C in 2015
Current smoker	<b>3 in 4</b> (74%) were current smokers	<b>1 in 6</b> (16%) aged 18 and over were current smokers in 2016
Used illicit drugs	<b>2 in 3</b> (67%) had used illicit drugs during the 12 months before entering prison	<b>1 in 5</b> (19%) aged 18 and over reported using illicit drugs during the 12 months before being surveyed in 2016

*Notes*

1. Chronic health conditions reported by prison entrants included arthritis, asthma, diabetes, cancer and cardiovascular disease only, whilst chronic health conditions in the general population also included chronic respiratory conditions, chronic musculoskeletal conditions and mental health conditions.
2. Where possible, an age range of 18–54 in the general population was used for health comparisons as the vast majority of prison entrants were aged under 55 with only 2.4% aged 55 and over.
3. Comparisons should be interpreted with caution due to differences in age structure, age intervals and time periods between the prison population and the general population data.

*Sources:* ABS 2015c, 2015a, 2016b; AIHW 2015, 2017; Kirby Institute 2016.

Compared with people living in Australian households from the same age group, people entering prison are more likely to have disability—meaning that they have core activity limitation in one or more of the areas of self-care, mobility and communication. Core activity limitation for people entering prison is:

- 1.1 times as likely as for people living in Australian households for people aged 20–34
- 1.5 times as likely for people aged 35–49
- 1.3 times as likely for people aged 50–64 (ABS 2016a).

As most people entering prison in the 50–64 age group are aged under 55, the comparison for this age group likely underestimates the limitation that older prisoners have compared with people of the same age in the general population.

## The prison population is ageing

The Australian prison population is growing faster than the Australian population, with older prisoners the fastest growing age group (ABS 2017a). The number of prisoners aged 50 and over increased by 84%—from 2,400 prisoners in 2005 to 4,400 in 2015—and by 170% for prisoners aged 65 and over—312 prisoners in 2005 to 842 in 2015 (ABS 2005b, 2015d). This substantial increase compares with a 27% increase in the Australian population aged 50 and over between 2005 and 2015 and a 34% increase in the number of Australians aged 65 and over (ABS 2005a, 2015a).

The steep rise over time in the number of older prisoners is due to a few reasons: long prison sentences, mandatory sentencing, sentencing of historical sex offenders, reduced options for early release and the decline in preventable deaths over time (AIC 2015; Baidawi et al. 2011; Trotter & Baidawi 2015).

### How healthy are older prisoners?

Older people, including older prisoners, are more likely to suffer from chronic conditions and disability, and need medication, treatment and support with daily living, compared with younger people.

Prisoners experience 'accelerated ageing', where signs of ageing occur 10 to 15 years earlier than for the rest of the population (Baidawi et al. 2011; Williams et al. 2012). For this reason, 50 years is commonly used as the threshold for considering a prisoner in Australia to be 'old' (Trotter & Baidawi 2015).

As well as being more likely to have core activity limitation, people entering prison aged 50 and over often have other health conditions, reportedly brought to their attention by a doctor or nurse. For instance:

- 1 in 3 (33%) reported being told they had arthritis
- 2 in 11 (18%) reported being told they had diabetes
- 1 in 6 (16%) reported being told they had cardiovascular disease
- 1 in 18 (5.5%) reported being told they had cancer.

### What is missing from the picture?

The NPHDC aims to collect data from all public and private prisons in Australia on people who enter prison, prisoners who visit a prison clinic, prisoners who are taking prescription medication while in custody, prison clinic services and staffing levels, and prisoners discharged from prison. Currently, data are collected every 3 years through surveys conducted in prisons over a 2-week period. In 2015, the response rate for people entering prison was 49% and included prisoners from 84% of prisons in Australia. The AIHW is working with all jurisdictions to improve the completeness of this data collection. Data linkage can improve the understanding of prisoner outcomes and pathways through the health system and is being explored by AIHW in collaboration with the Australian Bureau of Statistics.

Longitudinal data on individual prisoners' health—that is, from prison entry to release—are not currently available. Likewise, data on the continuity of care after prisoners leave the prison health system are not available.

## Where do I go for more information?

More information on the health of Australia's prisoners, including information on the use of prison health services by people in prison and information on people being discharged from prison, is available at: <[www.aihw.gov.au/reports-statistics/population-groups/prisoners/overview](http://www.aihw.gov.au/reports-statistics/population-groups/prisoners/overview)>.

The report *The health of Australia's prisoners, 2015* and other recent releases are available for free download.

Information on prisoners in Australia is also available at <[www.abs.gov.au/ausstats/abs@.nsf/mf/4517.0](http://www.abs.gov.au/ausstats/abs@.nsf/mf/4517.0)>.

## References

- ABS (Australian Bureau of Statistics) 2005a. Australian demographic statistics, Jun. 2005. ABS cat. no. 3101.0. Canberra: ABS.
- ABS 2005b. Prisoners in Australia, 2005. ABS cat. no. 4517.0. Canberra: ABS.
- ABS 2015a. Australian demographic statistics, Jun. 2015. ABS cat. no. 3101.0. Canberra: ABS.
- ABS 2015b. Education and work, Australia, May 2015. ABS cat. no. 6227.0. Canberra: ABS.
- ABS 2015c. National Health Survey: first results, 2014–15. ABS cat. no. 4364.0.55.001. Canberra: ABS.
- ABS 2015d. Prisoners in Australia, 2015. ABS cat. no. 4517.0. Canberra: ABS.
- ABS 2016a. Microdata: disability, ageing and carers, Australia, 2015. ABS cat. no. 4430.0.30.002. Canberra: ABS. AIHW analysis of Basic Confidentialised Unit Record File.
- ABS 2016b. Participation, job search and mobility, Australia, February 2015. ABS cat. no. 6226.0. Canberra: ABS.
- ABS 2016c. Prisoners in Australia, 2016. ABS cat. no. 4517.0. Canberra: ABS.
- ABS 2017a. Australian demographic statistics, Dec. 2016. ABS cat. no. 3101.0. Canberra: ABS.
- ABS 2017b. Census of population and housing: reflecting Australia - stories from the Census, 2016. ABS cat. no. 2071.0. Canberra: ABS.
- ABS 2018. Census of population and housing: estimating homelessness, 2016. ABS cat. no. 2049.0. Canberra: ABS.
- AIC (Australian Institute of Criminology) 2015. Deaths in custody in Australia: National Deaths in Custody Program 2011–12 and 2012–13. Canberra: AIC.
- AIHW (Australian Institute of Health and Welfare) 2015. The health of Australia's prisoners 2015. Cat. no. PHE 207. Canberra: AIHW.
- AIHW 2017. National Drug Strategy Household Survey 2016: detailed findings. Drug Statistics series no. 31. Cat. no. PHE 214. Canberra: AIHW.
- Baidawi S, Turner S, Trotter C, Browning C, Collier P, O'Connor D et al. 2011. Older prisoners—a challenge for Australian corrections. *Trends and Issues in Crime and Justice* 426.
- Kirby Institute 2016. National blood-borne viruses and sexually transmissible infections surveillance and monitoring report, 2016. Sydney: Kirby Institute, University of New South Wales.
- Trotter C & Baidawi S 2015. Older prisoners: challenges for inmates and prison management. *Australian and New Zealand Journal of Criminology* 48:200–18.
- Williams BA, Goodwin JS, Baillargeon J, Ahalt C & Walter LC 2012. Addressing the aging crisis in US criminal justice health care. *Journal of the American Geriatrics Society* 60:1150–6.





# Chapter 6

## Indigenous health



## 6.0 Overview

Aboriginal and Torres Strait Islander people are the Indigenous peoples of Australia. Indigenous Australians can be of Aboriginal origin, Torres Strait Islander origin, or both. There were an estimated 787,000 Indigenous Australians in 2016—3.3% of the total Australian population, with an estimated growth in their population size of 19% since 2011. This chapter presents information on the health status of the Indigenous population, as well as the determinants of health and access to health services that are specific to the Indigenous population.

For Indigenous Australians, good health is more than the absence of disease or illness; it is a holistic concept that includes physical, social, emotional, cultural, spiritual and ecological wellbeing, for both the individual and the community. This concept of good health emphasises the connectedness of these factors and recognises how social and cultural determinants can affect health.

As a group, Indigenous Australians experience widespread disadvantage and health inequality. In 2014–15, Indigenous Australians were at almost half as likely as non-Indigenous Australians to rate their health as 'fair' or 'poor', and much less likely to rate their health as 'excellent' or 'very good'. Compared with non-Indigenous Australians, Indigenous Australians are 1.7 times as likely to have disability or a restrictive long-term health condition and 2.7 times as likely to experience high or very high levels of psychological distress.

The gap in life expectancy between Indigenous and non-Indigenous Australians in 2010–2012 was around 10.6 years for males and 9.5 years for females. Health inequality can start early for Indigenous people—reflected in infant and child mortality rates being generally higher in their communities. Further, although rates have declined in recent years, Indigenous children are 2.1 times as likely as non-Indigenous children to die before the age of 5.

Indigenous children and adolescents are also far more likely than non-Indigenous children to be affected by ear infections and hearing loss. Although the proportion of Indigenous children with poor ear health and hearing loss has decreased in the last 15 years, the rate of long-term ear/hearing problems in children aged 0–14 is still almost 3 times that for non-Indigenous children (8.4% compared with 2.9%). Poor ear and hearing health can profoundly affect a child's life, impeding cognitive development, auditory processing skills and speech and language development. Hearing loss can lead to social isolation and problems with school attendance, which, in turn, can have life-long negative social consequences. For many Indigenous children, hearing loss and the associated aftermaths further compound many of the disadvantages already facing Indigenous Australians.

Much of the understanding of the 'health gap' between Indigenous and non-Indigenous Australians is based on factors generally recognised as contributing to good health, including:

- differences in the social determinants of health—Indigenous Australians, on average, have lower levels of education, employment, income, and poorer quality housing than non-Indigenous Australians
- differences in health risk factors—Indigenous Australians, on average, have higher rates of risk factors that can lead to adverse health outcomes, such as tobacco smoking, risky alcohol consumption and insufficient physical activity for good health
- differences in access to appropriate health services—Indigenous Australians are more likely than non-Indigenous Australians to report greater difficulty in accessing affordable health services that are close by.

Socioeconomic factors account for more than one-third (34%) of this health gap—household income is the largest individual contributor to the overall gap (14%), followed by employment status (12%). Health risk factors contribute 19% of the gap—with differences in smoking rates between Indigenous and non-Indigenous Australians being the largest contributor, at 10%. While the Indigenous smoking rate has fallen substantially in recent years—from 51% in 2002 to 42% in 2014–15—it is still 2.7 times as high as that for non-Indigenous Australians.

Access to appropriate, high-quality and timely health care can help to improve health outcomes. Indigenous Australians can use mainstream or Indigenous-specific primary health care services. In 2015–16, Indigenous primary health care services were delivered across nearly 370 sites, more than two-thirds of which were in *Very remote* (33%), *Remote* (13%) and *Outer regional* (23%) areas.

The geographic distribution of the Indigenous population can pose substantial challenges for workforce recruitment and delivery of health services. For example, access to midwives is critical for the health of Indigenous women, who are less likely to attend antenatal care in the first trimester of pregnancy, and have higher levels of social disadvantage. These factors contribute to the higher likelihood that babies born to Indigenous mothers will be premature, of low birthweight and/or will die before their first birthday. Looking at the supply of midwives across Australia, 15% of Indigenous women of child-bearing age live in areas likely to pose the highest challenges for supply of a midwife workforce. This percentage is 8 times as high as that for non-Indigenous women of child-bearing age (1.8%).

# 6.1 Profile of Indigenous Australians

Aboriginal and Torres Strait Islander people are the Indigenous peoples of Australia. They comprise hundreds of groups, each with their own distinct set of languages, histories and cultural traditions. Indigenous communities pass on knowledge, tradition, ceremony and culture from one generation to the next through language, performance, protection of significant sites, storytelling and the teachings of Elders. Indigenous Australians live in all parts of the nation, from major cities to remote tropical and desert areas.

The Australian Government defines Indigenous Australians as people who are of Aboriginal or Torres Strait Islander descent, who identify as being of Aboriginal or Torres Strait Islander descent and who are accepted as such in the communities in which they live, or have lived. In most data collections, a person's Indigenous status is based on the first two parts of this definition. While there is evidence that Aboriginal and Torres Strait Islander people are more likely to identify as Indigenous now than in the past, there is still under-counting of Indigenous Australians in official statistics. The Australian Bureau of Statistics takes the Census counts (the number of people who identified as Indigenous) and adjusts the data to produce the estimated resident population data (ERP) and this snapshot uses ERP data where possible.

## How many people identify as Indigenous?

In 2016, an estimated 787,000 Australians identified as Indigenous (3.3% of the population). Between 2011 and 2016, the estimated Indigenous population increased by 19%, compared with an 8.0% increase for the non-Indigenous population (ABS 2017a). These are preliminary estimates, with the final ERP estimates to be released later in 2018. In 2016, 91% of people identifying as Indigenous were of Aboriginal origin, 5.0% were of Torres Strait Islander origin and 4.1% identified as being of both Aboriginal and Torres Strait Islander origin (ABS 2017a).

### Where do Indigenous Australians live?

In 2011,



**35%** lived in *Major cities*—  
233,100 people



**22%** lived in *Inner regional areas*—147,700 people



**22%** lived in *Outer regional areas*—146,100 people

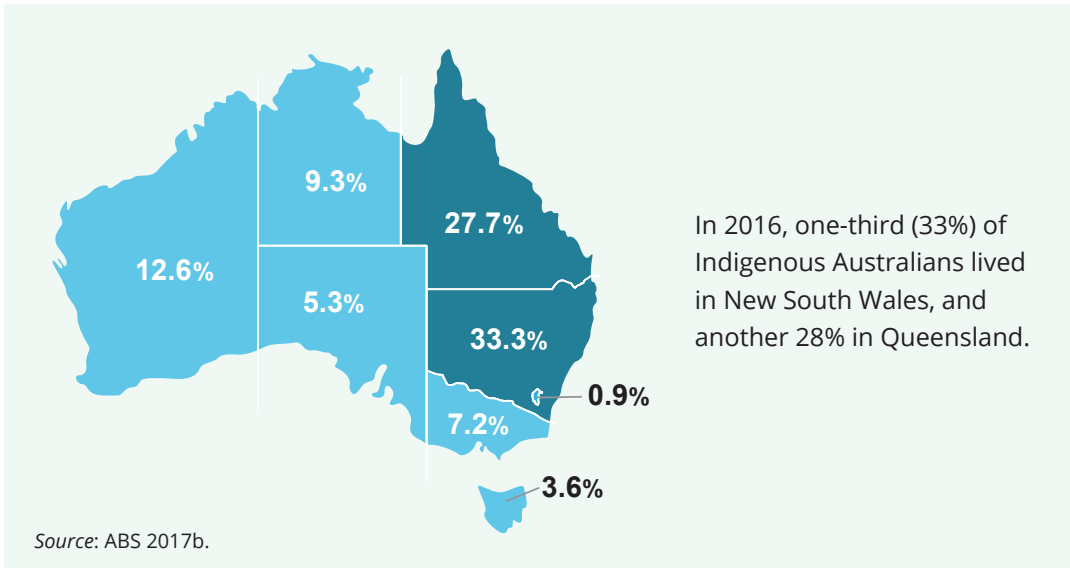


**7.7%** lived in *Remote areas*—51,300 people



**14%** lived in *Very remote areas*—91,600 people

Source: ABS 2013.

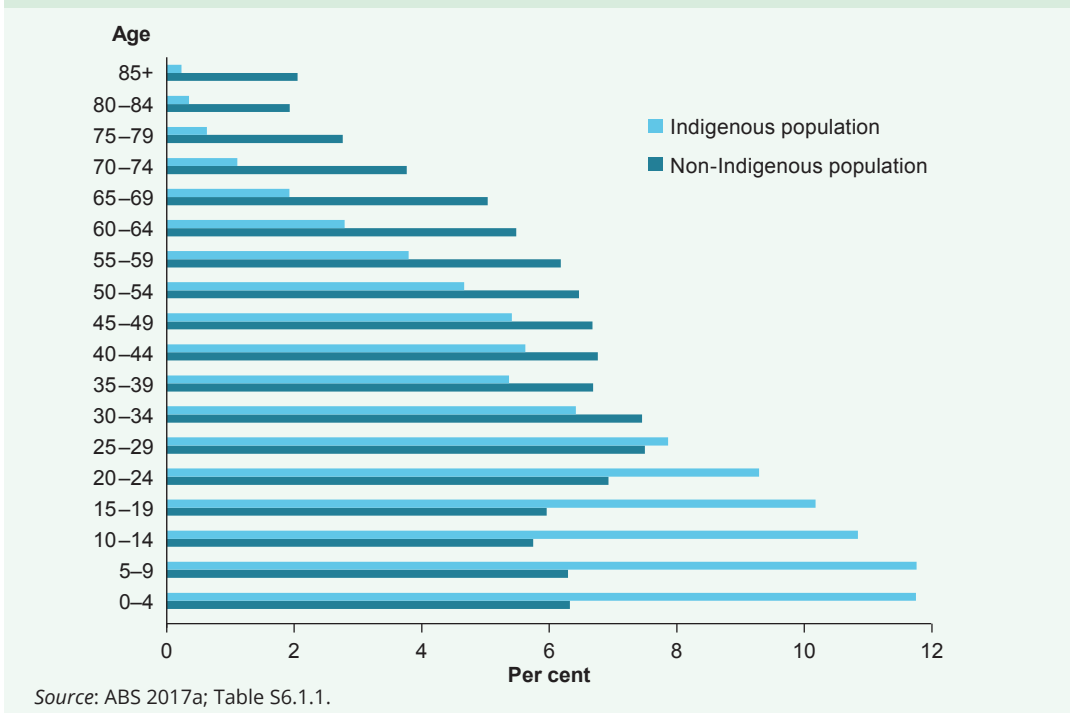


## Age profile

The Indigenous population has a much younger age distribution than the non-Indigenous population. The median age of the Indigenous population in the 2016 Census was 23, compared with 38 for the non-Indigenous population (ABS 2017c).

In 2016, 34% of Indigenous Australians were aged under 15, compared with 18% of non-Indigenous Australians, and only 4.3% of Indigenous Australians were aged 65 and over (Figure 6.1.1).

Figure 6.1.1: Population distribution, by age and Indigenous status, 2016



## Household composition

In 2016, Indigenous households were more likely to be made up of families, and less likely to be lone-person households than non-Indigenous households (Table 6.1.1).

**Table 6.1.1: Percentage distribution of household composition, by Indigenous status, 2016**

Household composition	Indigenous	Non-Indigenous
One family	74.7	69.2
Multiple families	5.1	1.8
Lone person	14.7	24.7
Group	5.5	4.2

Source: ABS 2017c.

## Language

The 2016 Census reported that:

- one in 10 (10%) Indigenous people spoke an Indigenous language at home
- 150 different Australian Indigenous languages were spoken at home
- 85% of the 63,800 Indigenous people who spoke an Indigenous language at home reported speaking English well or very well (ABS 2017d).

## Social and economic capital

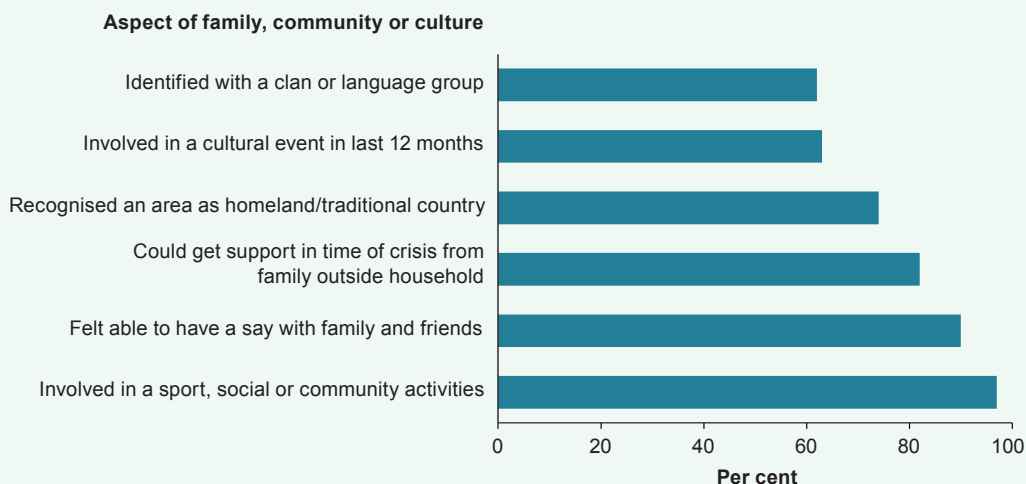
In 2016:

- the employment-to-population ratio among people aged 15 and over (employment rate) for Indigenous Australians was 45%
- 12% of Indigenous households owned their homes outright, another 26% owned with a mortgage, and the majority (57%) rented their dwellings
- median equivalised household income for Indigenous Australians was \$1,203
- the proportion of Indigenous people aged 20–24 who had completed Year 12 or its equivalent increased by more than a third between 2011 and 2016, from 37% to 47% (ABS 2017d).

## Family and cultural life

Data from the 2014–15 National Aboriginal and Torres Strait Islander Social Survey show that Indigenous Australians have strong connections to family, community and culture (Figure 6.1.2).

**Figure 6.1.2: Percentage distribution of participation in aspects of family and cultural life, Indigenous Australians, 2014–15**



Source: ABS 2016; Table S6.1.2.

## What is missing from the picture?

Changes in Indigenous identification rates between Censuses can affect population counts and the statistics derived from them. Due to the small Indigenous population in some jurisdictions and remoteness areas, it is not always possible to produce specific, reliable statistics for smaller areas. Detailed information on cultural factors and participation is only available every 3 years from Indigenous-specific surveys.

## Where do I go for more information?

Find more information on the composition of the Indigenous population on the Australian Bureau of Statistics website at [www.abs.gov.au/Aboriginal-and-Torres-Strait-Islander-Peoples](http://www.abs.gov.au/Aboriginal-and-Torres-Strait-Islander-Peoples).

An overview of reports and statistics about Indigenous Australians is available from the AIHW website at [Indigenous Australians](#).

## References

ABS (Australian Bureau of Statistics) 2013. Estimates of Aboriginal and Torres Strait Islander Australians, June 2011. ABS cat. no. 3238.0.55.001. Canberra: ABS.

ABS 2016. National Aboriginal and Torres Strait Islander Social Survey, 2014–15. ABS cat. no. 4714.0. Canberra: ABS.

ABS 2017a. Australian demographic statistics, Mar. 2017. ABS cat. no. 3101.0. Canberra: ABS.

ABS 2017b. Census of Population and Housing—counts of Aboriginal and Torres Strait Islander Australians, Australia, 2016. ABS cat. 2075.0. Canberra: ABS.

ABS 2017c. Census of Population and Housing: reflecting Australia—stories from the Census, 2016. ABS cat. no. 2071.0. Canberra: ABS.

ABS 2017d. 2016 Census of Population and Housing—Aboriginal and Torres Strait Islander peoples profile. ABS cat. no. 2002.0. Canberra: ABS.

## 6.2 Indigenous health and wellbeing

For Aboriginal and Torres Strait Islander Australians, good health is more than just the absence of disease or illness; it is a holistic concept that includes physical, social, emotional, cultural, spiritual and ecological wellbeing, for both the individual and the community. This concept of health emphasises the connectedness between these factors and recognises the impact that social and cultural determinants have on health.

This snapshot presents information on three aspects of health and wellbeing for the Indigenous population, drawn from the 2014–15 National Aboriginal and Torres Strait Islander Social Survey: perceived health status, disability and long-term health conditions, and social and emotional wellbeing—each of which fits within the Indigenous definition of health. See chapters 6.3 'Indigenous child mortality and life expectancy', 6.4 'Ear health and hearing loss among Indigenous children' for more information on other health outcomes.

### Perceived health status

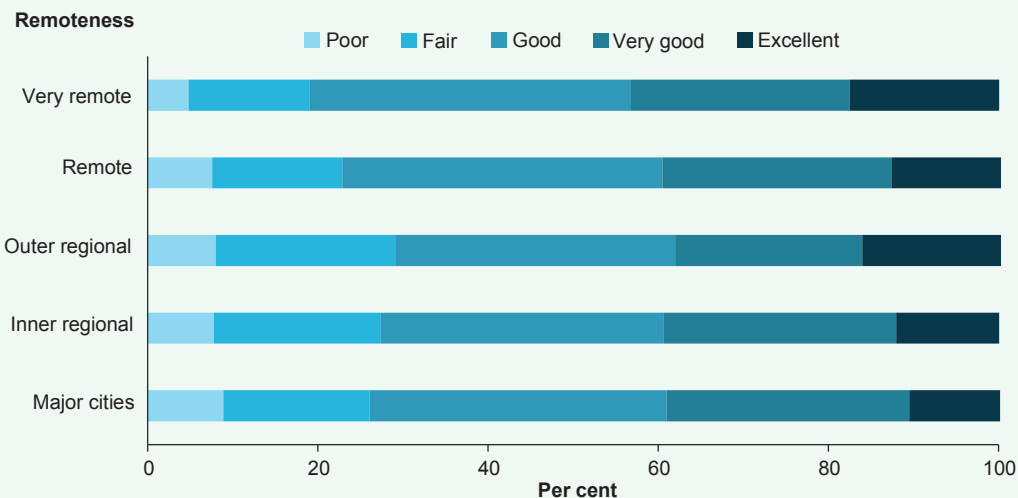
One way to measure health is to ask people how good or how poorly they rate their current health. Self-assessed health status is a subjective measure that depends on an individual's expectations for their own health and their comparisons with others around them (Delpierre et al. 2009).

In 2014–15, an estimated 40% of Indigenous Australians aged 15 and over rated their health as 'excellent' or 'very good', 35% as 'good' and 26% as 'fair' or 'poor' (ABS 2016). Indigenous males were more likely to rate their health as 'excellent' or 'very good' than Indigenous females (43% compared with 37%). Indigenous parents rated the health of their children aged 0–14 positively in 2014–15: 83% rated it as 'excellent' or 'very good', 13% as 'good', and 4.0% as 'fair' or 'poor'.

Self-assessed health status varies across remoteness areas; Indigenous Australians living in *Very remote* and *Remote* areas were less likely to rate their health as 'fair' or 'poor' than Indigenous Australians in regional areas or *Major cities* (Figure 6.2.1).



**Figure 6.2.1 Self-assessed health status for Indigenous Australians, by remoteness area, 2014–15**



Source: ABS 2016; Table S6.2.1.

The patterns for both sex and remoteness differ from those for more objective measures of health—such as hospitalisations or health risk factors, where men and people living in more remote areas have higher rates. These differences may arise because perceptions of one’s own health status may incorporate broader aspects of health, including social and emotional wellbeing and functioning. Thus, subjective and objective measures should be viewed as complementary indicators of health.

In 2014–15, Indigenous Australians were at least twice as likely as non-Indigenous Australians to rate their health as ‘fair’ or ‘poor’, and almost half as likely to rate their health as ‘excellent’ or ‘very good’. These differences have changed little since 2008 (ABS 2016).

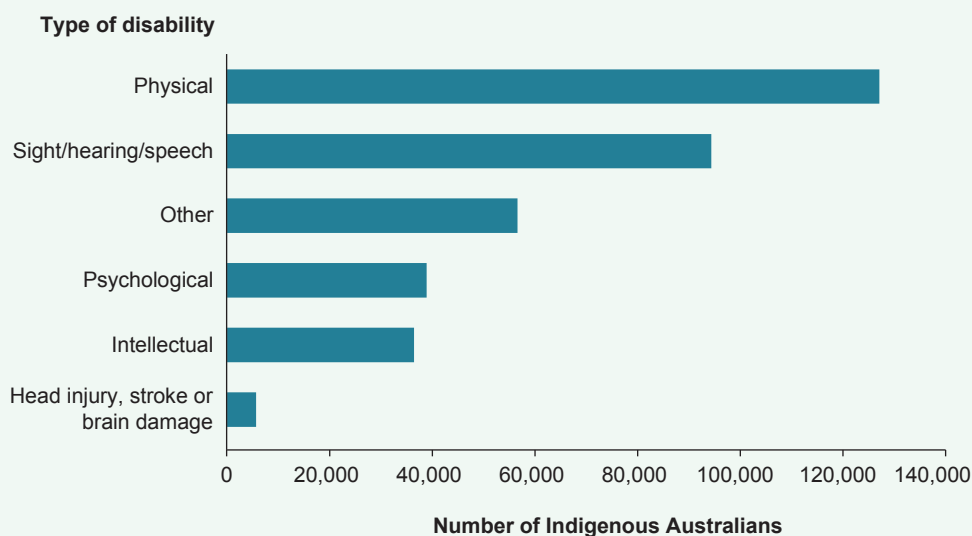
## Disability status and long-term health conditions

On average, people living with disability or long-term health conditions have substantially poorer health than people living without disability.

In 2014–15, an estimated 45% of Indigenous Australians (almost 200,000 people) had disability or a long-term health condition that restricted their everyday activities, at 1.7 times the rate of non-Indigenous Australians (ABS 2016). Physical disability was the type most often reported in 2014–15, followed by sight/hearing/speech disability (Figure 6.2.2).

The long-term health conditions with the highest self-reported prevalence among Indigenous Australians in 2014–15 were eye diseases and vision problems (29%), respiratory diseases (24%), musculoskeletal diseases (22%) and cardiovascular disease (16%) (ABS 2016).

Figure 6.2.2: Type of disability, Indigenous Australians, 2014–15



*Note:* As people can have multiple forms of disability, the numbers add up to more than the total 199,764 reporting a disability or long-term health condition.

*Source:* ABS 2016; Table S6.2.2.

## Social and emotional wellbeing

Two related indicators of social and emotional wellbeing are the extent to which people experience stressors in their lives, and their levels of psychological distress.

In 2014–15, more than two-thirds (68%) of Indigenous Australians had experienced one or more stressors in the last 12 months; the stressors reported most often were the death of a family member or close friend (28%), inability to get a job (18%), serious illness (12%) and mental illness (10%) (ABS 2016).

While the majority of Indigenous Australians report low or very low levels of psychological distress (67%), one-third (30%) experience high or very high levels of psychological distress (2014–15). These levels are 2.7 times as high as those for non-Indigenous Australians (11%, 2012–13 data). Indigenous Australians who had experienced at least one stressor were 1.9 times as likely to report high/very high levels of psychological distress as Indigenous Australians who had not experienced a stressor (36% compared with 19%) (ABS 2016).

### What is missing from the picture?

Information on the many dimensions of health for Indigenous Australians comes mainly from survey data, which is collected only every 3 to 6 years (depending on the measure). Because of small numbers, it is difficult to produce estimates for small geographic areas. There is also a lack of longitudinal data, which would enhance our ability to examine the determinants of positive and negative health outcomes for cohorts of people.

## Where do I go for more information?

The AIHW reports *Australian Burden of Disease Study: impact and causes of illness and death in Aboriginal and Torres Strait Islander people 2011*, and *The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples 2015*, are available for free download from the AIHW website. For more detailed data see the supplementary online tables from the [Aboriginal and Torres Strait Islander Health Performance Framework](#).

## References

ABS (Australian Bureau of Statistics) 2016. National Aboriginal and Torres Strait Islander Social Survey, 2014–15. ABS cat. no. 4714.0. Canberra: ABS.

Delpierre C, Lauwers-Cances V, Datta G, Lang T & Berkman L 2009. Using self-rated health for analysing social inequalities in health: a risk for underestimating the gap between socioeconomic groups? *Journal of Epidemiology and Community Health* 63:426–32.

## 6.3 Indigenous child mortality and life expectancy

Child mortality and life expectancy are widely used as overall indicators of population health. Although Australia's national child mortality rates are low and life expectancy is high compared with that of other countries, there are significant disparities in both these measures between Aboriginal and Torres Strait Islander people and non-Indigenous Australians. In 2008, the Council of Australian Governments (COAG) committed to halving the gap in child (ages 0–4) mortality rates within 10 years (2018) and closing the gap in life expectancy between Indigenous and non-Indigenous Australians within a generation (by 2031).

### Child mortality

The latest available data from the jurisdictions with acceptable levels of Indigenous identification in their mortality data (New South Wales, Queensland, Western Australia, South Australia and the Northern Territory) show that, in 2016, 113 Indigenous children aged 0–4 and 726 non-Indigenous children aged 0–4 died, yielding:

- a child death rate of 146 per 100,000 for Indigenous children and 70 per 100,000 for non-Indigenous children
- a gap of 76 deaths per 100,000 children
- a rate ratio of 2.1 (that is, Indigenous children were 2.1 times as likely to die during early childhood as non-Indigenous children) (AIHW 2018).

To meet the Closing the Gap target and halve the gap in child mortality rates by 2018, a reduction of at least 26 deaths (across the jurisdictions with available data combined) is required between 2016 and 2018. Achieving this goal begins with understanding the age distribution and causes of death underpinning these patterns.

### Age distribution of Indigenous child deaths

The risk of dying during early childhood varies by age, with deaths during the first year of life making up 82% of all Indigenous child deaths and 84% of all non-Indigenous child deaths. There is a great deal of variation across the first year, with 40% of Indigenous infant deaths and 42% of non-Indigenous infant deaths occurring on the first day of life (Table 6.3.1).

**Table 6.3.1: Percentage distribution of infant deaths, by age at death and Indigenous status, NSW, Qld, WA, SA and the NT combined, 2011–2015**

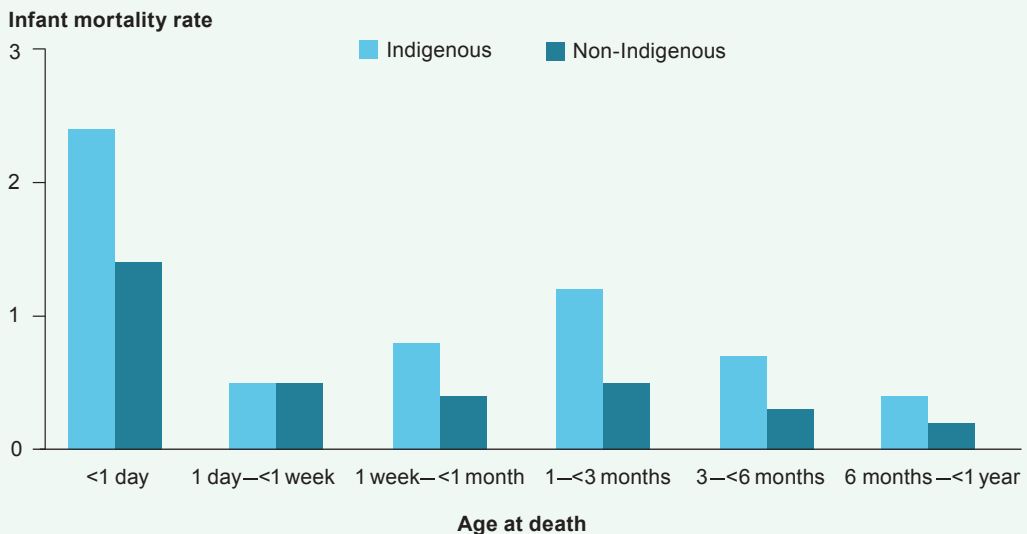
Age at death	Indigenous	Non-Indigenous
<1 day	40.0	42.0
1 day – 1 week	8.8	15.9
1 week – 1 month	13.2	13.0
1–3 months	19.8	14.3
3–6 months	11.6	8.1
6 months – 1 year	6.6	6.6
<b>Number of infant deaths</b>	<b>500</b>	<b>3,393</b>

*Note:* Deaths registered in 2012 and earlier are based on the final version of cause of death data; deaths registered in 2013 are based on revised data; deaths registered in 2014 and 2015 are based on preliminary cause of death data. Revised and preliminary data are subject to further revision by the Australian Bureau of Statistics.

*Source:* National Mortality Database.

Infant mortality rates (which measure the risk of dying) for these age groups show that Indigenous infants are 3 times as likely as non-Indigenous infants to die between 1 and 6 months of age, and twice as likely to die for all other age categories (except for 1 day–1 week, where the risks are equal) (Figure 6.3.1).

**Figure 6.3.1: Infant deaths per 1,000 live births, by age at death and Indigenous status, 2011–15 (NSW, Qld, SA, WA and the NT combined)**



*Note:* Deaths registered in 2012 and earlier are based on the final version of cause of death data; deaths registered in 2013 are based on revised data; deaths registered in 2014 and 2015 are based on preliminary cause of death data. Revised and preliminary data are subject to further revision by the Australian Bureau of Statistics.

*Source:* National Mortality Database.

The age distribution of child deaths is related to the cause-of-death distribution.

## Causes of death responsible for the child mortality gap

Three causes of death accounted for 85% of the gap in child mortality rates between Indigenous and non-Indigenous children aged 0–4 in 2011–15: pregnancy/birth-related conditions (40% of the gap); sudden infant death syndrome (SIDS) and other unknown causes (26%); and accidents, injuries and other external causes (18%) (Supplementary Table S6.3.2).

These causes are not randomly distributed throughout infancy and early childhood but are related to the age of the child (Supplementary Table S6.3.3). Data from 2011–15 show that during the first month of life, pregnancy/birth-related conditions were responsible for 78% of Indigenous infant deaths (241 babies). Between 1 and 3 months, SIDS and other unknown causes were the leading cause of death, responsible for 89 Indigenous infant deaths (47% of Indigenous deaths in this age group). Accidents, injuries and other external causes were responsible for the highest proportion of Indigenous child deaths between ages 1–4 (59 deaths; 54% of all Indigenous child deaths in this age group).

## Opportunities for improvement

The factors underlying the higher infant and child mortality rates for Indigenous children are complex; they include higher rates of preterm birth and low birthweight, higher rates of maternal smoking during pregnancy, poorer pre-pregnancy maternal health, higher levels of social disadvantage, poorer access to antenatal and birthing services, and higher likelihood of living in overcrowded housing (AHMAC 2017; AIHW 2014).

Analyses of the child mortality data show that there are three targeted areas with potential to improve outcomes for Indigenous infants and young children:

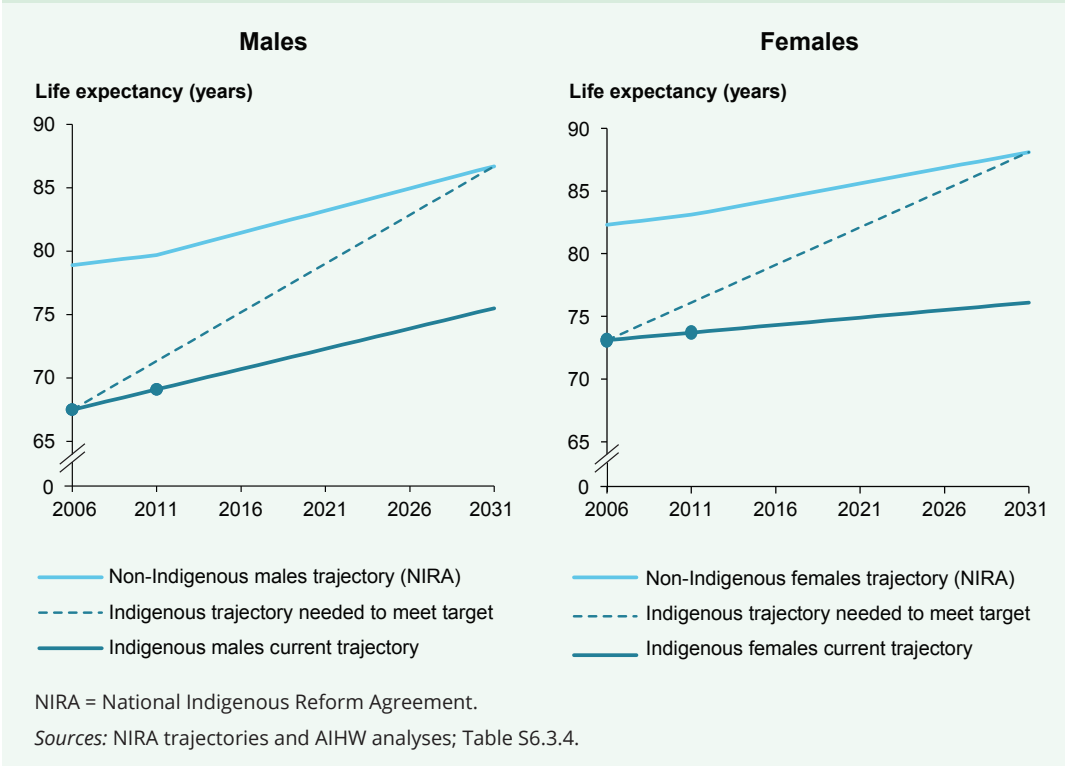
- reducing preterm births
- reducing tobacco smoking
- reducing SIDS and sleep-related deaths (see AIHW 2018 for more detail).

## Life expectancy

In 2010–2012, life expectancy at birth for Indigenous Australians was estimated to be 69.1 years for males and 73.7 years for females. By comparison, the life expectancy at birth for non-Indigenous Australians was 79.7 years for males and 83.1 years for females.

Between 2005–2007 and 2010–2012, the gap in life expectancy between Indigenous and non-Indigenous Australians decreased from 11.4 to 10.6 years for males, and from 9.6 to 9.5 years for females. Although the life expectancy of Indigenous Australians is slowly improving, the current rate of progress indicates that the COAG target will not be met by 2031. Meeting the target is made more challenging as non-Indigenous life expectancy is expected to increase over the coming years (PM&C 2016). Including the projected gains in non-Indigenous life expectancy, in order to close the gap there would need to be a 15–19 year increase in Indigenous life expectancy in the 25-year period from 2006 to 2031 (Figure 6.3.2).

Figure 6.3.2: Trajectories of life expectancy at birth, by sex and Indigenous status, 2006–2031



## What is missing from the picture?

Indigenous deaths data are reported for only five jurisdictions (New South Wales, Queensland, Western Australia, South Australia and the Northern Territory) and may not reflect the national picture. The other jurisdictions have lower levels of identification and a small number of Indigenous deaths.

There is also a need for improved capture of factors in the pre-conception, pregnancy, birth and early childhood periods that may influence childhood mortality outcomes—for example, diet and nutrition, exposure to stress, psychological distress, domestic violence, alcohol use during pregnancy, breastfeeding, immunisation, and sleep-related behaviours.

## Where do I go for more information?

See the AIHW reports *Closing the Gap targets: analysis of progress and key drivers of change* and *Timing impact assessment for COAG Closing the Gap targets: child mortality* for more information.

## References

- AHMAC (Australian Health Ministers' Advisory Council) 2017. Aboriginal and Torres Strait Islander Health Performance Framework 2017 report. Canberra: AHMAC.
- AIHW (Australian Institute of Health and Welfare) 2014. Timing impact assessment of COAG Closing the Gap targets: Child mortality. Cat. no. IHW 124. Canberra: AIHW.
- AIHW 2018. Closing the Gap targets: 2017 analysis of progress and key drivers of change. Cat. no. IHW 193. Canberra: AIHW.
- PM&C (Department of the Prime Minister and Cabinet) 2016. Closing the Gap Prime Minister's report. Canberra: PM&C.

## 6.4 Ear health and hearing loss among Indigenous children

Ear disease and associated hearing loss are highly prevalent among Aboriginal and Torres Strait Islander children. Hearing loss may result from genetic causes, complications at birth, certain infectious diseases, chronic ear infections, use of certain medicines, injuries and accidents, exposure to loud noise, and ageing. Worldwide, 60% of childhood hearing loss is due to preventable causes (WHO 2017).

Otitis media is the key condition contributing to hearing loss among Indigenous children, and it is treatable and preventable (Burns & Thomson 2013). Otitis media is the inflammation of the middle ear, typically caused by bacterial and viral pathogens that also cause common childhood illnesses (Burns & Thomson 2013). Infections can present themselves in various ways, including as acute infections (which can be recurrent), the presence of middle ear fluid without the usual signs of infection, or as chronic infections with persistent discharge (Kong & Coates 2009). Short-lasting mild to moderate hearing loss is common during uncomplicated otitis media (Williams & Jacob 2009). Hearing loss is greater and lengthier in chronic and complicated infections (O'Connor et al. 2009) and can become long term or permanent unless corrected by surgery. Generally, otitis media incidence is highest in children aged 6–24 months and then again in children aged 4–5 years (Burns & Thomson 2013).

The clinical presentation of otitis media infections differs for Indigenous and non-Indigenous children. Otitis media is characterised in Indigenous children by a younger age at first episode, higher frequency of infection, greater severity and greater persistence than in non-Indigenous children (Jervis-Bardy et al. 2017). Repeated ear infections, which are often undiagnosed and untreated, are substantially and significantly associated with hearing problems at a later stage (Yiengprugsawan et al. 2013). Between the ages of 2 and 20, an Indigenous child or young person is likely to experience hearing loss from middle ear infections for at least 32 months, compared with 3 months for non-Indigenous children/young people (Kong & Coates 2009).

Studies have consistently shown that ear disease is more common in Indigenous children (AIHW 2014) than in non-Indigenous children. In 2011, the rate of burden (measured using disability-adjusted life years—DALYs) from hearing loss in Indigenous children aged 0–14 was 12 times as high as for non-Indigenous children (69.4 and 5.6 DALYs per 1,000, respectively). Similarly, the rate of burden from otitis media in Indigenous children was 8.6 times as high as for non-Indigenous children (41.9 and 4.9 DALYs per 1,000, respectively). Several studies have found that Indigenous children living in remote areas experience higher rates of severe and persistent ear infections than their urban counterparts (AHMAC 2017).



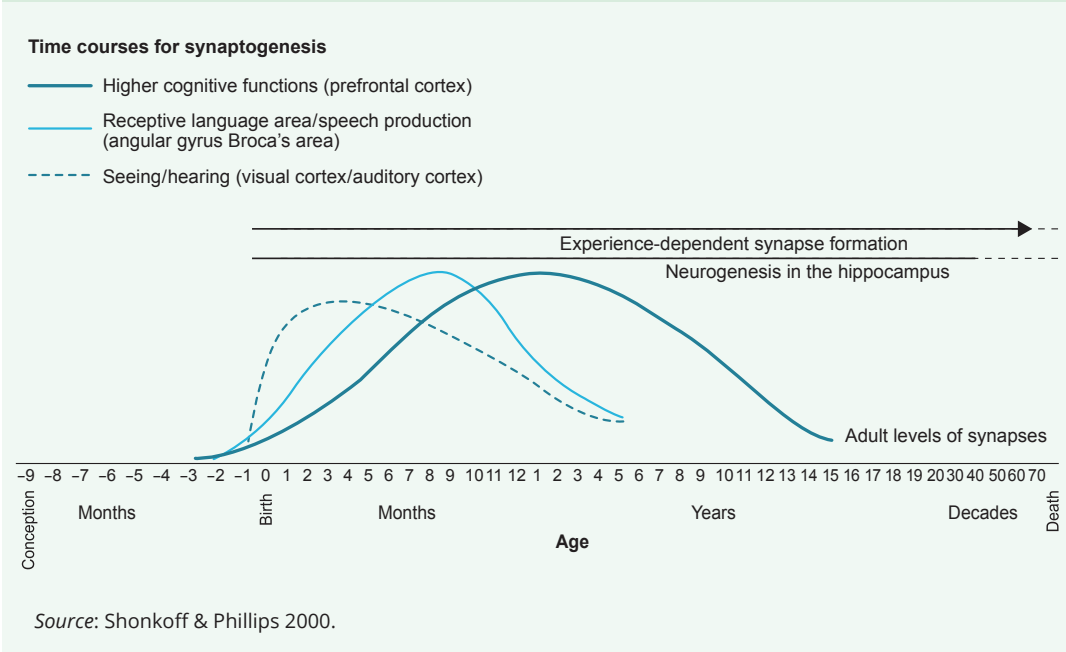
# Impact of poor hearing health

Poor ear and hearing health is a serious problem, which can profoundly affect a child's life. Figure 6.4.1 shows that the key developmental period for language, vision, hearing and higher cognitive functioning occurs during the first few years of life and extends into adolescence. Higher rates of hearing loss associated with otitis media for Indigenous children aged 6–24 months and 4–5 years overlaps with this important developmental period (Burns & Thomson 2013).

Poor hearing can impede cognitive development, auditory processing skills, and speech and language development, resulting in poor attention and listening (Burns & Thomson 2013; Burrow et al. 2009; Williams & Jacob 2009). Hearing loss can also have an impact on social and emotional wellbeing. It can lead to behavioural problems, such as irritability and disobedience, which in turn, can lead to social isolation, problems with school attendance and early school-leaving (Burrow et al. 2009).

These compounding problems can lead to life-long negative social consequences for the child, as well as for their family and community—for example, limited employment options and income, increased antisocial behaviours, and increased contact with the criminal justice system (Burns & Thomson 2013; Burrow et al. 2009). Therefore, for many Indigenous children, hearing loss and its associated consequences further compound many of the disadvantages already facing Indigenous Australians.

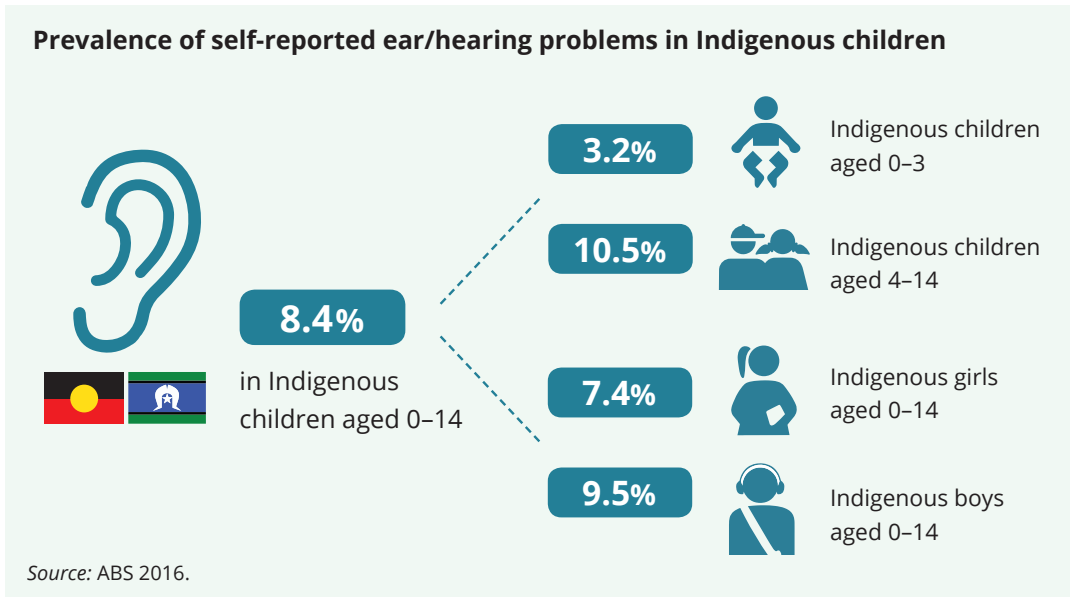
**Figure 6.4.1: Human brain development throughout the lifespan**



# How common is poor ear health and hearing loss?

This section refers to a number of national surveys (self-reported data) described previously (AIHW 2014). Self-reported surveys are likely to underestimate hearing loss as respondents can be unaware of the extent of their own or their child's hearing loss, particularly in mild cases (AIHW 2016).

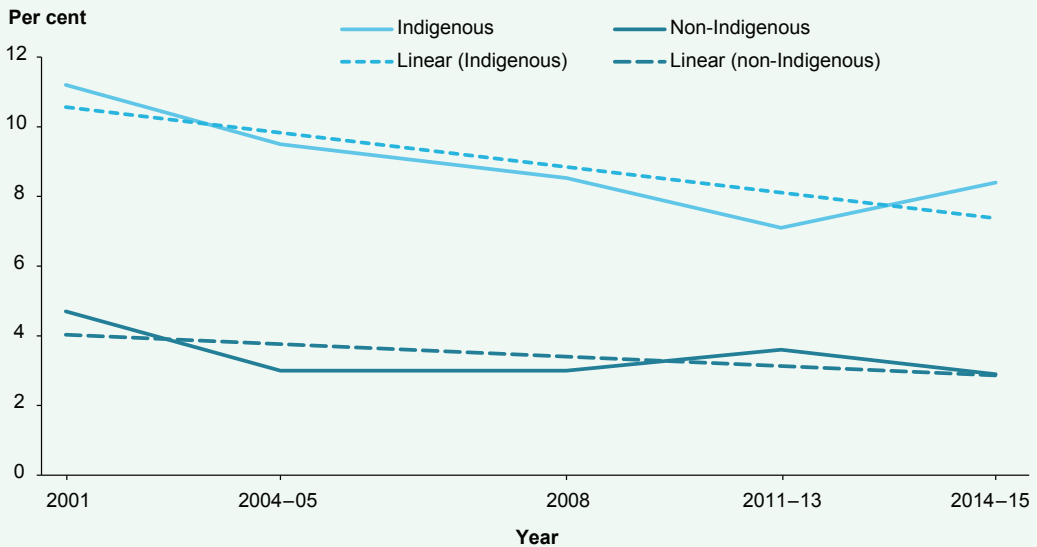
Based on self-reported data from the Australian Bureau of Statistics 2014–15 National Aboriginal and Torres Strait Islander Social Survey, the rate of long-term ear/hearing problems in Indigenous children aged 0–14 was estimated to be almost 3 times the rate for non-Indigenous children (8.4% compared with 2.9%) (ABS 2016; see also Figure 6.4.2). Among Indigenous children with ear/hearing problems, one-third had otitis media (ABS 2016). Self-reported ear/hearing problems were less common among Indigenous children aged 0–3 (3.2%) than among children aged 4–14 (10.5%), and 9.5% of Indigenous boys and 7.4% of girls reported ear/hearing problems (ABS 2016).



Self-reported Australian Bureau of Statistics survey data collected in 2014–15 show that fewer Indigenous and non-Indigenous children experienced long-term ear/hearing problems than in 2001.

The gap in self-reported prevalence of long-term ear/hearing problems between Indigenous and non-Indigenous children has narrowed (Figure 6.4.2). Self-reported ear/hearing problems for Indigenous children living *Remote/Very remote* areas was 18% in 2001, and 11% in 2014–15. Among Indigenous children in non-remote areas, the percentage was 11% in 2001 and 8.4% in 2014–15 (ABS 2016).

**Figure 6.4.2: Children aged 0–14 with a self-reported long-term hearing problem, by Indigenous status, 2001 to 2014–15**



Source: ABS 2016; Table S6.4.1.

The extent of poor ear health among Indigenous children and young people in the Northern Territory corroborated problems identified during the Child Health Check Initiative (CHCI) introduced under the Northern Territory Emergency Response (NTER). Data for the CHCI showed that between July 2007 and June 2009, of the 9,400 Indigenous children who received health checks in NTER Prescribed Areas, 30% had ear disease. In response, the Australian Government funded outreach ear and hearing services through various funding arrangements, via the National Partnership on Northern Territory Remote Aboriginal Investment (Box 6.4.1).

**Box 6.4.1: Northern Territory Remote Aboriginal Investment (NTRAI) Hearing Health Program (HHP) for remote children**

In 2016, of the 2,300 children and young people (aged 0–19) reached by the NTRAI HHP, nearly half (47%, 1,068) had some form of otitis media; of these children and young people, nearly three-quarters (71%, 759) had observed hearing loss. Two-thirds (65%) of all children aged 0–2 in the program had otitis media, with 53% of them having hearing loss. Fifty-nine per cent (59%) of children aged 3–5 had otitis media, with 78% of the group experiencing hearing loss (AIHW 2017b).

Data collections for the NTRAI HHP have some limitations: children and young people who receive services are not a random sample of Indigenous children in the Northern Territory, because these services target children with high need (AIHW 2017b).

# Factors associated with poor hearing health

## Social and economic factors

Several social and economic factors are associated with the presence of middle ear disease among Indigenous children. A study using the Australian Early Development Census (AEDC)—which examined the relationship between socioeconomic position and hearing loss in both Indigenous and non-Indigenous children—found that socioeconomic position was strongly associated with hearing loss in Indigenous children, but not in non-Indigenous children. A potential contributing factor is the higher likelihood of Indigenous children living in remote locations, which is associated with a lower socioeconomic position, and as such, decreased access to health services (Simpson et al. 2017).

Other studies have found that ear disease and hearing loss are typically found in children experiencing socioeconomic disadvantage (AHMAC 2017; Burns & Thomson 2013). Factors associated with socioeconomic disadvantage that increase the risk of otitis media for Indigenous children include premature birth, not being breastfed and nutritional deficiencies (Burns & Thomson 2013; Burrow et al. 2009; Kong & Coates 2009).

## Environmental factors

Environmental factors are another key determinant of ear/hearing problems. Children are more likely to have ear/hearing problems if they have been exposed to household overcrowding, poor hygiene, and inadequate access to running water or functioning sewerage and waste removal systems (AHMAC 2017; Burns & Thomson 2013). These factors are strongly associated with remoteness (Simpson et al. 2017).

Second-hand tobacco smoke and exposure to wood smoke also contribute to increased risk of otitis media (Burns & Thomson 2013; Burrow et al. 2009). In 2014–15, 57% of Indigenous children aged 0–14 lived in households where there was at least one daily smoker. This figure decreased from 68% in 2004–05, but is still 2.7 times the rate for non-Indigenous children (21%) (ABS 2016). In 2014–15, 13% of Indigenous children lived in households in which someone smoked inside. Survey data from 2014–15 reported that 17% of Indigenous children in remote areas lived in households in which someone smoked inside, compared with 13% in non-remote areas (ABS 2016).

The 2014–15 Aboriginal and Torres Strait Islander Social Survey data were used to examine self-reported hearing loss by different social, economic and environment factors. The data show that the percentage of hearing problems among Indigenous children who lived in:

- the most socioeconomically disadvantaged households was 9.1%, compared with 6.3% among Indigenous children living in the least socioeconomically disadvantaged households
- overcrowded households was 10%, compared with 7.7% among Indigenous children living in non-crowded households
- households with a regular indoor smoker was 9.8%, compared with 8.2% among Indigenous children living in households that did not have a regular indoor smoker (ABS 2016).

## Barriers to health care

Limited access to health care can result in delayed diagnosis, treatment and management of middle ear disease among Indigenous children, and therefore prolong periods of hearing loss and impairment (AIHW 2017b). Indigenous children wait longer than the recommended time to see an audiologist and/or ear, nose and throat (ENT) surgeon. Research has shown that 1 in 5 (18%) Indigenous children in rural and remote areas waited longer than the recommended period of 3 months for audiology testing (Gunasekera et al. 2009; Simpson et al. 2017).

In 2014–15, of those children with an ear/hearing problem, 83% had received treatment such as medication, surgery, or consultation with a specialist (ABS 2016). More than 1 in 4 (26%) Indigenous children who had an ear or hearing problem but did not receive treatment lived in *Remote* areas compared with 14% of children in non-remote areas (ABS 2016).

Limited access to primary health care has been associated with factors that include poor health awareness in carers (who do not know when children should receive health care), inadequate health care infrastructure in remote areas, or a lack of culturally appropriate services. Specialist care is limited in remote areas (Burns & Thompson 2013).

Department of Health guidelines recommend training of health care practitioners, together with efforts to increase awareness of clinical guidelines to ensure Indigenous children who attend primary health care are appropriately screened or treated for otitis media and hearing loss. Indigenous child health checks provide opportunity for detection, antibiotic treatment, follow-up assessment and referral to speech and audiology services. It is also important that primary health care providers are able to diagnose and treat chronic otitis media, as well as to work with audiologists and specialist ENT surgeons to manage hearing loss and to support the child and their family or carer through intensive follow-up and management (Darwin Otitis Guidelines Group et al. 2010).

## Health services

### Primary health care

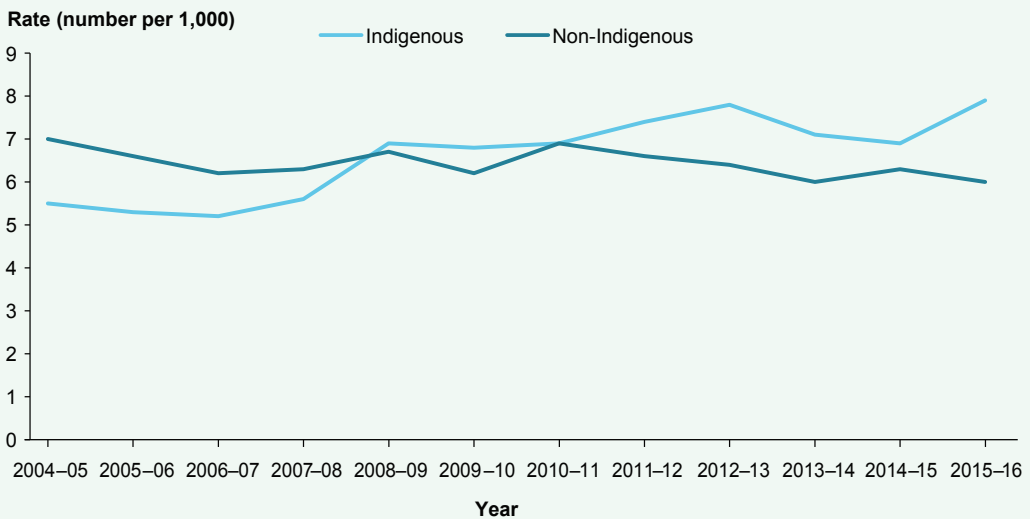
The Bettering the Evaluation and Care of Health data collection (commonly called the BEACH data collection) is a national study of general practice activity that reports on problems managed, investigations ordered and treatments provided by those general practitioners surveyed. Between 2010 and 2015, 8.4% of all problems managed by general practitioners for children aged 0–14 were ear problems. Among this cohort, Indigenous children were 30% more likely to present for ear problems than non-Indigenous children (11% and 8.9%, respectively). For children aged 5–14, Indigenous children were less likely to present for ear problems than non-Indigenous children (5.5% compared with 7.4%) (AIHW 2017a).

## Hospitalisations

Between July 2014 and June 2016, there were nearly 3,700 hospitalisations for Indigenous children (aged 0–14) for diseases of the middle ear and mastoid process. The hospitalisation rate for Indigenous children was slightly higher than for non-Indigenous children (7.4 compared with 6.4 per 1,000, respectively). The hospitalisation rate for middle ear and mastoid process problems in non-Indigenous children has remained relatively stable since 2004–05. For Indigenous children, the rate increased after 2007–08, which coincides with the NTER, and may reflect improved diagnosis and use of ear health services (Figure 6.4.3).

Hospitalisations for diseases of the middle ear and mastoid process reflect use of health services, rather than the prevalence of these conditions in the community.

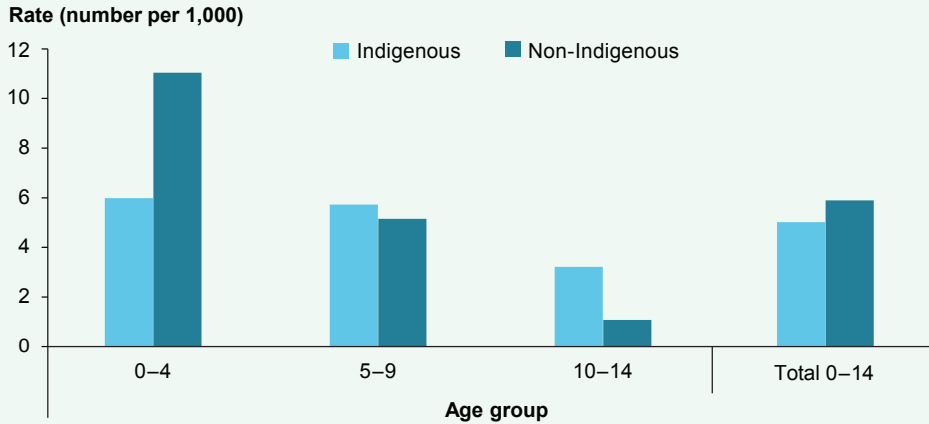
**Figure 6.4.3: Rate of hospitalisations of children aged 0–14 for diseases of the middle ear and mastoid process, by Indigenous status, 2004–05 to 2015–16**



Source: National Hospital Morbidity Database; Table S6.4.2.

*Myringotomy* (incision in the eardrum to relieve pressure caused by excessive fluid build-up) and/or *tympanoplasty* (a reconstructive surgical treatment for a perforated eardrum) are common procedures associated with diseases of the middle ear and mastoid process. Of the 3,700 hospitalisations for Indigenous children with diseases of the middle ear and mastoid process, three-quarters (76%) had *myringotomy* and/or *tympanoplasty*. Between July 2014 and June 2016, the overall rate of *myringotomy* and *tympanoplasty* procedures for children aged 0–14 was similar for Indigenous children (5.6 per 1,000) and non-Indigenous children (5.7 per 1,000) (Figure 6.4.4). However, non-Indigenous children had their procedures at relatively younger ages than Indigenous children.

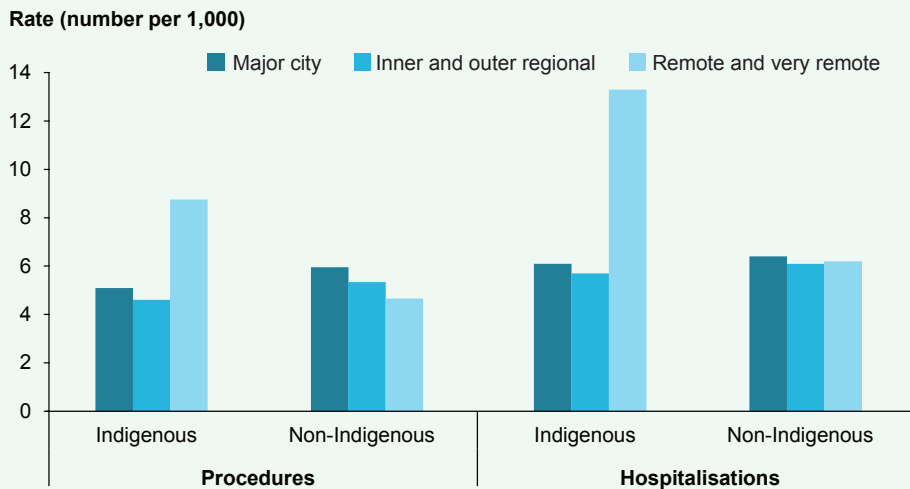
**Figure 6.4.4: Rate of middle ear related procedures for diseases of the middle ear or mastoid process in children aged 0–14, by age group and Indigenous status, 2014–16**



Source: National Hospital Morbidity Database; Table S6.4.3.

Non-Indigenous children in *Major cities* and regional areas were more likely to have procedures in hospital for the middle ear compared with Indigenous children living in the same remoteness areas. However, in *Remote* and *Very remote* areas, Indigenous children were almost twice as likely as non-Indigenous children to have hospital procedures for the middle ear (8.8 compared with 4.7 per 1,000 population), and 2.1 times as likely to be hospitalised for problems with the middle ear or mastoid process (13.3 compared with 6.2 per 1,000) (Figure 6.4.5). Between July 2014 and June 2016, Indigenous children were hospitalised for *tympanoplasty* procedures at 4 times the rate of non-Indigenous children.

**Figure 6.4.5: Rate of middle ear related procedures and of hospitalisations for diseases of the middle ear or mastoid process for children aged 0–14, by Indigenous status and remoteness category, 2014–16**



Source: National Hospital Morbidity Database; Table S6.4.4.

One in 10 (9.9%) children fitted with a hearing aid or cochlear implant in 2010 were Indigenous. This proportion is more than 2.5 times as high as that for non-Indigenous children requiring the same treatment (AIHW 2017a).

## Interventions and preventive actions

The proportion of Indigenous children with poor ear health and hearing loss has fallen in the last 15 years. Over that time, a range of government prevention programs aimed at decreasing the prevalence of ear disease and hearing loss have been implemented. Effective interventions and programs include:

- antibiotic treatments
- immunisation programs against *Haemophilus influenzae* type b (Hib) and *Streptococcus pneumoniae*, which help to reduce the number of otitis media episodes
- neonatal screening for early identification of congenital malformations and early intervention, enabling timely treatment and management
- routine child health checks that incorporate ear and hearing assessments, allowing for early identification, management and treatment and, if necessary, the fitting of hearing aids
- case management models of service delivery where a coordinator administers clinical care, and links children with specialist and community health services
- greater access to surgical ENT care, which involves greater coordination nationally of available resources
- Indigenous-specific clinical guidelines, which provide the basis for better management of ear disease and resultant hearing loss
- targeted screening and treatment services for ear health and hearing loss through programs such as the national Healthy Ears, Better Hearing, Better Listening Program and the hearing health element of the National Partnership on NTRAI (see Box 6.4.2) (AIHW 2014).

As well as medical interventions, attention should be given to dealing with social and economic challenges, including education strategies to combat hearing loss related to otitis media (Burrow et al. 2009). These efforts must involve the child's family, maternal and child health care providers, and be embedded in coordinated primary care systems (AIHW 2014).

### Box 6.4.2: NTRAI HHP: impact of intervention

The NTRAI HHP (see also Box 6.4.1) provides outreach ear and hearing services to high-risk Indigenous children and young people in remote parts of the Northern Territory. These services have four components—health promotion and prevention, audiology services, Clinical Nurse Specialists, and ENT teleotology services (where a clinical examination, including digital imaging of the ear, is performed and reviewed later or remotely by a specialist).

As a result of this program, hearing health and prevalence ear conditions in this population group have improved. In December 2016, compared with July 2012, the proportion of children with at least one ear disease decreased by 15%, and the proportion of children with hearing loss decreased by 10%. Of the children who moved through the HHP over time, 51% had improved hearing loss and 62% had improved hearing impairment.



## What is missing from the picture?

There is no national statistical profile of ear disease and associated hearing loss among Indigenous children using diagnostic assessment. National data are lacking on the extent of management and treatment of otitis media and other ear problems in primary health care. Without good-quality surveillance, it is difficult to understand the size and key determinants associated with the hearing problem.

The 2018–19 National Aboriginal and Torres Strait Islander Survey (NATSIHS) will include a hearing test, which will supplement data already collected in the NATSIHS on self-reported hearing loss. This aims to provide a national picture on hearing loss in Indigenous Australians but will not provide information about its causes. This survey does not sample non-Indigenous Australians.

Further work could be done to investigate the link between hearing health data (collected since 2007 as part of the CHCI in the Northern Territory) and vulnerability (using the AEDC) and educational outcomes using the National Assessment Program—Literacy and Numeracy data.

## Where do I go for more information?

More information about hearing health in Indigenous children can be found in:

- Australian Health Ministers' Advisory Council's *Aboriginal and Torres Strait Islander Health Performance Framework 2017 report* <[www.pmc.gov.au/sites/default/files/publications/indigenous/hpf-2017](http://www.pmc.gov.au/sites/default/files/publications/indigenous/hpf-2017)>.
- AIHW's *Northern Territory Remote Aboriginal Investment: Ear and Hearing Health Program—July 2012 to June 2016* <[www.aihw.gov.au/reports/indigenous-health-welfare-services/nt-ear-hearing-program-to-2016/related-material](http://www.aihw.gov.au/reports/indigenous-health-welfare-services/nt-ear-hearing-program-to-2016/related-material)>.
- AIHW's *Aboriginal and Torres Strait Islander Health Performance Framework 2017: supplementary online tables* <[www.aihw.gov.au/reports/indigenous-health-welfare/health-performance-framework-report/data](http://www.aihw.gov.au/reports/indigenous-health-welfare/health-performance-framework-report/data)>.
- Australian Medical Association's *2017 Report card on Indigenous health—a national strategic approach to ending chronic otitis media and its lifelong impacts in Indigenous communities* <[www.ama.com.au/system/tdf/documents/2017%20Report%20Card%20on%20Indigenous%20Health.pdf?file=1&type=node&id=47575](http://www.ama.com.au/system/tdf/documents/2017%20Report%20Card%20on%20Indigenous%20Health.pdf?file=1&type=node&id=47575)>.

## References

ABS (Australian Bureau of Statistics) 2016. National Aboriginal and Torres Strait Islander Social Survey, 2014–15. ABS cat. no. 4714.0. Canberra: ABS.

AHMAC (Australian Health Ministers' Advisory Council) 2017. Aboriginal and Torres Strait Islander Health Performance Framework 2017 report. Canberra: AHMAC.

AIHW (Australian Institute of Health and Welfare) 2014. Ear disease in Aboriginal and Torres Strait Islander children. Resource sheet no. 35 produced by the Closing the Gap Clearinghouse. Canberra: AIHW.

AIHW 2016. Australian Burden of Disease Study: impact and causes of illness and death in Aboriginal and Torres Strait Islander people 2011. Australian Burden of Disease Study series no. 6. Cat. no. BOD 7. Canberra: AIHW.

AIHW 2017a. Aboriginal and Torres Strait Islander Health Performance Framework 2017: supplementary online tables. Cat. no. WEB 170. Canberra: AIHW.

- AIHW 2017b. Northern Territory Remote Aboriginal Investment: Ear and Hearing Health Program—July 2012 to June 2016. Cat. no. IHW 176. Canberra: AIHW.
- Burns J & Thomson N 2013. Review of ear health and hearing among Indigenous Australians. Perth: Edith Cowan University. Australian Indigenous Health/*InfoNet*. Viewed on 5 December 2017, <<http://www.healthinonet.ecu.edu.au/other-health-conditions/ear/reviews/our-review>>.
- Burrow S, Galloway A & Weisssofner N 2009. Review of educational and other approaches to hearing loss among Indigenous people. Perth: Edith Cowan University. Australian Indigenous Health/*InfoNet*. Viewed on 5 December 2017, <<http://www.healthinonet.ecu.edu.au/other-health-conditions/ear/reviews/our-review-education>>.
- Darwin Otitis Guidelines Group & Office for Aboriginal and Torres Strait Islander Health Otitis Media Technical Advisory Group 2010. Recommendations for clinical care guidelines on the management of otitis media in Aboriginal and Torres Strait Islander populations. Canberra: Department of Health. Viewed on 30 January 2018, <[www.health.gov.au/internet/main/publishing.nsf/Content/B8A6602C7714B46FCA257EC300837185/\\$File/Recommendation-for-clinical-guidelines-Otitis-Media.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/B8A6602C7714B46FCA257EC300837185/$File/Recommendation-for-clinical-guidelines-Otitis-Media.pdf)>.
- Gunasekera H, Morris PS, McIntyre P & Craig JC 2009. Management of children with otitis media: a summary of evidence from recent systematic reviews. *Journal of Paediatrics and Child Health* 45(10):554–63.
- Jervis-Bardy J, Carney AS, Duguid R & Leach AJ 2017. Microbiology of otitis media in Indigenous Australian children. *The Journal of Laryngology & Otology* 131(S2):S2–11.
- Kong K & Coates HLC 2009. Natural history, definitions, risk factors and burden of otitis media. *The Medical Journal of Australia* 191(9 Suppl):S39.
- O'Connor TE, Perry CF & Lannigan FJ 2009. Complications of otitis media in Indigenous and non-Indigenous children. *The Medical Journal of Australia* 191(9 Suppl):S60.
- Shonkoff JP & Phillips D 2000. From neurons to neighborhoods: the science of early childhood development. Committee on Integrating the Science of Early Childhood Development. Washington DC: National Academy Press.
- Simpson A, Enticott JC & Douglas J 2017. Socioeconomic status as a factor in Indigenous and non-Indigenous children with hearing loss: analysis of national survey data. *Australian Journal of Primary Health* 23(2):202–7.
- WHO (World Health Organization) 2017. Deafness and hearing loss fact sheet. Geneva: WHO. Viewed on 5 December 2017, <<http://www.who.int/mediacentre/factsheets/fs300/en/>>.
- Williams CJ & Jacobs AM 2009. The impact of otitis media on cognitive and educational outcomes. *The Medical Journal of Australia* 191(9 Suppl):S39.
- Yiengprugsawan V, Hogan A & Strazdins L 2013. Longitudinal analysis of ear infection and hearing impairment: findings from 6-year prospective cohorts of Australian children. *BioMed Central (BMC) Pediatrics* 13(1):28.

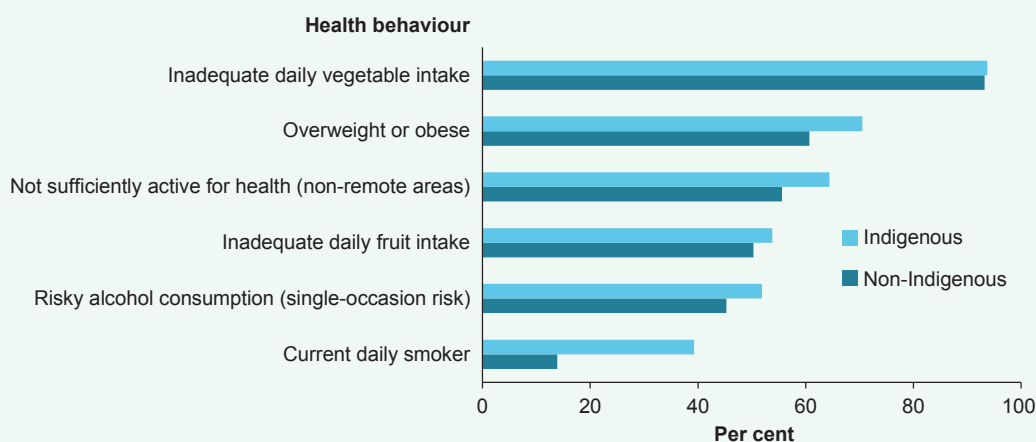
## 6.5 Health behaviours of Indigenous Australians

This snapshot provides a high-level overview of the prevalence of health risks among Aboriginal and Torres Strait Islander Australians. These risks include smoking and alcohol consumption, dietary behaviours, physical inactivity and overweight and obesity. See Chapter 4 for more information on how these risks affect health outcomes and Chapter 6.6 'Social determinants and Indigenous health' for more information on the determinants of these risks.

### Prevalence

Figure 6.5.1 presents rates of health-related behavioural risks for Indigenous and non-Indigenous Australians. Although Indigenous Australians have higher rates of risky health behaviours, these differences are small, except for tobacco smoking. In 2014–15, the rate for Indigenous Australians for tobacco smoking was 2.8 times that for non-Indigenous Australians.

**Figure 6.5.1: Age-standardised prevalence of selected health behaviours and risk factors, by Indigenous status**



*Note:* Vegetable intake, fruit intake and smoking are for 2014–15; weight, physical activity, alcohol consumption are for 2012–13.

*Sources:* ABS 2014a, 2014b, 2016. Table S6.5.1.

### Tobacco smoking

Tobacco smoking is the single most important preventable cause of ill health and death in Australia, for both Indigenous and non-Indigenous Australians. In 2014–15, around 42% of Indigenous people aged 15 and over were current smokers (186,000 current smokers).

The smoking rate for Indigenous people aged 15 and over was 2.7 times as high as for non-Indigenous adults (42% compared with 15%, age-standardised rate) (ABS 2017).

Although the gap in smoking rates remains, Indigenous people have made several improvements over time:

- Smoking rates among Indigenous Australians declined from 51% in 2002 to 42% in 2014–15. This decline was concentrated in non-remote areas, however, with little change to smoking rates in remote areas.
- The likelihood of quitting smoking has increased: in 2002, 24% of Indigenous adults who had ever smoked had successfully quit smoking. By 2014–15, this had increased to 36%.
- Fewer Indigenous young people aged 15–17 are smoking now than in the past—a drop from 30% in 1994 to 17% in 2014–15. As current smokers generally start smoking around this age, preventing uptake in this group will likely result in lower future rates of current smokers (ABS 2017).

## Alcohol consumption

A comparison of data collected in 2008 and 2014–15 indicates that there have been significant positive changes in alcohol-related behaviours among Indigenous Australians:

- In 2014–15, 40% of Indigenous people aged 15 and over reported that they either drank no alcohol during the previous 12 months or only on one occasion. This is an increase from 36% in 2008.
- In 2014–15, 31% of Indigenous people aged 15 and over reported that they drank alcohol at what is considered a risky level on at least a single occasion (known as short-term risk), compared with 38% in 2008.
- In 2014–15, 15% of Indigenous people aged 15 and over reported that they drank alcohol at lifetime risky levels, a decrease from 19% in 2008 (ABS 2016).

## Diet

According to self-reported data, in 2014–15, only 4.7% of Indigenous children aged 4–14 and 4.0% of Indigenous people aged 15 and over had an adequate daily intake of both fruit and vegetables. Among Indigenous children, 65% had an adequate daily intake of fruit and 5.5% had an adequate daily intake of vegetables. Among Indigenous adults, 46% had an adequate daily intake of fruit and 5.8% had an adequate daily intake of vegetables (ABS 2016).

## Insufficient physical activity

For an adult in a non-remote area, being sufficiently active for health is defined as having 150 minutes of physical activity over five or more sessions per week. The most recent age-standardised data on physical activity levels among Indigenous adults show that, in 2012–13, about 2 in 3 (64%) Indigenous adults aged 18 and over in non-remote areas were not sufficiently active for health; this figure is higher than the comparable rate for non-Indigenous Australians (56%) (ABS 2014a).

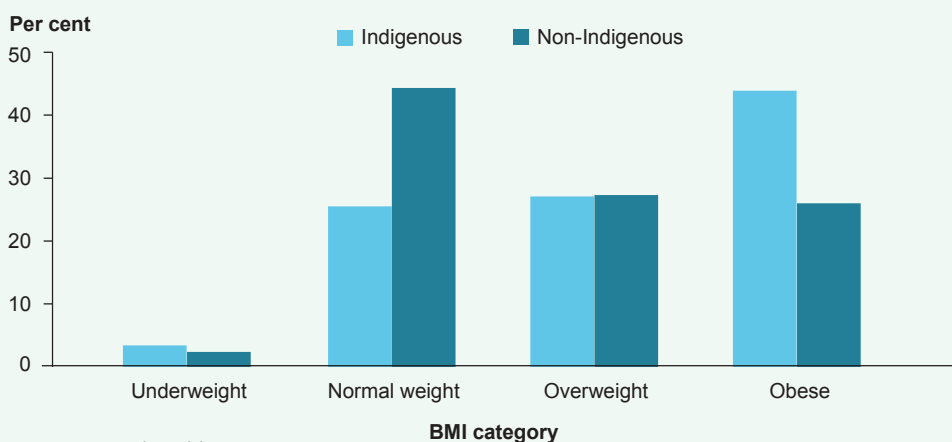
In 2014–15, around three-quarters (76%) of Indigenous children aged 4–14 were physically active for at least 60 minutes every day during the previous week (ABS 2016).

## Overweight and obesity

There are differences in weight status between Indigenous and non-Indigenous Australians, and these begin in childhood. Based on measured body mass index (BMI), in 2012–13, Indigenous girls aged 2–14 were 2.0 times as likely to be underweight (7.9% versus 3.9%) and 1.6 times as likely to be obese (9.8% versus 6.1%) as non-Indigenous girls of the same age. The patterns were similar for boys, but the difference between Indigenous and non-Indigenous boys was smaller than for girls.

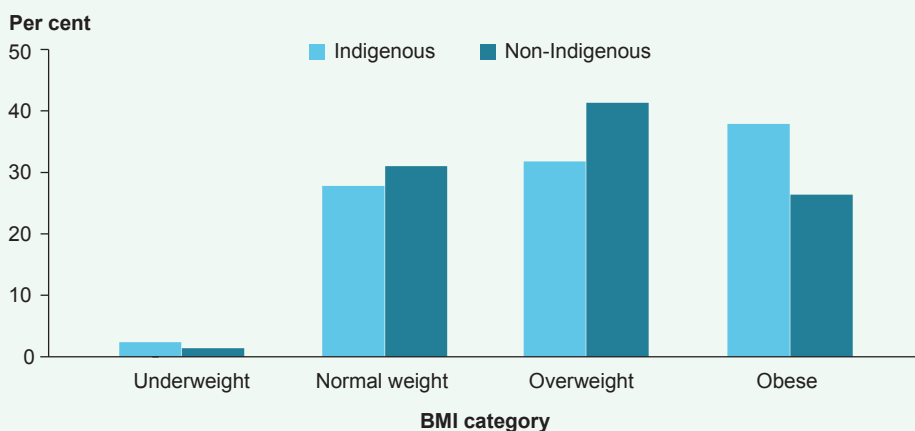
The prevalence of overweight and obesity is higher for adults than for children for both Indigenous and non-Indigenous Australians. Indigenous females are 1.7 times as likely to be obese as non-Indigenous females, while Indigenous males are 1.4 times as likely to be obese as non-Indigenous males (figures 6.5.2, 6.5.3). See Chapter 4.10 'Overweight and obesity' for more information on the growing obesity trend in Australia and an explanation of BMI measures.

**Figure 6.5.2: Proportion of females aged 15 and over in each weight (BMI) category, by Indigenous status, 2012–13**



Source: ABS 2014b, Table S6.5.2.

**Figure 6.5.3: Proportion of males aged 15 and over in each weight (BMI) category, by Indigenous status, 2012–13**



Source: ABS 2014b, Table S6.5.3.

## What is missing from the picture?

National data on behavioural risk factors relies mainly on survey data. Changes in the type of data collected, and its frequency, make it difficult to examine trends over time or between smaller geographic areas.

## Where do I go for more information?

For more details on health behaviours and biomedical risks for Indigenous Australians, see the *Australian Aboriginal and Torres Strait Islander Health Survey 2012–13* and the supplementary online tables from the *Aboriginal and Torres Strait Islander Health Performance Framework*.

## References

- ABS (Australian Bureau of Statistics) 2014a. Australian Aboriginal and Torres Strait Islander Health Survey: physical activity, 2012–13—Australia. ABS cat. no. 4727.0.55.004. Canberra: ABS.
- ABS 2014b. Australian Aboriginal and Torres Strait Islander Health Survey: updated results, 2012–13. ABS cat. no. 4727.055.006. Canberra: ABS.
- ABS 2016. National Aboriginal and Torres Strait Islander Social Survey, 2014–15. ABS cat. no. 4714.0. Canberra: ABS.
- ABS 2017. Aboriginal and Torres Strait Islander peoples: smoking trends, Australia, 1994 to 2014–15. ABS cat. no. 4737.0. Canberra: ABS.

## 6.6 Social determinants and Indigenous health

Good health is related to a complex set of underlying factors that include health behaviours, access to and use of health services, environmental factors and health endowment. These are not randomly distributed throughout society but are related to what are called the social determinants of health (see Chapter 1.1 'What is health?'; Chapter 4.2 'Social determinants of health').

Broadly, social determinants are the circumstances in which people grow, live, work and age. They can be measured by indicators that reflect an individual's own personal situation—such as their income, education, employment, and levels of social support and social inclusion. For Aboriginal and Torres Strait Islander Australians, social determinants also include factors such as cultural identity, family, participation in cultural activities and access to traditional lands (see Chapter 6.1 'Profile of Indigenous Australians').

Social determinants can also reflect the broader social and political context in which people live. This can be captured to some degree by area-level indicators of socioeconomic position, accessibility of health services, and characteristics of the built environment that promote health (including green space, playgrounds and good housing stock).

This snapshot presents examples of the relationship between selected social determinants and three aspects of Indigenous health: child health, self-assessed health status, and health behaviours. The focus is predominantly on how these social determinants help to explain variation in behaviours and outcomes among the Indigenous population.

### Social determinants and child health

The association between social determinants and child health is well established, and is evident before and during pregnancy. For example, women with higher levels of socioeconomic resources and social capital have been shown to have better pre-pregnancy health, greater access to and use of health services, better access to nutritious foods during pregnancy, more social support and better housing, and to face less income-related stress. These factors affect infant health and development, which, in turn, have lifelong effects (AIHW 2014; Behrman & Butler 2007; Burris et al 2011).

For example, babies who weigh less than 2,500 g at birth (low birthweight) are at higher risk of dying during infancy, and of having poorer long-term health and development (Arnold et al. 2016; Zhang et al. 2014). The most recent data (2015) show that 12% of babies born to Indigenous mothers were of low birthweight, a rate that is 1.9 times that of babies born to non-Indigenous mothers.

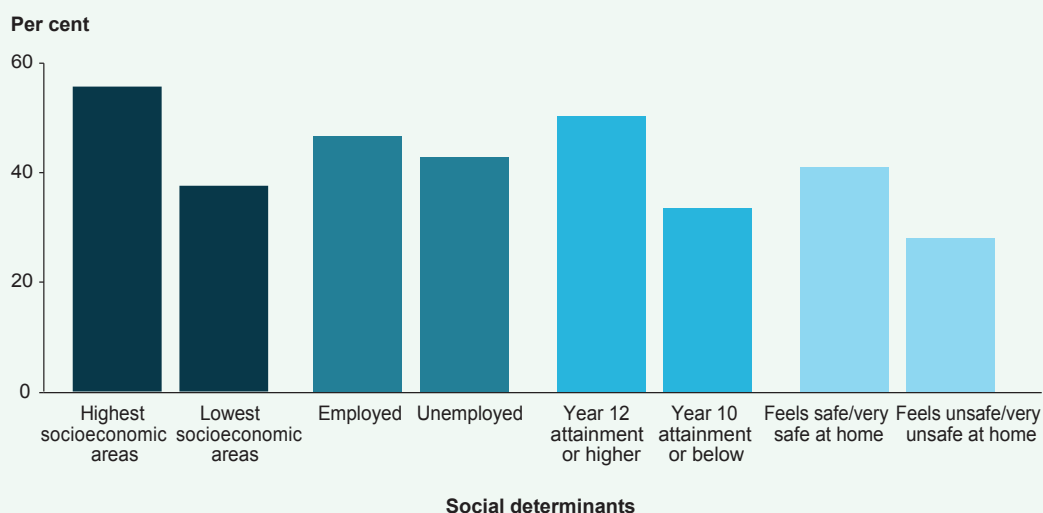


Data from the National Perinatal Minimum Data set show that nearly half (49%) of Indigenous mothers who gave birth in 2014 lived in the lowest socioeconomic areas, while only 4.0% lived in the highest socioeconomic areas. A multivariate analysis of perinatal data for 2012–2014 indicates that (excluding preterm and multiple births) 51% of low birthweight births to Indigenous mothers were attributable to smoking, compared with 16% for non-Indigenous mothers. Another 21% were attributable to the socioeconomic context of the areas in which Indigenous mothers live (as measured by the Socio-Economic Indexes for Areas). After adjusting for age differences and other factors, it was estimated that if Indigenous mothers had the same distribution across socioeconomic areas as non-Indigenous mothers, the rate of low birthweight would be reduced by 10%.

## Social determinants and self-assessed health

Indigenous Australians most likely to report very good or excellent health in 2014–15 lived in the highest socioeconomic areas, were employed, had higher educational attainment (Year 12 or higher), and felt safe or very safe alone in their homes after dark (Figure 6.6.1).

**Figure 6.6.1: Proportion of Indigenous Australians aged 15 and over reporting very good or excellent health, by selected social determinants, 2014–15**



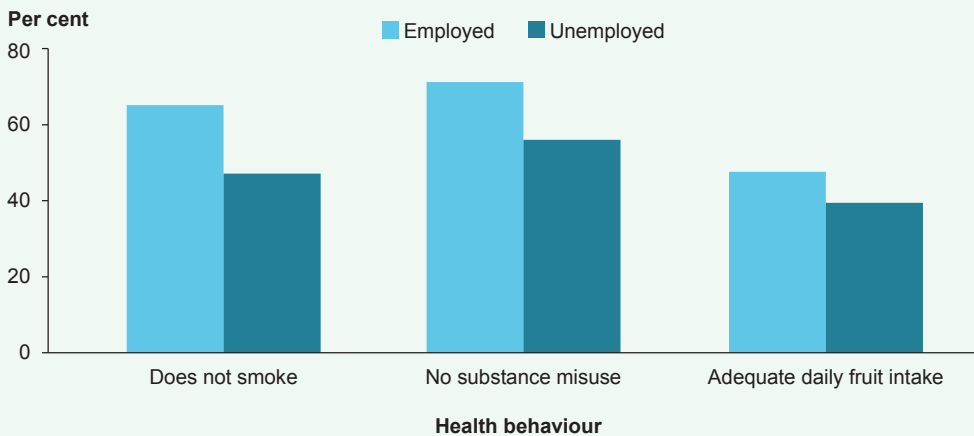
Source: ABS 2016; Table S6.6.1.

## Social determinants and health behaviours

The social gradient in health is clear in a number of health behaviours: Indigenous Australians with more social, economic and cultural advantages are more likely to engage in behaviours that promote good health. For example, Indigenous Australians who were employed in 2014–15 were less likely to smoke, less likely to use illicit substances, and more likely to have an adequate daily fruit intake than Indigenous people who were unemployed (Figure 6.6.2).



**Figure 6.6.2: Selected health behaviours by employment status, Indigenous Australians, 2014–15**



Source: ABS 2016; Table S6.6.2.

Smoking is the single most important preventable cause of ill health and death in Australia (see Chapter 6.5 ‘Health behaviours of Indigenous Australians’). Several indicators within the broad category of social determinants are associated with smoking rates among Indigenous Australians:

- Indigenous Australians in the highest two income quintiles were less likely to smoke than Indigenous people in the lowest income quintile (30% versus 56% in 2014–15).
- Indigenous adults with higher levels of educational attainment were less likely to smoke in 2014–15—28% of Indigenous people who completed year 12 smoked, compared with 51% of Indigenous people who reached Year 11 or below.
- Indigenous Australians living in the highest socioeconomic areas were less likely to smoke than Indigenous people in the lowest socioeconomic areas (18% versus 50% in 2014–15).
- Indigenous Australians who participated in organised sports were less likely to smoke than Indigenous people who did not: 32% versus 47% in 2014–15 (ABS 2016).

## What is missing from the picture?

While there is a great deal of evidence on the socioeconomic aspects of social determinants, there is less work on the other aspects of social determinants (such as social capital). As well, our ability to examine the effects of social determinants on infant health outcomes is hampered by the lack of data on key maternal factors. These factors include educational attainment, which has been shown to be a key determinant of pregnancy-related health, behaviours and infant health outcomes in other countries.

## Where do I go for more information?

More information on the social determinants of Indigenous health in Australia can be found in the *Closing the Gap targets: analysis of progress and key drivers of change* report, available at <[www.aihw.gov.au](http://www.aihw.gov.au)>.

## References

ABS (Australian Bureau of Statistics) 2016. National Aboriginal and Torres Strait Islander Social Survey, 2014–15. ABS cat. no. 4714.0. Canberra: ABS.

AIHW (Australian Institute of Health and Welfare) 2014. Timing impact assessment for COAG Closing the Gap targets: child mortality. Cat. no. IHW 124. Canberra: AIHW.

Arnold L, Hoy W & Wang Z 2016. Low birthweight increases risk for cardiovascular disease hospitalisations in a remote Indigenous Australian community—a prospective cohort study. *Australian & New Zealand Journal of Public Health* 40(S1):S102–6.

Behrman RE & Butler AS (eds) 2007. *Pre-term birth: causes, consequences, and prevention*. Institute of Medicine (US) Committee on Understanding Premature Birth and Assuring Healthy Outcomes. Washington DC: National Academies Press.

Burris HH, Collins Jr JW & Wright RO 2011. Racial/ethnic disparities in pre-term birth: clues from environmental exposures. *Current Opinion in Pediatrics* 23(2):227–32.

Zhang Z, Kris-Etherton PM & Hartman TJ 2014. Birth weight and risk factors for cardiovascular disease and type 2 diabetes in US children and adolescents: 10 year results from NHANES. *Maternal & Child Health Journal* 18(6):1423–32.

## 6.7 Size and sources of the Indigenous health gap

Employment and hours worked, household income, educational attainment and whether a person smokes explain most of the differences in health outcomes between Aboriginal and Torres Strait Islander peoples and non-Indigenous Australians.

Indigenous Australians, on average, have worse health than non-Indigenous Australians. Some measures have improved—for instance, there has been a significant decrease in mortality rates since the late 1990s, and a reduction in smoking since the early 2000s (AHMAC 2017; PM&C 2018). But on many measures, large disparities remain in health outcomes between Indigenous and non-Indigenous Australians. This is referred to as the ‘health gap’.

The extent of the health gap has been increasingly well documented. Understanding continues to grow about the many and complex factors that can influence and contribute to it (AHMAC 2017; AIHW 2014b:329–39; see also chapters 6.5 ‘Health behaviours of Indigenous Australians’, 6.6 ‘Social determinants and Indigenous health’).

A person’s health is influenced by their home, school, workplace, community and experiences of social institutions and systems (CSDH 2008). Much of the understanding of the health gap is based on observed differences between Indigenous Australians and non-Indigenous Australians of factors widely recognised as key determinants of good health (Biddle 2012; Mackenbach 2015; Marmot 2011; Shepherd et al. 2012). These differences include those in:

- social determinants of health: Indigenous Australians, on average, have lower levels of education, employment, income, and poorer quality housing than non-Indigenous Australians (AHMAC 2017; AIHW 2017)
- health risk factors: Indigenous Australians, on average, have higher rates of smoking and risky alcohol consumption, do less exercise, and have a greater risk of high blood pressure than non-Indigenous Australians (AHMAC 2017; AIHW 2017)
- access to appropriate health services: Indigenous Australians are more likely than non-Indigenous Australians to report difficulty in accessing affordable health services that are close by (AIHW 2015).

This article quantifies the main factors that contribute to the Indigenous health gap and offers a renewed opportunity to focus on policies and programs to reduce it. Solutions need to be directed to dealing with the underlying causes of poor health among Indigenous Australians throughout their lives.

The Council of Australian Governments has a number of Closing the Gap targets that aim to reduce differences in key areas between Indigenous and non-Indigenous Australians. Two of these focus on important measures of health status—life expectancy and child mortality. Currently, Indigenous Australians can be expected to live about 10 years less than non-Indigenous Australians, and Indigenous babies and children are twice as likely to die as their non-Indigenous counterparts (see Chapter 6.3 ‘Indigenous child mortality and life expectancy’).



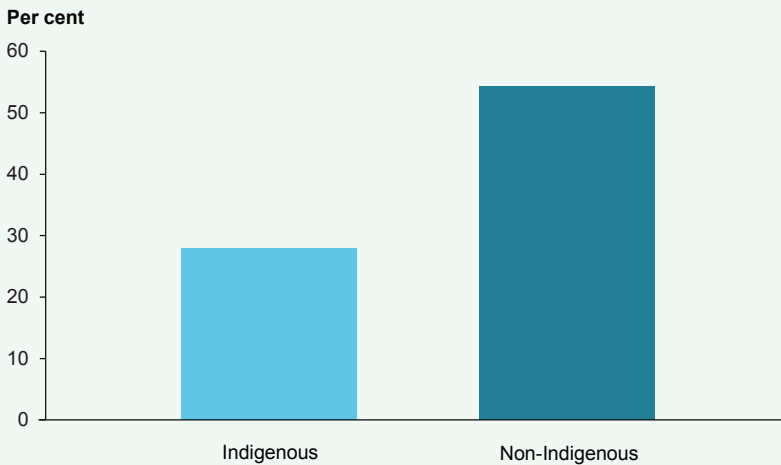
## The health gap: fewer Indigenous Australians are in 'good health'

This article examines the difference in the percentage of Indigenous and non-Indigenous adults assessed to be in 'good health', based on a composite measure of 'good health' described below and in Box 6.7.1. This gap is different from other health gaps that may be mentioned—for example, when discussing differences in life expectancy or mortality (see Chapter 6.3 'Indigenous child mortality and life expectancy') or burden of disease studies (AIHW 2016a).

In 2011–13, just under 3 in 10 (28%) Indigenous adults aged 15–64 were assessed to be in good health, compared with more than 5 in 10 (54%) non-Indigenous adults in this age group—a gap of 26 percentage points (Figure 6.7.1). After accounting for the small effects of differences in age, gender and location, this produces an adjusted health gap of nearly 27 percentage points.

This article explores how this gap arises and estimates the extent to which different social determinants and health risk factors contribute to this 27-percentage point gap (as adjusted).

**Figure 6.7.1: Proportion of people aged 15–64 assessed to be in good health, by Indigenous status, 2011–13**



Sources: AIHW analyses of ABS 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey, ABS 2011–12 Australian Health Survey; Table S6.7.1.

## How is 'good health' measured?

The measure of 'good health' used in this analysis has three components:

1. self-assessed health status
2. self-reported selected long-term health conditions (morbidity score)
3. emotional wellbeing, reflecting a person's self-reported level of distress (emotional distress score).

This combination is consistent with the World Health Organization's view of good health as 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity' (WHO 1948). The level of good health on each of these three components is shown in Figure 6.7.2.

A person is in 'good health' if they have a score of 3.0 or more on the composite measure (the calculation of the composite good health score is further explained in Box 6.7.1).

### Box 6.7.1: The composite 'good health' measure

The level of self-assessed health status in both the 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey (AATSIHS) and 2011–12 Australian Health Survey (AHS) is reported in five categories. For this analysis, these categories were assigned a score from 5 to 1, corresponding to 'excellent', 'very good', 'good', 'fair' and 'poor', respectively.

The morbidity score is based on the widely used Charlson Index (Charlson et al. 1987). It sums the number of conditions reported by a respondent but ignores the weighting factor usually associated with the severity of the condition (which was not reported in these surveys). The conditions used to generate this morbidity score include cancer; and conditions of the circulatory, respiratory, nervous, endocrine, urinary and musculoskeletal systems. The morbidity score ranged from 0 to 21.

The emotional distress score was calculated as the sum of 5 individual Kessler-5 scores, measuring how often respondents reported feeling nervous, without hope, restless or jumpy, 'everything was an effort', and 'so sad that nothing could cheer them up', in the 4 weeks before the survey. The score for each response was scaled from 0 (none of the time) to 4 (all the time), and summed over the 5 responses, resulting in emotional distress scores that ranged from 0 to 20.

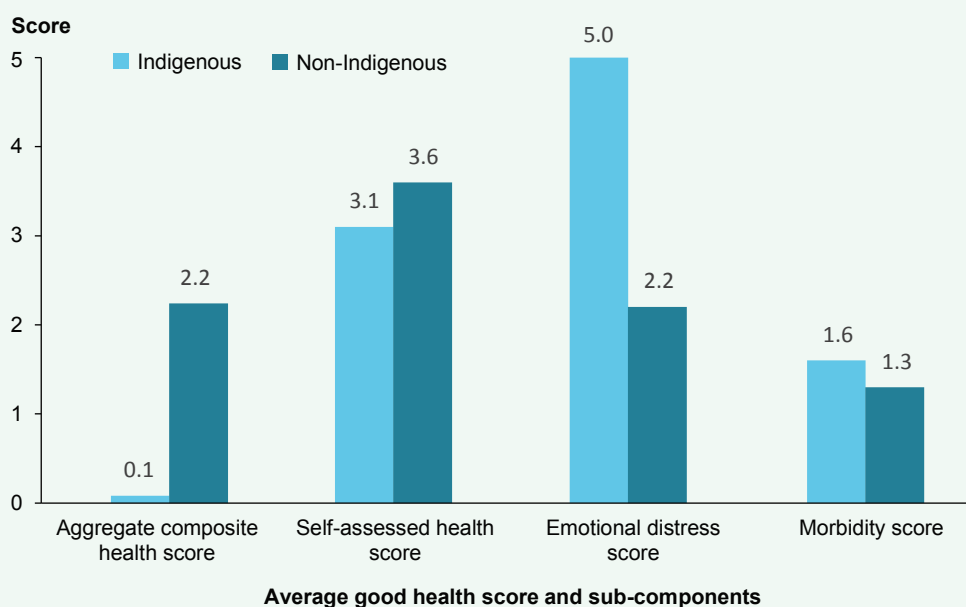
The composite health score for an individual was then calculated as follows:

$$\text{composite score} = \text{self-assessed health score} - \text{morbidity score} - \left( \frac{\text{emotional distress score} - 2}{2} \right)$$

For this analysis, a person was considered to be in good health if their score was 3.0 or higher. If they scored less than 3.0, they were considered not to be in good health. Applying a cut-off score simplifies the analysis because it creates an outcome with two possibilities: 'good health' or 'not in good health'. The chosen cut-off value of 3.0 is consistent with that of a previous AIHW (2014b:329–39) analysis.

The largest gap in the three components of the composite good health score occurs for the emotional distress score. The average emotional distress score for Indigenous adults is 5.0 while it is only 2.2 for non-Indigenous adults. The mean value of the composite health score is 0.1 for Indigenous adults and 2.2 for non-Indigenous adults (Figure 6.7.2).

**Figure 6.7.2: Average score for aggregate composite health and sub-components, by Indigenous status, 2011–13**



*Note:* These average scores are based on the actual sample of individuals used in the regression models estimated; hence, they may not be representative of the overall population of people aged 15–64 in these two surveys. Given the large number of explanatory variables used, individuals for whom any of the regression variables were missing are excluded from the estimation sample from which these average values are computed.

*Sources:* AIHW analyses of ABS 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey, ABS 2011–12 Australian Health Survey; Table S6.7.1.

The proportion of people in good health on the composite measure was calculated using data from the Australian Bureau of Statistics (ABS) 2012–13 AATSIHS for Indigenous Australians. Comparable non-Indigenous data were sourced from the ABS 2011–12 AHS. Both surveys contain detailed information on people's health outcomes and on their social determinants and health risk factors (ABS 2013, 2014).

The final sample of individuals for this analysis consisted of around 3,180 Indigenous and 8,150 non-Indigenous working-age adults (aged 15–64). This age group was chosen because some key determinants of health used in the analysis, such as hours worked, are best defined for people who have not reached the standard retirement age.

More recent AHS data are now available, but the next round of the Indigenous-specific health survey is only being conducted this year. Hence, this article uses the 2012–13 AATSIHS and 2011–12 AHS.

# More than half the gap is explained by 11 factors

Statistical analysis was used to see which factors were highly associated with good health. The results show that more than half of the health gap (53%) is explained by 11 selected factors (Figure 6.7.3). These factors were broadly classified into two groups: social determinants (5) and health risk factors (6).

## Social determinants

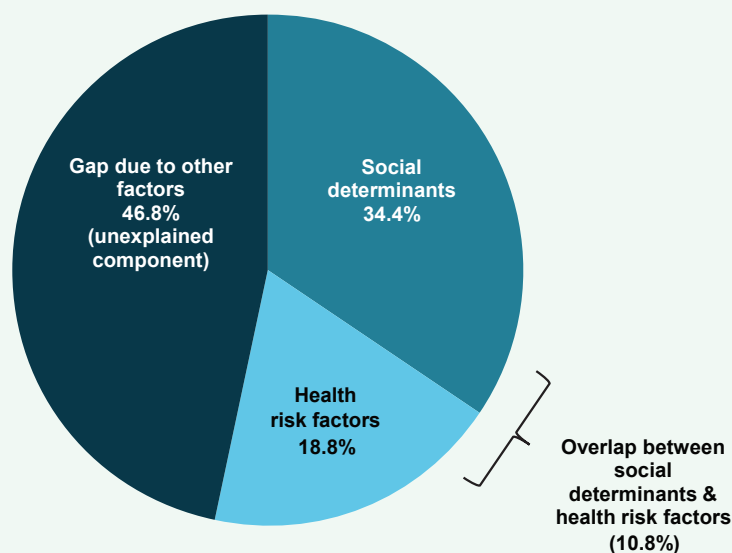
- Employment and hours worked
- Highest non-school qualification
- Level of school completed
- Housing adequacy (sufficient number of rooms)
- Household income

## Health risk factors

- Binge drinking
- High blood pressure
- Overweight and obesity status (body mass index)
- Inadequate fruit and vegetable consumption
- Insufficient physical exercise
- Smoking

The combined social determinants explain slightly more than one-third (34%) of the health gap and the selected health risk factors account for another 19%.

**Figure 6.7.3: Proportion of the adjusted health gap explained by differences in social determinants and health risk factors between Indigenous and non-Indigenous Australians, 2011–13**



Sources: AIHW analyses of ABS 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey, ABS 2011–12 Australian Health Survey; Table S6.7.2.

An estimated 11% of the total health gap can be attributed to the overlap, or interactions, between the social determinants and health risk factors. This is because the two sets of factors influence each other—their combined total contribution to the gap is less than the sum of their separate contributions. See chapter 6.6 'Social determinants and Indigenous health', which explores an example of these interactions—between smoking status and household income and education.

For more information see supplementary document S6.7 'Method for estimating the sources of the health gap' available online at <[www.aihw.gov.au/reports/australias-health/australias-health-2018/related-material](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/related-material)>.

## Tackling the different factors would reduce the gap

The analysis indicates that the adjusted health gap would be reduced from 27 percentage points to 13, if Indigenous working-age adults had the same average values for the 11 selected factors as non-Indigenous working-age adults. Most of the 14-percentage point reduction would come from social determinants (9 percentage points), with a 5-percentage point reduction due to health risk factors.

Another way to look at this result is this: 42% of Indigenous working-age adults would have been assessed as being in good health if they had had the same average values as non-Indigenous adults for the 11 selected factors (and the demographic and locational factors). This figure is well above the 28% of Indigenous adults in good health from the current survey results (shown in Figure 6.7.1).

## Nearly half the gap is not explained by the selected factors

While differences between Indigenous and non-Indigenous Australians across the 11 factors explain 53% of the gap, around 47% is left unexplained.

This unexplained component of the health gap partly reflects the possible effects of factors that contribute to good health but which were not able to be included in the statistical analyses, such as access to health care services. Improving access to health care services relative to need is of crucial importance for better Indigenous health outcomes (AHMAC 2017; AIHW 2014a, 2015); but this aspect could not be measured by the current survey data.

This analysis is based only on relationships between health status at one point in time (2011–13) and the social determinants and health risk factors. It does not account for the cumulative effects of any early life events on current health, or the effects of different social determinants and health risk factors that applied at other points in time. These effects will also be part of the unexplained component of the health gap, along with the effects of other factors that are intrinsically difficult to measure in a survey that records information at one point in time.

One part of the unexplained component of the health gap, however, will also reflect the effects of other disadvantages on health outcomes that occur due to the marginal position of Indigenous Australians in relation to mainstream society (Marmot 2011).



## Social determinants have the greatest effect on the health gap

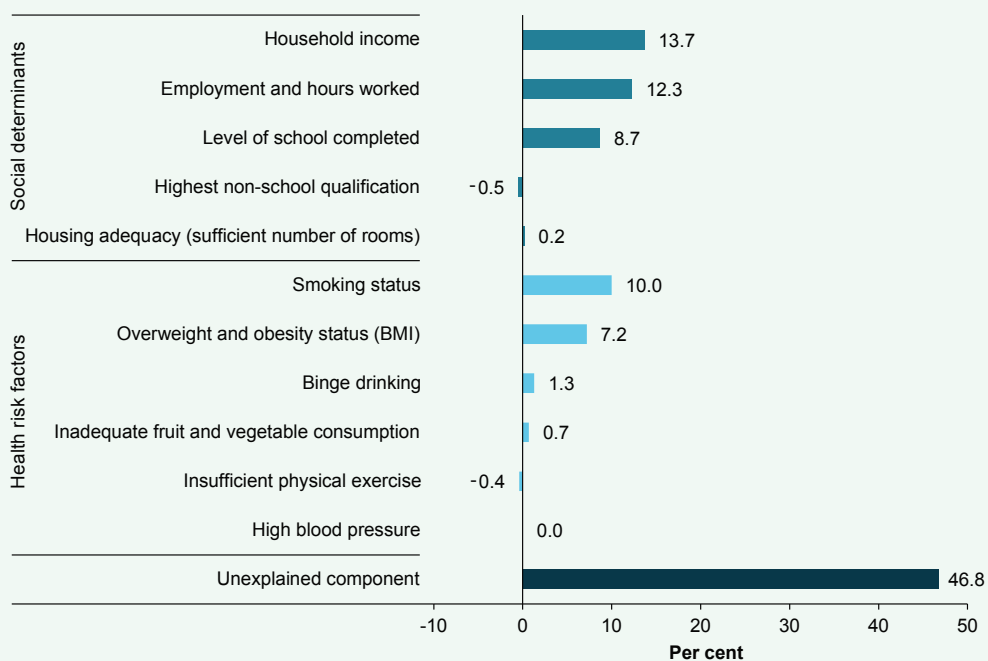
Household income differences contributed almost 14% of the overall health gap, followed by differences in employment and hours worked (12%), and level of school completed (8.7%) (Figure 6.7.4).

Among the health risk factors, differences in smoking status made the greatest contribution to the health gap, at 10%, followed by overweight and obesity status (7.2%).

Together, household income, employment/hours worked and smoking status account for 36% of the total health gap, which is more than two-thirds (68%) of the total contribution made by the 11 selected factors.

If Indigenous adults were to have the same average levels as non-Indigenous adults of just these three factors (that is, same household income, same employment rate and hours worked, and same smoking rate), the health gap would be reduced by more than a third—from 27 percentage points to around 17 percentage points.

**Figure 6.7.4: Contribution of individual social determinants and health risk factors to the adjusted health gap between Indigenous and non-Indigenous Australians, 2011–13**



*Note:* The contribution of a variable to the gap can be either positive or negative. A positive contribution means that the predicted gap would be lower than the actual gap if the two subgroups had the same levels of that explanatory variable. A negative contribution means that the predicted gap would be higher than the actual gap if the two subgroups had the same levels of that explanatory variable. A negative contribution also helps to 'explain' the gap in the sense that, were it not for the differences observed on that variable, the actual health gap would have been higher. The two negative contributions shown in this graph, however, are small and not significantly different from zero.

*Sources:* AIHW analyses of ABS 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey, ABS 2011–12 Australian Health Survey; Table S7.6.2.

## How do the key factors affect good health?

This section focuses on the five factors that contribute to most (98%) of the explained health gap between Indigenous and non-Indigenous adults in this analysis:

1. household income (equivalised by household size)
2. employment and hours worked
3. smoking status
4. level of school completed
5. overweight and obesity status.

It presents the results of statistical analysis on how much the presence (or absence) of these factors affects a person's chance of being in good health. These results are the first steps from which the contributions to the gaps were estimated. The analysis was carried out separately for the sample of Indigenous and non-Indigenous adults, and this section also highlights differences in results between the two groups.

The analysis estimated an odds ratio (OR) of a person being in good health for each factor—that is, the odds that a person would be in good health if they were exposed to a specific factor (for example, if they were a current smoker) compared with the odds of being in good health if they were not exposed to that factor (not smoking).

How the value of the estimated OR should be interpreted for each factor is outlined below.

An OR value of...	means...
1 (or close to 1)	the factor has little or no effect on the odds of being in good health, compared with a person in the reference group.
Greater than 1	the factor increases the odds of being in good health, compared with a person in the reference group. This implies a positive association between that factor and the good health measure.
Less than 1	the factor decreases the odds of being in good health, compared with a person in the reference group (a negative association between the factor and the good health measure).

Note that the odds of being in good health is not exactly the same as the likelihood (or probability) of being in good health. However, these concepts are directly related, and a factor that leads to increased odds also increases the likelihood.

For more information see supplementary document S6.7 'Method for estimating the sources of the health gap' available online at <[www.aihw.gov.au/reports/australias-health/australias-health-2018/related-material](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/related-material)>.

Focusing on aspects of each factor that increases the odds that someone will be in good health may offer a more targeted approach to reducing the health gap.

For some factors described in the sections that follow, the same factor significantly increases the odds of being in good health for non-Indigenous adults, but not for Indigenous adults. This may be an effect of the statistical model (considering the smaller Indigenous sample size, and inherently more non-Indigenous adults than Indigenous adults in 'good health' in the reference categories used to calculate the ORs). However, some of these differences in the estimated results form part of the unexplained component of the health gap.

The results on the estimated ORs for these selected five variables are shown in Figure 6.7.5, and summarised in the following sections.

## Employment and household income

Being employed and working for at least 25 hours a week with a higher income have positive effects on a person's health status.

Both Indigenous and non-Indigenous adults have significantly increased odds of being in good health—by a factor of at least 1.5—if they:

- work in paid employment for at least 25 hours each week
- have a household income in the top 30% of all households (when all household incomes are ranked from highest to lowest).

Employed non-Indigenous adults have significantly increased odds of being in good health—even if they work in paid employment for fewer than 25 hours each week—compared with non-Indigenous people who are not employed. For Indigenous adults, the health benefits of being employed are observed only for people who work more than 25 hours a week, compared with not working at all.

There is a similar pattern for people who earn a mid-range income—that is, in the middle 40% of all households when income is ranked from highest to lowest—compared with people whose incomes are in the lowest 30%. Earning a mid-range income (middle 40%) significantly increases the odds of being in good health for non-Indigenous adults only. For Indigenous adults, a significant effect of income in improving health is seen only for people in the top 30% of all households.

## Smoking status

Being a current smoker (compared with not smoking) reduces the odds of being in good health (1.5 times less likely) for both Indigenous and non-Indigenous adults.

## Level of school completed

Both Indigenous and non-Indigenous adults who have completed a higher level of secondary schooling have greater odds of being in good health.

For Indigenous adults, a higher level of schooling significantly increases the odds of a person being in good health *only* if they have completed Year 12 (compared with the reference category of having completed Year 9 or below). That is, for Indigenous adults who have completed Year 10 or 11, there is little or no increase in their odds of being in good health, compared with people who have completed Year 9 or below.

Non-Indigenous adults have significantly increased odds that they will be in good health if they have completed any year of schooling above Year 9.

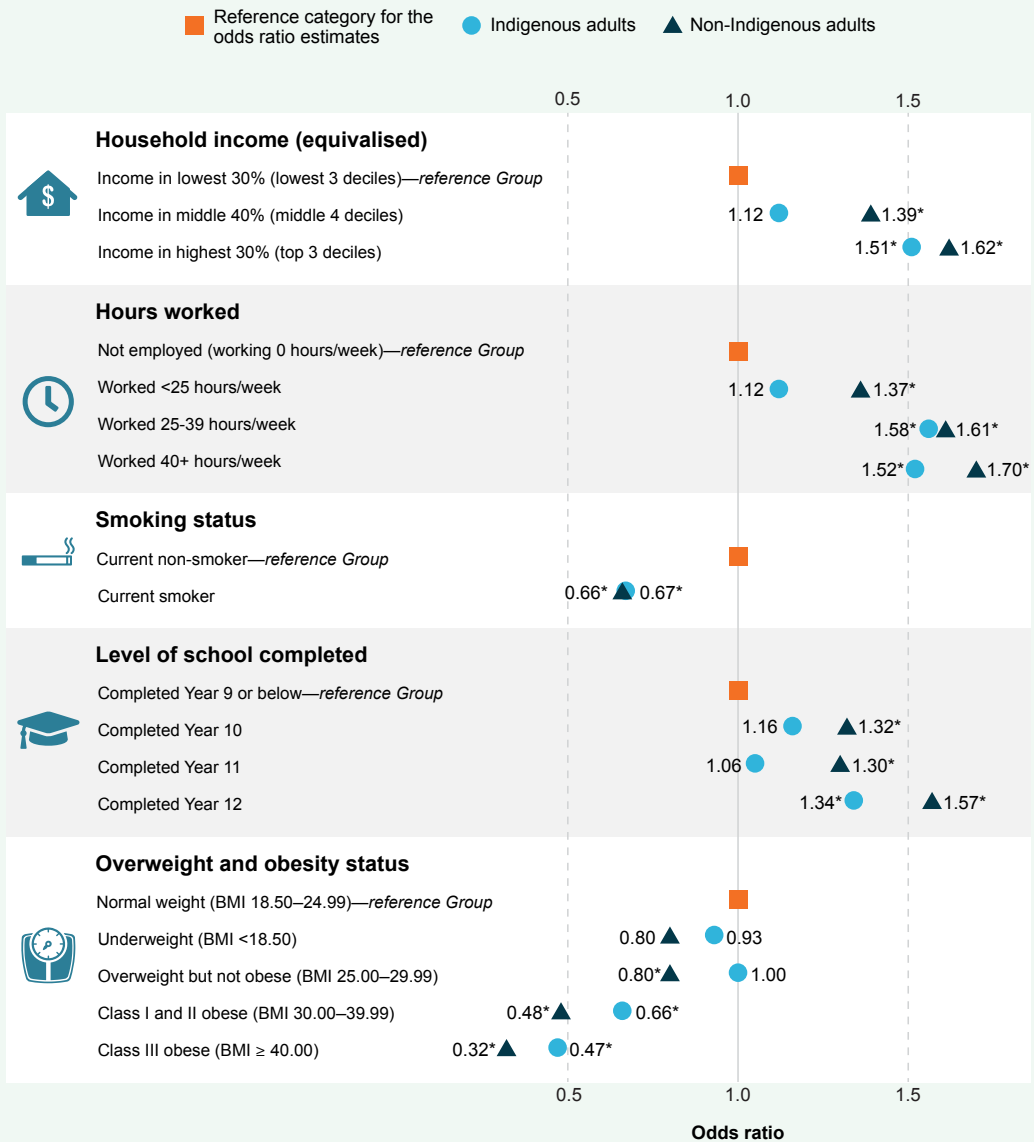
## Overweight and obesity status

Being obese (a body mass index, or BMI,  $\geq 30.00$ ) significantly reduces the odds of being in good health, compared with adults in the normal weight range (BMI 18.50–24.99).

In the class III obese category (BMI  $\geq 40.00$ ), the odds of being in good health are more than 3 times lower among non-Indigenous adults, and more than 2 times lower for Indigenous adults, compared with adults in the normal weight range.

Being in the overweight but not obese range (BMI 25.00–29.99) significantly reduces the odds of being in good health (compared with people in the normal weight range; BMI 18.50–24.99), but only for non-Indigenous adults. For Indigenous adults, there are no significant differences in the odds of being in good health, whether they are in the normal or overweight but not obese BMI ranges (18.50–24.99; 25.00–29.99).

**Figure 6.7.5: Estimated odds ratios for being in good health, by Indigenous status, 2011–13**



\* Estimated odds ratio (OR) are statistically different from 1 at the conventional 5% test level. The actual estimated value then indicates whether this estimate is significantly higher than 1 or significantly lower than 1. No asterisk means the estimated OR is not significantly different from 1 (meaning the odds of being in good health does not vary significantly between the designated category and the baseline or reference category for that factor).

Sources: AIHW analyses of ABS Australian Aboriginal and Torres Strait Islander Health Survey 2012–13, ABS 2011–12 Australian Health Survey.

## What does this mean?

These results illustrate the usefulness of looking behind the aggregate health gap to identify the key differences or sources that lead to the gap. The findings identify the most effective areas to target to reduce the health disparities between Indigenous and non-Indigenous Australians.

This sort of analysis shows how targeted policies can play a role in reducing health disparities. Considering the five factors that contribute most to the explained health gap—and the significantly increased odds of being in good health achieved through particular outcomes—health disparities could be reduced through policies that facilitate, for example, Indigenous Australians completing Year 12, being employed with close to full-time hours of work, not smoking, and maintaining a healthy weight.

The analysis also shows that improvements in one area, such as higher educational attainment, can also indirectly improve health outcomes by affecting other key factors, such as not smoking and working longer hours (which are associated with higher educational attainment).

## What is the AIHW doing?

The AIHW has a long history of monitoring and reporting on Indigenous health and socioeconomic outcomes, and the gaps observed between the Indigenous and non-Indigenous populations.

The AIHW prepares the detailed online tables for the biannual *Aboriginal and Torres Strait Islander Health Performance Framework* report, which provides the latest information on how Indigenous Australians are faring according to a wide range of health performance measures. The AIHW also has a regular publication series titled *The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples*.

The AIHW has undertaken technical analyses of the sources of the Indigenous health gap on other indicators, including life expectancy (AIHW 2016b:234–41); on the incidence of low birthweight babies using data from the National Perinatal Minimum Data set (AIHW 2017); and on the burden of disease (AIHW 2016a).

## What is missing from the picture?

It is likely that differences in access to affordable and nearby health services explain some proportion of the health gap between the Indigenous and non-Indigenous populations. That aspect, however, was not covered in this analysis. The topic is explored in chapter 6.8 'Indigenous Australians' access to and use of health services'. It could not be used in this analysis of the sources of the gap because data on similar types of access measures were not available from the surveys used for both Indigenous and non-Indigenous populations.

The analysis in this chapter is based on detailed health-related data from nationally representative and well-regarded surveys conducted by the ABS. However, the variables used to create the 'good health' measure at the centre of this analysis are derived from self-assessed/self-reported data. There are some known limitations of self-reported data in providing an accurate picture of objective health—analysis of self-reported measures alone may not be enough to inform health policy. The analysis could be extended with additional measures of the Indigenous health gap, reflecting objective health status.

Also, the data used for this analysis are from cross-sectional surveys that record point-in-time information. They ignore the potentially strong cumulative effects on current health, and social determinants and health risk factors, arising from early life events.

As well, this analysis looked only at the gap in health status of working-age adults (aged 15–64). Results may differ for other age groups.

Neither did this analysis consider any cultural determinants of health for Indigenous Australians. There is growing recognition that cultural determinants are important for Indigenous health, as a strong connection to culture is correlated with good health through strengthened identity, resilience and wellbeing (Department of Health 2017).

## Where do I go for more information?

More information about the main contributors to the Indigenous life expectancy gap can be found in Chapter 5.8 in *Australia's health 2016*.

More information on the previous analysis of the sources of the health gap can be found in Chapter 7.8 of *Australia's health 2014*.

More information on geographical variation in Indigenous people's access to primary health care services relative to need is available in the report *Access to primary health care relative to need for Indigenous Australians*.

More information on the Aboriginal and Torres Strait Islander Health Performance Framework is available at: <[www.aihw.gov.au/reports/indigenous-health-welfare/health-performance-framework/contents/summary](http://www.aihw.gov.au/reports/indigenous-health-welfare/health-performance-framework/contents/summary)>.

See also supplementary document S6.7 'Method for estimating the sources of the health gap' available online at <[www.aihw.gov.au/reports/australias-health/australias-health-2018/related-material](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/related-material)>.

## References

ABS (Australian Bureau of Statistics) 2013. Australian Health Survey: updated results, 2011–2012. ABS cat. no. 4364.0.55.003. Canberra: ABS.

ABS 2014. Australian Aboriginal and Torres Strait Islander Health Survey: updated results, 2012–13. ABS cat. no. 4727.0.55.006. Canberra: ABS.

AHMAC (Australian Health Ministers' Advisory Council) 2017. Aboriginal and Torres Strait Islander Health Performance Framework 2017 report. Canberra: AHMAC.

AIHW (Australian Institute of Health and Welfare) 2014a. Access to primary health care relative to need for Indigenous Australians. Cat. no. IHW 128. Canberra: AIHW.

AIHW 2014b. Australia's health 2014. Australia's health series no. 14. Cat. no. AUS 178. Canberra: AIHW.

AIHW 2015. Spatial variation in Aboriginal and Torres Strait Islander people's access to primary health care. Cat. no. IHW 155. Canberra: AIHW.

- AIHW 2016a. Australian Burden of Disease Study: impact and causes of illness and death in Aboriginal and Torres Strait Islander people 2011. Australian Burden of Disease Study series no. 6. Cat. no. BOD 7. Canberra: AIHW.
- AIHW 2016b. Australia's health 2016. Australia's health series no. 15. Cat. no. AUS 199. Canberra: AIHW.
- AIHW 2017. Aboriginal and Torres Strait Islander Health Performance Framework 2017: supplementary online tables. Cat. no. WEB 170. Canberra: AIHW.
- Biddle N, 2012. Improving Indigenous health: are mainstream determinants sufficient? In: Hunter B & Biddle N (eds). Survey analysis for Indigenous policy in Australia: Social Science Perspectives. CAEPR Research Monograph no. 32:65–78.
- Charlson ME, Pompei P, Ales KL & MacKenzie CR 1987. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. *Journal of Chronic Disease* 40:373–83.
- CSDH (Commission on Social Determinants of Health) 2008. Closing the gap in a generation: health equity through action on the social determinants of health. Final report of the Commission on Social Determinants of Health. Geneva: World Health Organization.
- Department of Health 2017. My life my lead—opportunities for strengthening approaches to the social determinants and cultural determinants of Indigenous health: report on the national consultations. Canberra: Department of Health.
- Mackenbach JP 2015. Socioeconomic inequalities in health in high-income countries: the facts and the options. In: *Oxford textbook of global public health*. Vol. 1. 6th edn. Oxford: Oxford University Press.
- Marmot M 2011. Social determinants and the health of Indigenous Australians. *Medical Journal of Australia* 194(10):512–13.
- PM&C (Department of the Prime Minister and Cabinet) 2018. Closing the Gap Prime Minister's report 2018. Canberra: PM&C.
- Shepherd CCJ, Li J & Zubrick SR 2012. Social gradients in the health of Indigenous Australians. *American Journal of Public Health* 102(1):107–17.
- World Health Organization (WHO) 1948. Preamble to the constitution of the World Health Organization. New York: WHO.



## 6.8 Indigenous Australians' access to and use of health services

To evaluate whether the health system is adequately meeting the needs of Aboriginal and Torres Strait Islanders, it is important to understand their access to, and use of, health services. Indigenous Australians may access mainstream or Indigenous-specific primary health care services (ISPHCS), which offer prevention, diagnosis and treatment of ill health in a range of settings (see Chapter 7.5 'Primary health care'). The Australian Government and/or state and territory governments fund Indigenous-specific services. They are available through community clinics, services provided by Aboriginal Community Controlled Health Organisations (ACCHOs) and other health care facilities. There are also Indigenous-specific services offered within some public hospitals in Australia.

Conceptually, access can mean many things. It can refer to whether health services are geographically accessible (that is, within a reasonable travel time/distance), financially accessible, culturally accessible, or whether they have the workforce or capacity to see patients when they need assistance. From a systemic perspective, where health services are located and how often people access or use those that are available are important measures. Data on all these aspects are rarely available, however. In their absence, service use is often used as a proxy measure.

This snapshot focuses on three indicators of service access and use: the availability of services provided by ISPHCS, the use of selected health services claimed through Medicare, and the use of hospital services.

### Indigenous-specific primary health care services

In 2015–16, ISPHCS were delivered by 204 organisations from 368 sites. Two-thirds (136 organisations) were ACCHOs; the other 68 comprised state and territory government-run organisations and other non-government-run organisations.

ISPHCS are an important service provider for Indigenous Australians throughout Australia. In 2015–16, one-third (33%) of services were located in *Very remote* areas, 23% in *Outer regional* areas and 21% in *Inner regional* areas. Smaller proportions were in *Remote* areas (13%) and *Major cities* (10%).

ISPHCS provided 3.9 million episodes of care to around 461,500 clients in 2015–16. However, because people may use several different ISPHCS, the number of clients is greater than the number of unique individuals who have used an ISPHCS (that is, if a person uses 2 different services, they will be counted as 2 clients—one at each service).

Most (89%) sites operated 5 days or more per week, and 26% offered 24-hour emergency care, which was similar to the scenario in 2014–15 (88% and 26%, respectively). Most sites provided clinical services, such as the diagnosis and treatment of chronic illnesses (85%), antenatal care (75%), maternal and child health care (80%), and mental health and counselling services (84%). Many also offered tobacco programs (61%) and substance-use programs (60%).

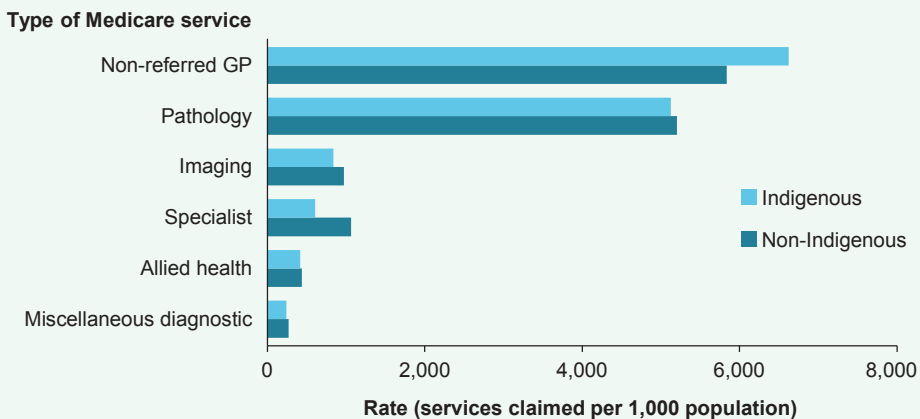


## Use of selected health services claimed through Medicare

Data from 2015–16 show that Medicare Benefits Schedule (MBS) claim rates for general practitioner (GP) visits were 10% higher for Indigenous than non-Indigenous Australians, but claim rates for specialist services were 43% lower. This may reflect difficulties in accessing specialist services (Figure 6.8.1).

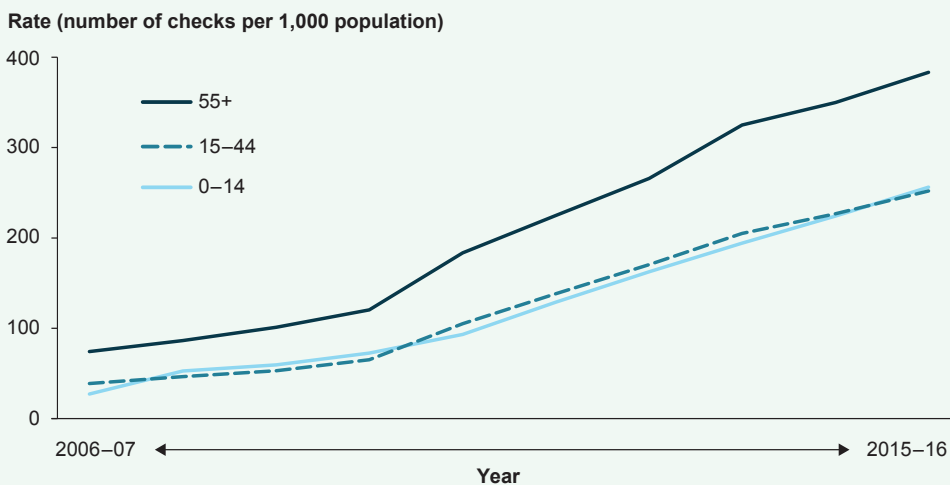
Both the number and rates of MBS health checks among Indigenous Australians rose significantly from 2006–07 to 2015–16 for all age groups (Figure 6.8.2; Table 6.8.1). In 2006–2007, there were around 22,500 health checks performed. By 2015–16, that number had risen to nearly 197,000.

**Figure 6.8.1: Age-standardised rate of claimed Medicare services, by selected types of service and Indigenous status, 2015–16**



Source: DHS 2017; Table S6.8.1.

**Figure 6.8.2: Rate of MBS health checks for Indigenous Australians, by age, 2006–07 to 2015–16**



Source: DHS 2017; Tables S.6.8.2.

**Table 6.8.1: Number of MBS health checks/assessments for Indigenous Australians<sup>(a)</sup> (MBS item 715<sup>(b)</sup>), by age, 2006–07 to 2015–16<sup>(c)</sup>**

Age	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14	2014–15	2015–16
<b>0–14</b>	6,315	12,397	14,160	17,363	22,415	31,078	39,420	47,414	55,245	63,790
<b>15–44</b>	12,775	15,684	18,369	23,197	38,331	51,757	65,525	80,645	91,172	103,565
<b>55+</b>	3,473	4,262	5,254	6,602	10,623	13,744	17,216	22,295	25,369	29,404
<b>Total<sup>(d)</sup></b>	<b>22,563</b>	<b>32,343</b>	<b>37,783</b>	<b>47,162</b>	<b>71,369</b>	<b>96,580</b>	<b>122,160</b>	<b>150,354</b>	<b>171,786</b>	<b>196,758</b>

- (a) Indigenous identification not adjusted using Voluntary Indigenous Indicator (VII) data.
- (b) As Item 715 started in May 2010, MBS codes 704, 706, 708 and 710 were reclassified as 715 for prior years.
- (c) Financial year reporting.
- (d) Total may not sum exactly due to rounding.

Source: DHS 2017.

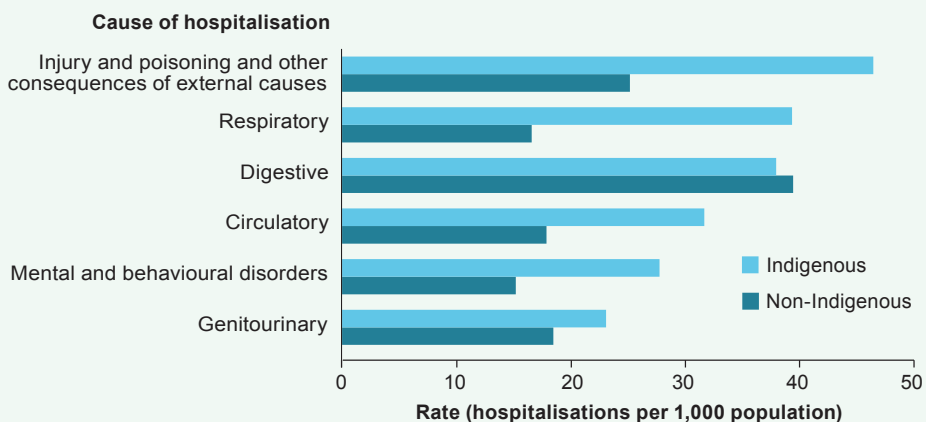
## Hospital services

Indigenous Australians are relatively high users of hospital services, most of which are accessed through public hospitals. Between July 2013 and June 2015, there were around 458,000 hospitalisations (excluding dialysis) for Indigenous Australians; this equates to a rate that is 1.3 times the rate for non-Indigenous Australians. There were an additional 393,000 dialysis-related hospitalisations.

Admissions for potentially preventable conditions (PPHs) reflect hospitalisations that might have been prevented through the timely and appropriate provision and use of primary care or other non-hospital services (Li et al. 2009). In 2013–15, the rate for PPHs was 3 times as high for Indigenous Australians (69 per 1,000 compared with 23 per 1,000 for non-Indigenous Australians).

The leading cause of hospitalisation in 2013–15 for Indigenous Australians was injury, poisoning and other external causes, followed by respiratory system diseases (Figure 6.8.3). The only specific cause of hospitalisation where the rate for non-Indigenous Australians was higher than that for Indigenous Australians was for digestive conditions.

**Figure 6.8.3: Age-standardised rates of the leading causes of Indigenous hospitalisation, by Indigenous status, 2013–15**



Note: Excluding dialysis and pregnancy/childbirth.  
Source: National Hospital Morbidity Database; Table S6.8.3.

## What is missing from the picture?

Comprehensive data on Indigenous Australians' use of mainstream health services are lacking. This makes it difficult to determine patterns in the use of health services. Incomplete identification of Indigenous people in mainstream health services data can also lead to an underestimation of service use. Data are also missing on the number of unique individuals using ISPHCS as clients who use more than one service are counted within each service.

## Where do I go for more information?

For more information on spatial access to services see the AIHW reports *Spatial variation in Aboriginal and Torres Strait Islander women's access to 4 types of maternal health services*, *Spatial variation in Aboriginal and Torres Strait Islander people's access to primary health services* and *Access to primary health care relative to need for Indigenous Australians*.

Data and information on ISPHCS are available from the AIHW website:

<[www.aihw.gov.au/reports-statistics/health-welfare-services/indigenous-health-welfare-services/overview](http://www.aihw.gov.au/reports-statistics/health-welfare-services/indigenous-health-welfare-services/overview)>, and the interactive health check tool is available at

<[www.aihw.gov.au/reports/indigenous-health-welfare-services/indigenous-health-check-mbs-715-data-tool/contents/dynamic-data-displays](http://www.aihw.gov.au/reports/indigenous-health-welfare-services/indigenous-health-check-mbs-715-data-tool/contents/dynamic-data-displays)>.

## References

DHS (Department of Human Services) 2017. Medicare Item Reports. Data online at <[http://medicarestatistics.humanservices.gov.au/statistics/mbs\\_item.jsp](http://medicarestatistics.humanservices.gov.au/statistics/mbs_item.jsp)>.

Li SQ, Gray NJ, Guthridge SL & Pircher SBLM 2009. Avoidable hospitalisation in Aboriginal and non-Aboriginal people in the Northern Territory. *Medical Journal of Australia* 190(10):532–6.

## 6.9 Supply of the health workforce for the Indigenous population

Appropriate, culturally safe and accessible services are an essential component of health care for Aboriginal and Torres Strait Islander Australians (Department of Health 2013). Previous work by the AIHW has shown, however, that not all Indigenous Australians have equal access to health service locations, and that, on average, areas characterised by poorer access also have poorer health outcomes (AIHW 2015, 2017).

The differential supply and accessibility of health services is compounded by the fact that Indigenous Australians are more likely than non-Indigenous Australians to live in *Remote* and *Very remote* areas. This population distribution is important because distance and remoteness often pose substantial challenges for workforce recruitment and health service delivery, particularly in areas where populations are widely dispersed or isolated.

Identifying areas of relative workforce supply challenges is an important first step for policy discussions on how to:

- improve supply in these areas, or
- ensure that residents' needs for primary health care services are met in other ways (such as through outreach services, telehealth and e-health, medical chests with essential supplies for emergency and non-emergency treatment, the S100 Remote Aboriginal Health Services Program for accessing medicines, and online/telephone-based counselling by psychologists).

This article focuses on how the supply of three groups of relevant health professionals—general practitioners (GPs), dentists and midwives—is distributed across Australia. It uses a new index developed by the AIHW, the Geographically-adjusted Index of Relative Supply (GIRS), to identify areas with supply challenges, and looks at the numbers and percentages of Indigenous Australians who live in these areas. Summary-level information is also presented on the relative workforce supply for nurses, pharmacists, psychologists and optometrists. It is important to note that the GIRS is a relative supply measure—it is not a measure of the extent to which people are able to access services.

### What is the GIRS?

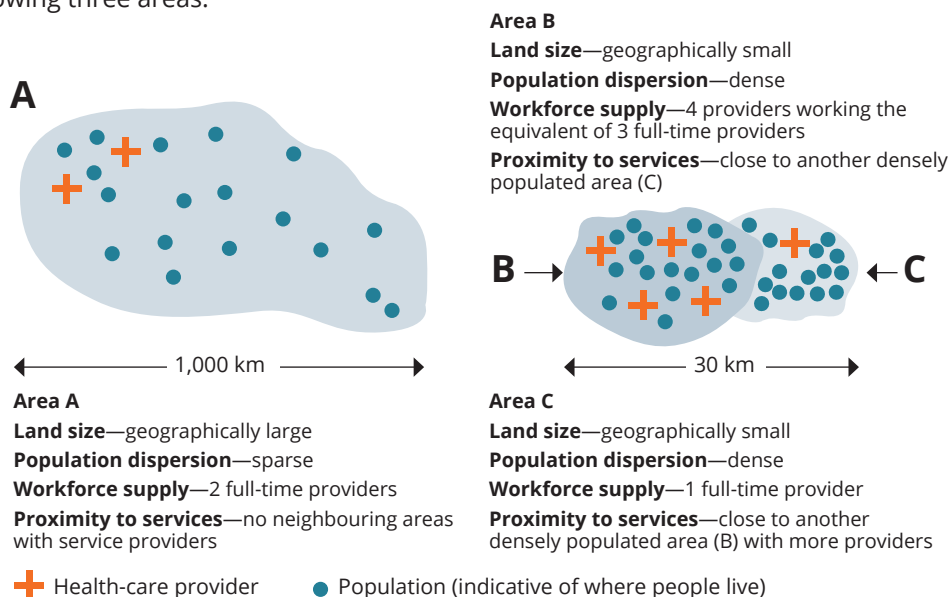
The GIRS is an index used to compare health workforce supply across small geographic areas. It ranges from 0 to 8 and was calculated for each of the 2,092 Statistical Area Level 2s (SA2s) in Australia, using workforce data from 2014. Areas with lower GIRS scores face relatively more challenges with workforce supply than those with higher GIRS scores. This does not imply, however, that areas with higher GIRS scores do not face such challenges.

The GIRS takes the known workforce supply based in an area and adjusts it for three other factors—land size, population dispersion, and the proximity of the population to the relevant service locations. Box 6.9.1 provides an overview of why these factors are important.



### Box 6.9.1: Why create the Geographically-adjusted Index of Relative Supply?

Without taking account of land size, population dispersion and the proximity of the population to relevant service locations, comparisons of workforce supply across areas can be misleading. For example, the most common way to measure workforce supply is to calculate a provider-to-population ratio, which looks at the number of full-time providers per 1,000 people in an area. Now consider the following three areas:



For these three example areas, the provider-to-population ratios are:

A: 1 provider per 1,000 people (2 full-time providers divided by 2,000 people)

B: 1 provider per 1,000 people (equivalent of 3 full-time providers divided by 3,000 people—made up of 4 part-time providers)

C: 0.25 provider per 1,000 people (1 full-time provider divided by 4,000 people).

Based on provider-to-population ratios, the workforce supply in areas A and B is the same, and there is a lower workforce supply in area C. Comparing areas A and B, however, shows that area A is much bigger, its population is widely dispersed across its large area, and its 2 providers are both located in one corner of the area. Many of the people living in area A are likely to have poorer access to the services because of the distance they have to travel within the area and the fact that there are no services in neighbouring areas. Furthermore, it is likely that the providers in area A also serve populations in other nearby areas, so the provider-to-population ratio potentially overstates the workforce supply available to people in that area.

It also appears from the provider-to-population ratio that area C faces the most workforce supply challenges of the three areas; however, people in area C are within a reasonable driving distance of the providers in area B and can access services in that area as well. Thus, the provider-to-population ratio understates the workforce supply available to people in area C.

### **Box 6.9.1 (continued): Why create the Geographically-adjusted Index of Relative Supply?**

The GIRS takes into account how hard it might be for people to access services based on the dispersion of the population, the size of the area and whether people can access services in neighbouring areas. Therefore, it is a better indicator of the relative workforce supply in an area than provider-to-population ratios on their own.

For more information see supplementary document S6.9 'Estimating the supply of the health workforce' available online at <[www.aihw.gov.au/reports/australias-health/australias-health-2018/related-material](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/related-material)>.

## Relationship between the GIRS and health outcomes

The GIRS aims to capture relative workforce supply across areas. A low GIRS score would be expected to indicate an area where the risk of poor health outcomes is relatively high because of these supply challenges. One indicator that has been shown to relate to poor access to primary health services is potentially preventable hospitalisations (PPHs)—namely, hospitalisations that might have been prevented through the timely and appropriate provision and use of primary care or other non-hospital services (AIHW 2014a; Li et al. 2009).

A correlation analysis of GIRS scores with PPH rates at the SA2 level found that areas with lower relative workforce supply were significantly more likely to have a higher percentage of hospitalisations that were potentially preventable than areas with higher relative workforce supply. The relationship between PPH and relative workforce supply was tested separately for GPs, pharmacists and dentists, and the association was statistically significant for all three professions (AIHW 2016a).

## Bringing together relative workforce supply and the distribution of the Indigenous population

Information on the number of Indigenous and non-Indigenous Australians living in each SA2 was linked with the GIRS scores to calculate the number of Indigenous people who live in areas with relative workforce supply challenges.

The next section of this article presents the findings for GPs, dentists and midwives.

### **Guide to GIRS scores**

There is an inverse relationship between GIRS scores and the likelihood of relative workforce supply challenges; that is, areas with a GIRS score of 0 or 1 are likely to face higher workforce supply challenges than areas with a GIRS score of 6–8.

## General practitioners

GPs are medical practitioners who are registered with the Medical Board of Australia. After completing their university studies, they receive provisional registration and must complete an internship and specialist training before receiving general medical registration.

GPs play a key role in Australia's primary health care system. Their duties include providing preventive care and screening, managing acute and chronic illnesses and providing a link to specialist and multidisciplinary care. They also perform important legal functions, such as certifying documents and assessing eligibility for programs such as the Disability Support Pension. GPs work in a variety of settings, including in private, solo or group practices; in Indigenous Specific Primary Health Care Services (ISPHCS) and/or community health services; and in hospital-based clinics. They may also provide additional services outside their practice locations, including at outreach clinics and through home visits and visits to locations such as aged care facilities (AIHW 2014a).

Given the higher health needs of the Indigenous population relative to the non-Indigenous population, the supply of the GP workforce is a critical issue for Indigenous people. Identifying areas in which Indigenous people live that have relatively low supplies of GPs provides a starting point for further examination and potential policy follow-up.

### Relative workforce supply of GPs and relationship to the distribution of the Indigenous population

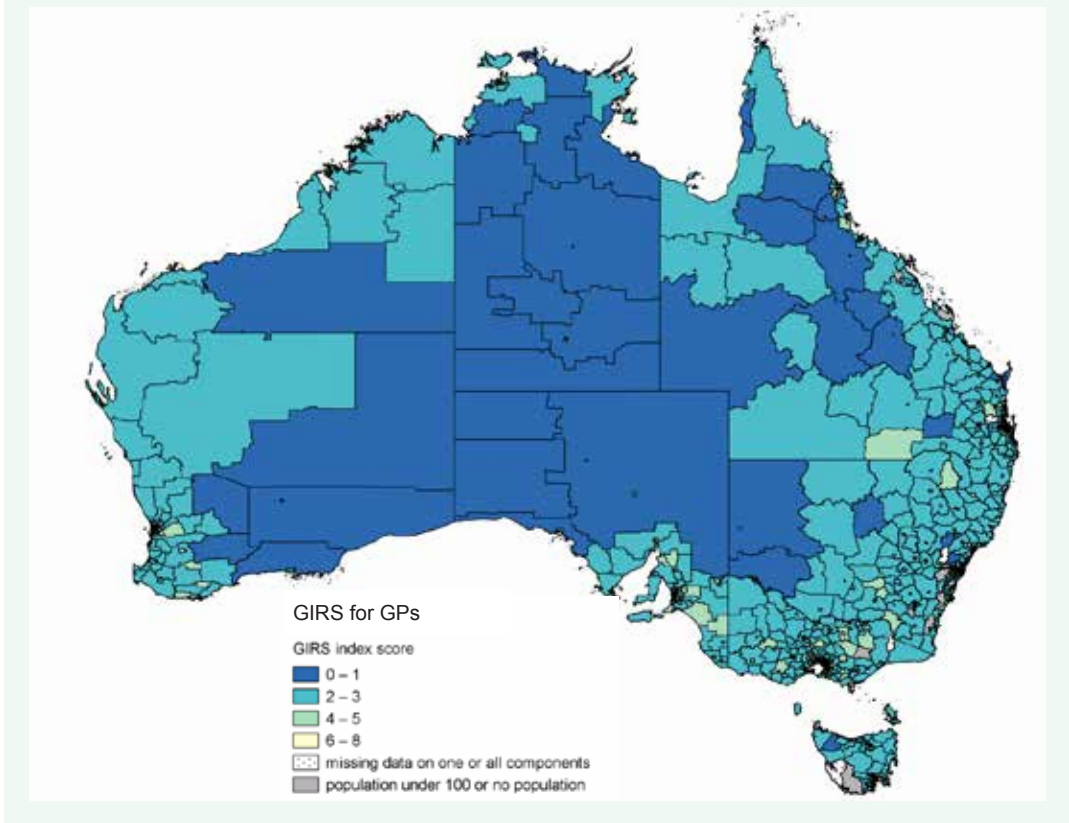
The geographic distribution of the relative workforce supply of GPs throughout Australia is shown in Figure 6.9.1. There were 39 areas with a high probability of GP workforce supply challenges (GIRS scores of 0–1): 23 were in *Very remote* areas, 7 in *Remote* areas, 6 in *Outer regional* areas and 3 in *Inner regional* areas (for more information on the distribution of the GIRS by remoteness see Supplementary Table S6.9.1).



For an interactive version of the map in Figure 6.9.1, see the online data visualisation tool at <[www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/supply-of-the-health-workforce-for-the-indigenous-population-maps](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/supply-of-the-health-workforce-for-the-indigenous-population-maps)>.



Figure 6.9.1: GP GIRS scores by SA2, 2014



More than 46,000 Indigenous Australians (6.9% of the Indigenous population) live in the 39 areas with the highest likelihoods of GP workforce supply challenges. This percentage is 14 times as high as that for non-Indigenous Australians (0.5%) (Table 6.9.1).

Table 6.9.1: Distribution of SA2s and population by area-level relative GP workforce supply (GIRS score), 2014

GP GIRS score	Number of SA2s	Population distribution (number)			Population distribution (%)		Rate ratio
		Indigenous	Non-Indigenous	Total	Indigenous	Non-Indigenous	
0-1	39	46,199	108,321	154,520	6.9	0.5	13.8
2-3	397	169,980	2,438,260	2,620,529	25.4	11.3	2.2
4-5	834	279,754	9,372,408	9,691,475	41.9	43.4	1.0
6-8	822	172,308	9,680,037	9,853,282	25.8	44.8	0.6
<b>Total</b>	<b>2,092</b>	<b>668,241</b>	<b>21,599,026</b>	<b>22,319,806</b>	<b>100.0</b>	<b>100.0</b>	

Note: Lower GIRS scores indicate areas with higher probabilities of workforce supply challenges compared with areas with higher GIRS scores. The Indigenous and non-Indigenous populations do not add up to the total population as the Australian Bureau of Statistics did not provide a breakdown by Indigenous status for 23 SA2s. Only SA2s with at least a population of 100 were included.

## Dentists

Dentists are independent practitioners who provide assessment, diagnosis, treatment, management and preventive services related to oral health. The education requirement for a graduate dentist to be registered is a minimum 4-year full-time education program approved by the National Board (Dental Board of Australia 2015).

Physical, financial and cultural access to dentists is a critical issue for Indigenous health. Indigenous Australians have overall poorer oral health than non-Indigenous Australians, which includes having more caries (cavities), more tooth loss and higher rates of periodontal disease. Poor dental health has important social as well as physical consequences, and can affect all aspects of daily life.

Dentist services may be delivered by resident or visiting dentists at private practice locations, in clinic/hospital settings, through ISPHCS or through mobile dental services.

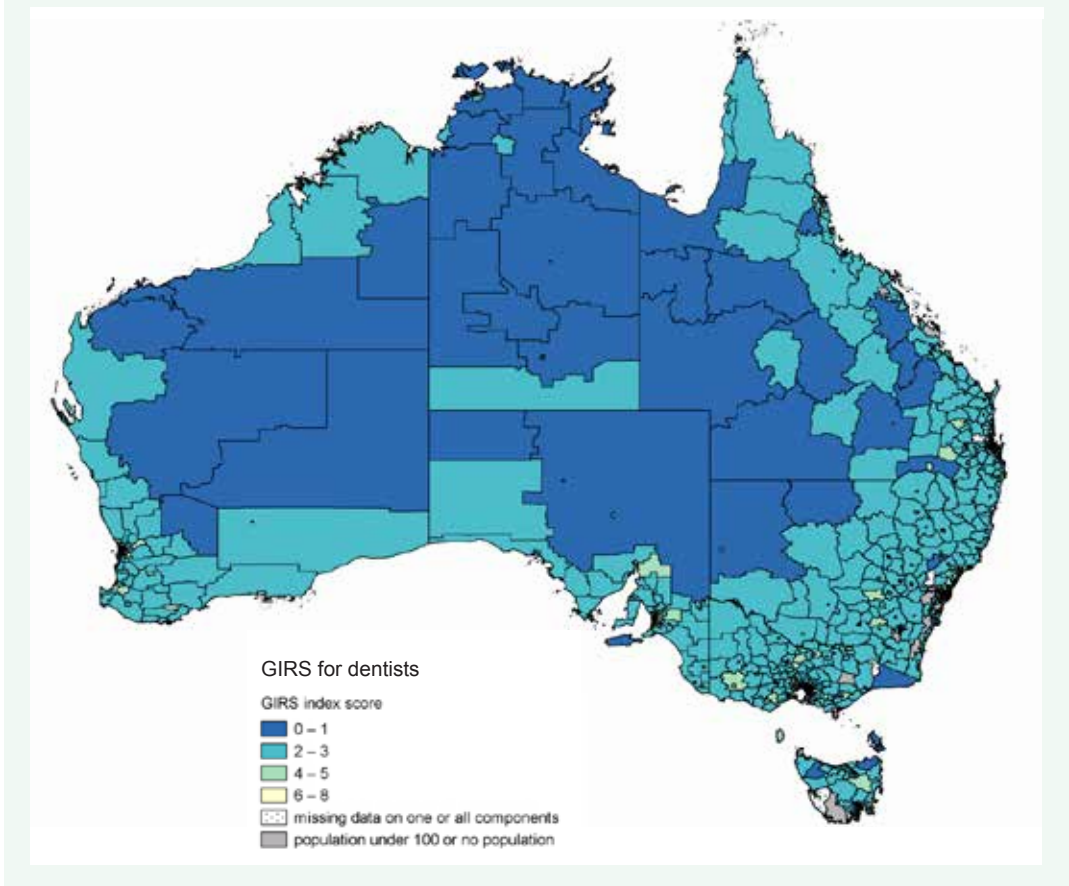
### Relative workforce supply of dentists and relationship to the distribution of the Indigenous population

The relative workforce supply of dentists across Australia is shown in Figure 6.9.2. There were 43 areas with the highest probability of dentist workforce supply challenges (GIRS scores of 0–1): 25 in *Very remote* areas, 7 in *Remote* areas, 10 in *Outer regional* areas and 1 in an *Inner regional* area (for more information on the distribution of the GIRS by remoteness see Supplementary Table S6.9.2).



For an interactive version of the map in Figure 6.9.2, see the online data visualisation tool at [www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/supply-of-the-health-workforce-for-the-indigenous-population-maps](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/supply-of-the-health-workforce-for-the-indigenous-population-maps).

Figure 6.9.2: Dentist GIRS scores by SA2, 2014



Nearly 77,000 Indigenous Australians (12% of the Indigenous population) live in the 43 areas with the highest likelihoods of dentist workforce supply challenges. This percentage is 19 times as high as that for non-Indigenous Australians (Table 6.9.2).

Table 6.9.2: Distribution of SA2s and population by area-level relative dentist workforce supply (GIRS score), 2014

Dentist GIRS score	Number of SA2s	Population distribution (number)			Population distribution (%)		
		Indigenous	Non-Indigenous	Total	Indigenous	Non-Indigenous	Rate ratio
0-1	43	76,803	132,602	209,405	11.5	0.6	18.8
2-3	396	137,746	2,388,973	2,539,008	20.6	11.1	1.9
4-5	749	272,780	8,272,467	8,584,560	40.8	38.3	1.1
6-8	905	180,912	10,804,984	10,986,833	27.1	50.0	0.5
<b>Total</b>	<b>2,092</b>	<b>668,241</b>	<b>21,599,026</b>	<b>22,319,806</b>	<b>100.0</b>	<b>100.0</b>	

Note: Lower GIRS scores indicate areas with higher probabilities of workforce supply challenges compared with areas with higher GIRS scores. The Indigenous and non-Indigenous populations do not add up to the total population because the Australian Bureau of Statistics did not provide a breakdown by Indigenous status for 23 SA2s.

## Midwives

Midwives provide care and advice to women during pregnancy, labour and birth; they also provide postnatal care for women and babies in diverse settings, including the home, community, hospitals, clinics, ISPHCS, and health units (AIHW 2013b). Midwives can be registered as nurses, as midwives, or as both. Only data on midwifery-specific full-time equivalents were included in the midwifery GIRS.

To register and practise as a midwife, a person must have appropriate qualifications in midwifery. There are two paths to obtaining these qualifications. Midwives can first qualify as a registered nurse and then undertake additional education and training in midwifery. However, some universities now offer direct-entry midwifery undergraduate programs. Direct-entry midwives, as with other midwives, must be registered with the Nursing and Midwifery Board of Australia to practise, but are restricted to practising midwifery only, whereas other midwives can also practise general nursing.

Access to midwives is particularly critical for the health of Indigenous mothers and babies. Indigenous mothers are less likely to attend antenatal care in the first trimester of pregnancy, have higher levels of social disadvantage, and are more likely to smoke during pregnancy. These factors contribute to the higher likelihood that babies born to Indigenous mothers are born prematurely and are of low birthweight. Both these factors increase the likelihood of babies dying before their first birthday.

There are a large number of government and non-government initiatives to improve access to high-quality, culturally appropriate care for Indigenous mothers and babies in order to reduce these disparities (AIHW 2014b).

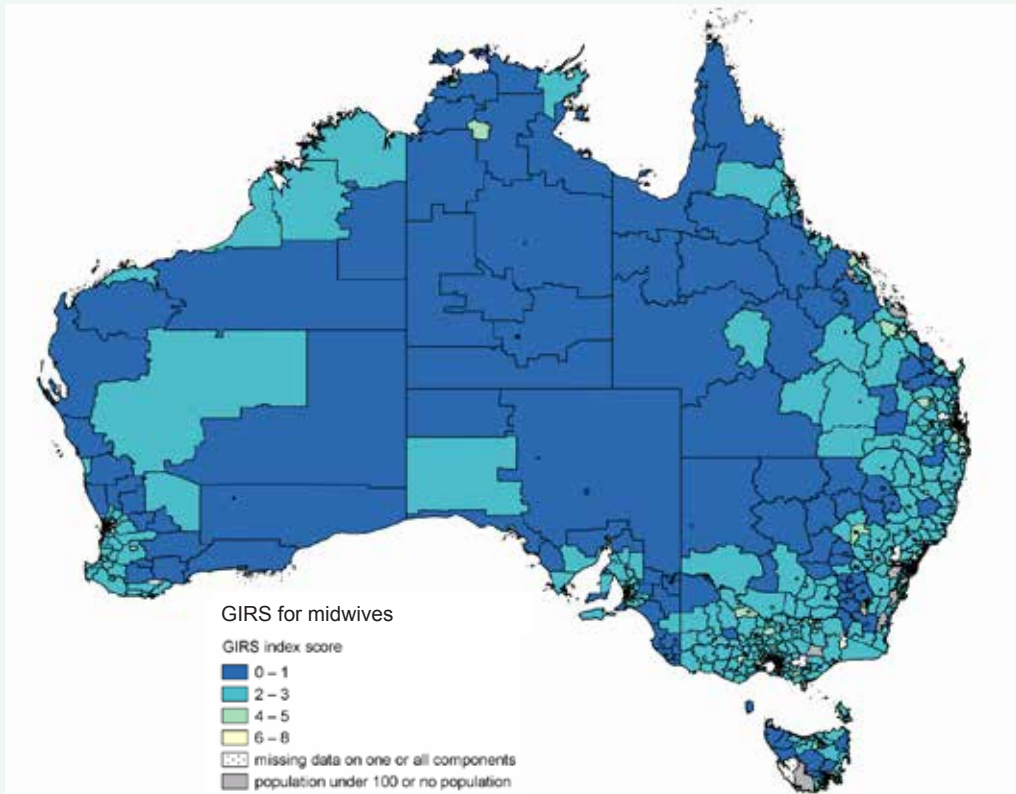
## Relative workforce supply of midwives and relationship to the distribution of Indigenous women of child-bearing age

The relative workforce supply of midwives across Australia is shown in Figure 6.9.3. There were 120 areas with the highest probability of midwife workforce supply challenges (GIRS scores of 0–1): 34 in *Very remote* areas, 22 in *Remote* areas, 51 in *Outer regional* areas and 13 in *Inner regional* areas (for more information on the distribution of the GIRS by remoteness see Supplementary Table S6.9.3).



For an interactive version of the map in Figure 6.9.3, see the online data visualisation tool at <[www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/supply-of-the-health-workforce-for-the-indigenous-population-maps](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/supply-of-the-health-workforce-for-the-indigenous-population-maps)>.

Figure 6.9.3: Midwife GIRS scores by SA2, 2014



Because the midwife workforce supply is most relevant for women of child-bearing age, the focus on the population distribution across areas is on women aged 15–44. Slightly more than 19,000 Indigenous women of child-bearing age (15%) live in areas with the highest likelihood of midwife workforce supply challenges. This percentage is 8 times as high as that for non-Indigenous women of child-bearing age (Table 6.9.3).

Table 6.9.3: Distribution of SA2s and the population of women of child-bearing age by area-level relative midwife workforce supply (GIRS score), 2014

Midwife GIRS score	Number of SA2s	Population distribution (number)			Population distribution (%)		
		Indigenous	Non-Indigenous	Total	Indigenous	Non-Indigenous	Rate ratio
0–1	120	19,017	74,966	98,083	15.3	1.8	8.4
2–3	364	23,267	376,302	415,632	18.8	9.1	2.1
4–5	723	43,390	1,521,669	1,626,721	35.0	36.9	0.9
6–8	884	38,309	2,149,469	2,302,754	30.9	52.1	0.6
<b>Total</b>	<b>2,091</b>	<b>123,983</b>	<b>4,122,406</b>	<b>4,443,190</b>	<b>100.0</b>	<b>100.0</b>	

Note: Lower GIRS scores indicate areas with higher probabilities of workforce supply challenges compared with areas with higher GIRS scores. The Indigenous and non-Indigenous populations do not add up to the total population because the Australian Bureau of Statistics did not provide a breakdown by Indigenous status for 23 SA2s.

## Additional professions

The focus of this article has been on relative workforce supply challenges for GPs, dentists and midwives, as measured by the GIRS. These findings are drawn from a larger project that also examined the workforce supply of nurses, pharmacists, psychologists and optometrists (AIHW 2016a).

A summary of GIRS scores for all seven professions is presented in Table 6.9.4. It shows that, relative to other professions, a greater proportion of areas faced likely supply challenges (GIRS score of 0 or 1) for midwives (5.7%) and optometrists (2.7%). By comparison, less than 1% of areas faced supply challenges for nurses.

**Table 6.9.4: Distribution of SA2s by relative workforce supply and profession**

Number of SA2s by GIRS scores and profession							
GIRS score	GPs	Nurses	Midwives	Pharmacists	Dentists	Psychologists	Optometrists
0–1	39	17	120	45	43	49	56
2–3	397	436	364	391	396	400	365
4–5	834	808	723	750	748	687	776
6–8	822	831	884	906	905	956	895
<b>Total</b>	<b>2,092</b>	<b>2,092</b>	<b>2,091</b>	<b>2,092</b>	<b>2,092</b>	<b>2,092</b>	<b>2,092</b>
% of SA2s by GIRS scores and profession							
GIRS score	GPs	Nurses	Midwives	Pharmacists	Dentists	Psychologists	Optometrists
0–1	1.9	0.8	5.7	2.2	2.1	2.3	2.7
2–3	19.0	20.8	17.4	18.7	18.9	19.1	17.4
4–5	39.9	38.6	34.6	35.9	35.8	32.8	37.1
6–8	39.3	39.7	42.3	43.3	43.3	45.7	42.8
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

*Note:* Includes only SA2s with resident populations of at least 100 people and valid data on all four GIRS components. Scores of 0 and 1 indicate a higher probability that an area faces supply challenges compared with areas with higher GIRS scores. There are only 2,091 SA2s with valid midwife GIRS scores.

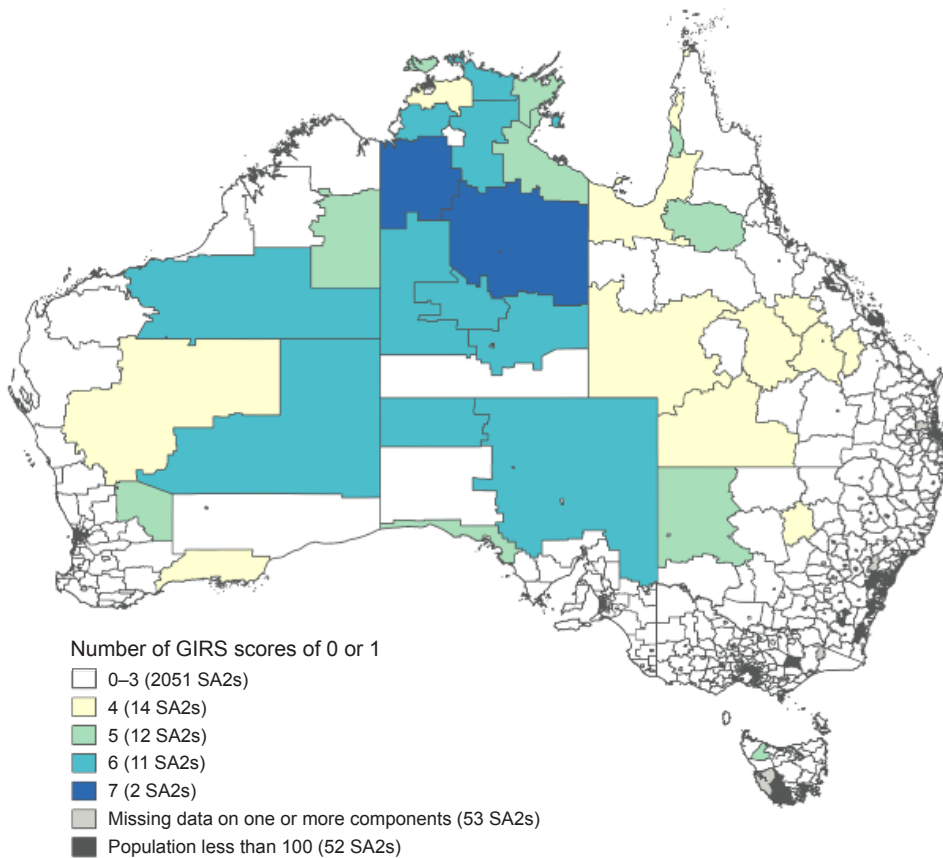
## Consistency in relative workforce supply within areas

Individual GIRS scores are important to identify areas of workforce supply challenge for each profession. Another issue is the consistency in workforce supply across professions. In other words, if an area had likely workforce supply challenges for one profession, did it also have these challenges for other professions? It might be expected, for example, that regions with a lower relative supply of GPs or nurses might also have a lower relative supply of dentists or psychologists.

To measure the consistency of relative workforce supply across the seven professions, the number of times that each SA2 had a GIRS score of 0 or 1 (that is, it was measured as having a low level of relative supply for that profession) was counted across the seven professions. Values for this summary score can range between 0 (no GIRS scores of 0 or 1) to 7 (GIRS scores of 0 or 1 for every profession). Unlike the GIRS scores, where a lower score means a higher potential for workforce supply challenges, higher values on the summary score reflect a higher number of workforce supply challenges.

The spatial distribution of this summary score is presented in Figure 6.9.4. There were 39 SA2s (1.9%) that had relative workforce supply challenges for at least four of the seven included professions. More than 72,600 Indigenous Australians (11%) live in these areas, compared with 0.4% of the non-Indigenous population. This includes more than 30,000 Indigenous Australians living in areas with likely workforce supply challenges for at least six of the seven included professions (Table 6.9.5).

**Figure 6.9.4: Summary score of relative workforce supply challenges across professions by SA2, 2014**



For an interactive version of this map see the online data visualisation tool at [www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/supply-of-the-health-workforce-for-the-indigenous-population-maps](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/supply-of-the-health-workforce-for-the-indigenous-population-maps).

Table 6.9.5: Summary score of relative workforce supply across all seven professions

Summary score	Areas		Population distribution			
			Number		%	
	No. of SA2s	%	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous
0 (no GIRS scores of 0 or 1 for any profession)	1,936	92.5	534,066	20,786,865	80.5	97.0
1	79	3.8	29,100	402,938	4.4	1.9
2	17	0.8	14,888	69,048	2.2	0.3
3	20	1.0	12,539	83,105	1.9	0.4
4	14	0.7	19,030	45,677	2.9	0.2
5	12	0.6	22,589	26,496	3.4	0.1
6	11	0.5	26,357	16,514	4.0	0.1
7 (GIRS scores of 0 or 1 for every profession)	2	0.1	4,695	1,225	0.7	0.0
<b>Total</b>	<b>2,091</b>	<b>100.0</b>	<b>663,264</b>	<b>21,431,868</b>	<b>100.00</b>	<b>100.00</b>

Note: Higher numbers of GIRS scores of 0 or 1 indicate a greater level of relative workforce supply challenges. SA2s included are only those with resident populations greater than 100 and valid data for all seven GIRS scores.

## What is the AIHW doing?

The AIHW is incorporating relative workforce supply measures in analyses of how area-level characteristics can help to explain geographic variation in health outcomes for Indigenous Australians.

## What is missing from the picture?

The GIRS was unable to include important factors such as the adequacy of services, the extent to which services are financially or culturally accessible and the extent to which the services in an area meet the needs of the population as data on these factors are unavailable.

## Where do I go for more information?

For more information on relative workforce supply, see *Spatial distribution of the supply of the clinical health workforce 2014: relationship to the distribution of the Indigenous population*.

For related reports, see *Spatial variation in Aboriginal and Torres Strait Islander women's access to 4 types of maternal health services*, *Spatial variation in Aboriginal and Torres Strait Islander people's access to primary health services* and *Access to primary health care relative to need for Indigenous Australians*.

See also supplementary document S6.9 'Estimating the supply of the health workforce' available online at <[www.aihw.gov.au/reports/australias-health/australias-health-2018/related-material](http://www.aihw.gov.au/reports/australias-health/australias-health-2018/related-material)>.



## References

Dental Board of Australia 2015. Registration standards. Viewed 11 September 2015, <<http://www.dentalboard.gov.au/Registration-Standards.aspx>>.

Department of Health 2013. National Aboriginal and Torres Strait Islander Health Plan 2013–2023. Canberra: Department of Health.

Li SQ, Gray NJ, Guthridge SL & Pircher SLM 2009. Avoidable hospitalisation in Aboriginal and non-Aboriginal people in the Northern Territory. *Medical Journal of Australia* 190(10):532–6.



# Chapter 7

## Prevention, treatment and health services



## 7.0 Overview

A fundamental aim of any health system is to prevent disease and reduce ill health. Australia has a large and complex network of health providers and services, not all of which can be featured in this report. This chapter presents information on health promotion and specific prevention services, primary health care, hospitals and selected specialised treatment services. It also looks at the coordination of health care and the use of patient reported measures to improve the quality of health services, patient experiences and patient outcomes. This overview highlights some, but not all, of the topics presented in this chapter.

Health promotion plays an important role in preventing disease and injury. It can help to build social and physical environments that support healthy behaviours. Two of the biggest health promotion success stories in Australia have been the reductions in road deaths since the 1970s, and in smoking rates since the 1990s.

Other key preventive measures are immunisation, disease screening, and programs aimed at preventing suicide. Immunisation in Australia begins at birth, with routine vaccines provided against 16 diseases, including measles, mumps and whooping cough. More than 90% of all children had received all the scheduled vaccinations at the ages of 1, 2 and 5. Immunisation is a safe and effective way to protect against harmful communicable diseases at the population level.

Population-based cancer screening is another major area of health prevention, through national programs for breast, cervical and bowel cancers. Rates of participation in the three programs were 55% of the target population for breast cancer screening, 55% for cervical cancer screening and 41% for bowel cancer screening.

Suicide is a serious public health problem in Australia. A wide range of programs and services are available: some have suicide prevention as a core goal; others work either to reduce known risk factors for suicide or suicidality or to provide emergency medical care (for example, ambulance services). Suicide prevention-specific initiatives range from universal activities delivered to the whole population—regardless of their level of suicide risk—to acute care provided to people at imminent risk of suicide, and to follow-up after suicide attempts.

Medicines, too, play an important preventive role in the everyday lives of Australians. They are also designed to treat and cure disease and health conditions. Some medicines are available by prescription only from a health professional; others can be bought over-the-counter in places like pharmacies and supermarkets. In 2016–17, more than 280 million prescriptions were subsidised by the Australian Government under the Pharmaceutical Benefits Scheme (PBS). Medicines to treat cardiovascular conditions were the most common, accounting for 88.4 million dispensed prescriptions. The Australian Government spent about \$12 billion on PBS medicines in 2016–17.

Primary health care is typically the first point of contact people have with the health system in Australia, often delivered by a general practitioner (GP). But primary health care also includes allied health professionals, community health workers, nurse practitioners, pharmacists, dentists, Aboriginal and Torres Strait Islander health practitioners and midwives.

A sizeable proportion of health care services are delivered in primary health settings. In 2014–15, 85% of Australians had seen a GP in the last 12 months, 47% had seen a dentist, and 28% had seen another primary health professional such as a pharmacist (8.1%), physiotherapist (8.0%) or an optician or optometrist (6.5%). On average, people are using more primary health services than they were 10 years ago.

Hospitals are also an integral part of our health system. Australia has more than 1,300 public and private hospitals collectively providing about 30 million days of patient care a year. Emergency departments in public hospitals respond to about 21,000 presentations a day—or 7.8 million a year. People aged 65 and over, children aged under 5 and Indigenous Australians are over-represented in emergency department presentations, compared with their representation in the Australian population. Nearly one-third (31%) of emergency patients are admitted to hospital for further care.

Some people admitted to hospital need surgery. About two-thirds of elective surgery (that is, planned surgery) in Australia is performed in private hospitals. Patients undergoing elective surgery in public hospitals are clinically assessed, then placed on a waiting list. In 2016–17, the median waiting time was 38 days.

In 2015–16, 4.5 million (42%) of the 10.6 million services for admitted patients in both public and private hospitals were at least partially funded through private health insurance. In public hospitals, 14% of admissions were at least partially funded by private health insurance; in private hospitals, 83% of admissions were partially funded.

In Australia, the clear majority (97%) of the more than 300,000 births in 2015 occurred in a hospital (around three-quarters in public hospitals and one-quarter in private hospitals). One-third (33%) of babies born were delivered by caesarean section—the eighth highest rate among 33 of the 35 member countries of the Organisation for Economic Co-operation and Development reporting data.

The Australian health system also provides specialised treatment services to help people with a broad range of health concerns, including mental illness and alcohol and drug use. In 2015–16, about \$9 billion was spent on services related to mental health, more than half (\$5.4 billion) of which was for state and territory specialised services. In 2015–16, GPs provided almost one-third (31%) of the 11.1 million services related to mental health that were subsidised by Medicare—and state and territory community mental health services a further 9.4 million contacts.

Alcohol is the most common principal drug of concern for people seeking help at alcohol and drug treatment services—32% of treatment episodes are for alcohol. However, over the past five years, the percentage of clients seeking alcohol treatment services has fallen slightly.

Health systems can be difficult to navigate, especially for people with multiple conditions or complex, long-term health care needs. Coordinating care so relevant information is transferred between providers (for example, a GP and a specialist) and settings (for example, an emergency department and primary health care) is crucial if a patient is to receive consistent, cohesive care. Based on self-reported survey results, an estimated 98% of people had a usual GP or usual place of care, and 65% of people with a usual GP had been going to their GP for 5 or more years. Overall, people were positive about their experiences—96% reported receiving excellent, very good or good quality of care.

# 7.1 Health promotion

Our health behaviours—whether we smoke, drink alcohol, are immunised, have a healthy diet or undertake regular physical activity—play a leading role in how healthy we are. A major aim of the health care system is to positively influence our health behaviours to prevent disease and reduce ill health.

Health promotion is a broad term. It encompasses activities that help communities and individuals to increase control over their health behaviours. It focuses on preventing the root causes of ill health—rather than on treatment and cure—and incorporates elements of governance (actions by government, for example legislation and taxes), health literacy and population health programs (for example, through public awareness campaigns) (see Chapter 4.3 'Health literacy'), and urban planning (WHO 2016).

To change a health behaviour, a mix of interventions are often used for greater effectiveness. An example is the comprehensive range of tobacco control measures implemented in Australia, which include: health warnings on tobacco packaging; the requirement for tobacco products to have plain packaging; prohibitions on tobacco advertising, promotion and sponsorship; smoking restrictions in public places; anti-smoking social marketing campaigns; and tobacco excise (tax) increases.

## Health promotion in Australia

Australia has a long history of health promotion (Box 7.1.1), with health promotion initiatives implemented by all levels of government and non-government organisations. Activities include direct interventions aimed at immediate change, and those that aim to educate and indirectly influence behaviour over the long term.

### Box 7.1.1: Selected history of health promotion in Australia

#### Governance

1932–present: School-based diphtheria vaccination programs undertaken. Diphtheria vaccination continues to be on the childhood immunisation schedule.

1951–1973: After the *State Grants (Milk for School Children) Act* was passed in 1950, states and territories provided free milk to children in schools in a bid to improve their diet.

1953–present: Fluoridated water was first introduced to Australia (Beaconsfield, Tasmania) in 1953. All states and territories currently fluoridate their drinking water (coverage varies).

1973–present: All states and territories require fitted seatbelts to be worn in motor vehicles, and helmets for motorcycle riders and passengers.

1997–present: The Immunise Australia Program was introduced in 1997, which funds the purchase of vaccinations for Australians. Routine immunisation began in the 1950s, with the first nationally funded infant program in 1975.

*continued*

### **Box 7.1.1 (continued): Selected history of health promotion in Australia**

2006–present: The requirement for graphic health warnings on tobacco product packaging was implemented in 2006; this was expanded in 2012 to include an increase in the size of the warning.

2009–present: Food Standards require folic acid to be added to bread-making flour and iodine to bread via iodised salt.

2012–present: Plain packaging legislation stipulates that all retail packaged tobacco products must be supplied in plain packaging.

2016–present: The Drug and Alcohol Program funds a range of drug and alcohol treatment, prevention and national leadership activities.

2016–present: The Healthy Food Partnership aims to make healthier food choices easier, with initiatives based on portion size, reformulation, and communication and education.

#### **Health literacy and population health programs**

1975–1981: 'Life. Be in it' was an Australian Government program and advertising campaign encouraging Australians to be more active.

1981–present: The 'Slip, Slop, Slap' campaign aimed to modify sun protection attitudes and behaviour. The message was changed to 'Slip, Slop, Slap, Seek, Slide' in 2007.

1987: The 'Grim Reaper' television advertisements aimed to shock Australians into discussions about HIV transmission.

1989–2015: The Heart Foundation 'Tick Program' aimed to help consumers make healthier food choices. Following the introduction of the 'Health Star Rating System' (see below), the Heart Foundation retired the Tick Program and it is currently being phased out on products.

1997–2004: The 'Every cigarette is doing you damage' campaign featured graphic advertisements of the damage done by cigarette smoking.

2000–present: The 'Good Sports Program', run by the Alcohol and Drug Foundation, aims to change the alcohol drinking culture among sporting clubs.

2010–present: 'Hello Sunday Morning' is an initiative that uses technology to support individuals in changing their relationship with alcohol.

2014–present: The 'Health Star Rating' is a front-of-pack labelling system that displays a standard way to compare the nutritional value of similar products.

2016–2017: 'Girls Make Your Move' is a recent Australian Government campaign that aimed to encourage girls and young women aged 12–19 to be more active.

#### **Urban planning**

2005–2010: VicHealth's 'Food for All' program aimed to enhance access to nutritious food through integrated planning of factors that influence access to food: transport, housing, economic development and land use.

Current: Housing developments are being designed with health at the centre of planning, such as the Selandra Rise development on the outskirts of Melbourne. The Heart Foundation's 'Healthy Active by Design' website has been designed to help incorporate health into the design of our built environment.



## Success stories

Two of the biggest health promotion success stories in Australia have been reductions in road deaths, from 30 per 100,000 population in 1970 to 5.4 per 100,000 population in 2016 (BITRE 2010, 2017) and daily tobacco smoking rates, from 24.3% in 1991 to 12.2% in 2016 for people aged 14 and over. There have, however, been other notable successes.

Mandatory folic acid fortification was introduced in Australia in 2009 to help prevent neural tube defects (serious birth defects). Following this initiative, the rate of neural tube defects fell (to 2011) by 14.4%. The decrease was largest for teenagers (54.8% reduction) and Aboriginal and Torres Strait Islander women (74.2% reduction). The reduction in neural tube defects in the Indigenous population is of particular note given that previous strategies to increase folic acid intake and reduce neural tube defects in this population were unsuccessful.

Australia's immunisation program has successfully reduced the incidence of harmful infectious diseases. Since routine immunisations were started in Australia in the 1950s, death and disability from many once-common infectious diseases (such as polio and diphtheria) are now rare (Department of Health 2013). Examples of successes following more recent additions to the vaccination schedule include a reduction in hospitalisations and deaths due to rotavirus (a cause of gastroenteritis) (Reyes et al. 2017), and a reduction in morbidity due to varicella (chickenpox) (Sheridan et al. 2017) (see Chapter 7.2 'Immunisation and vaccination').

### What is missing from the picture?

Monitoring and evaluation are important to assess the performance of health promotion initiatives. Monitoring relies on available data to determine who is most affected by a health problem, and whether the situation changes after intervention. While data are available to help with monitoring some specific interventions, more work could be undertaken for systematic monitoring of health promotion initiatives in Australia.

### Where do I go for more information?

For more information on health promotion in Australia, see the Australian Health Promotion Association website: <[www.healthpromotion.org.au](http://www.healthpromotion.org.au)>.

For information on the global campaign for health promotion as a major health strategy, or for the principles of health promotion, see the World Health Organization website: <[www.who.int/healthpromotion](http://www.who.int/healthpromotion)>.

### References

- BITRE (Bureau of Infrastructure, Transport and Regional Economics) 2010. Road deaths in Australia 1925–2008. Canberra: BITRE.
- BITRE 2017. Road trauma in Australia, 2016: statistical summary. Canberra: BITRE.
- Department of Health 2013. National Immunisation Strategy for Australia, 2013–2018. Canberra: Department of Health.
- Reyes J, Wood J, Beutels P, Macartney K, McIntyre P, Menzies R et al. 2017. Beyond expectations: post-implementation data shows rotavirus vaccination is likely cost-saving in Australia. *Vaccine* 35:345–52.
- Sheridan S, Quinn H, Hull B, Ware R, Grimwood K & Lambert S 2017. Impact and effectiveness of childhood varicella vaccine program in Queensland, Australia. *Vaccine* 35:3490–7.
- WHO (World Health Organization) 2016. What is health promotion? World Health Organization. Viewed 6 November 2017, <<http://www.who.int/features/qa/health-promotion/en/>>.



## 7.2 Immunisation and vaccination

Immunisation is a safe and effective way to protect against harmful communicable diseases and, at the population level, prevent the spread of these diseases among the community. In Australia, routine immunisation begins at birth, and includes vaccines against 17 diseases, including measles, mumps and whooping cough (Department of Health 2018b).

The Australian Government funds a range of vaccinations for eligible people under the Immunise Australia Program. The influenza vaccine, for example, is available, for free, to pregnant women, Aboriginal and Torres Strait Islander people, people aged 65 and over, and people who are medically at risk and thus more likely to experience complications from influenza. Additional vaccines may also be funded through state and territory programs, through the workplace and bought privately by prescription.

For immunisation to have the greatest benefit, a large proportion of the community must be fully immunised. In the past, target coverage rates have been around 90%, with these rates for children being largely achieved. However, due to a higher level of vaccine coverage needed to achieve community immunity for measles, an aspirational national immunisation target has been set at 95% of all children to be fully immunised (Department of Health 2018a).

### Childhood immunisation rates

All Australian children are expected to have received specific immunisations by a certain age according to the National Immunisation Program Schedule. 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.

In 2016, the immunisation rate for all children aged 1 was 93.4%; it was 91.4% for 2-year olds and 93.2% for 5-year-olds.

For Indigenous children in 2016, the national immunisation rates for children aged 1 and 2 were lower than the rates for all children. In contrast, the immunisation rate for 5-year-old Indigenous children was higher than the rate for all children (95.2% compared with 93.2%) (Table 7.2.1).

**Table 7.2.1: Proportion of children assessed as fully immunised (per cent), by age, 2016**

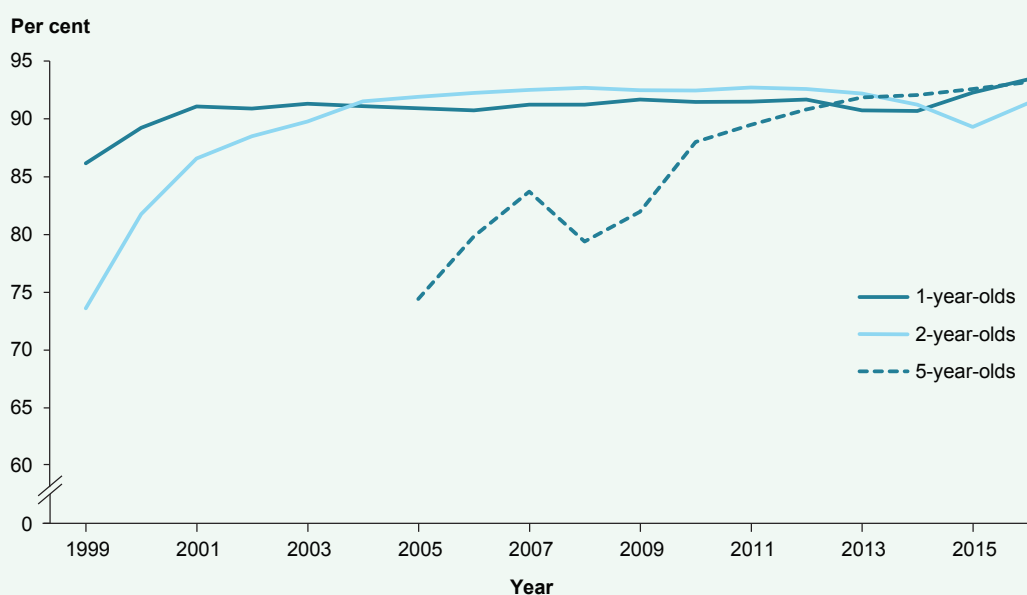
	Age		
	1	2	5
<b>All children</b>	93.4	91.4	93.2
<b>Indigenous children</b>	91.2	89.1	95.2

Source: Department of Health 2017.

Figure 7.2.1 presents the immunisation rates for children aged 1 and 2 from 1999 to 2016 and for children aged 5 from 2005 to 2016. It shows that the immunisation rate for:

- 1-year-olds remained relatively stable between 2001 and 2012. The slight fall in the rate for 2013 and 2014 may have been due to a change in the definition of 'fully immunised'
- 2-year-olds increased markedly from 1999 to 2004 and remained relatively stable above 90% until 2013. Changes in the definition of 'fully immunised', made in 2014, may have contributed to the drop in 2015
- 5-year-olds increased from 74.4% in 2005 to 93.2% in 2016. Children who have had catch-up immunisations are included as 'fully immunised' even if they were not fully immunised when they were aged 1 or 2.

Figure 7.2.1: Immunisation rates for children aged 1, 2 and 5, 1999 to 2016



Source: Department of Health 2017; Table S7.2.1.

## Human Papillomavirus immunisation rates

A national Human Papillomavirus (HPV) vaccination program (using the quadrivalent HPV vaccine, which protects against four types of HPV) was introduced for school-aged girls in 2007 and extended to boys in 2013. From 2018, a new vaccine will be introduced, protecting against nine types of HPV. Of young people turning 15 in 2016, around 79% of girls and nearly 73% of boys were fully immunised against HPV (NHVPR 2017).

## What is missing from the picture?

Until now there has been no regular and nationally consistent source of data with which to estimate vaccination coverage in adolescents and adults. Population surveys have previously been used to estimate vaccination coverage in the adult population or in selected population groups.

The Australian Immunisation Register is a national register that details all funded vaccinations and most privately purchased vaccines given to individuals of all ages who live in Australia. It was set up in 1996 as the Australian Childhood Immunisation Register and renamed following its expansion in 2016. Adult vaccination data captured in the register will be reported when reliable estimates can be obtained (Department of Human Services 2017).

## Where do I go for more information?

Australia generally has high immunisation rates, which have increased steadily over time; however, variation still exists across local areas. More information on immunisation at the local level is available at <[www.myhealthycommunities.gov.au](http://www.myhealthycommunities.gov.au)>.

More information on the Immunise Australia Program is available at <[www.immunise.health.gov.au](http://www.immunise.health.gov.au)>.

## References

Department of Health 2017. AIR—annual coverage historical data. Canberra: Department of Health. Viewed 29 November 2017, <<http://www.immunise.health.gov.au/internet/immunise/publishing.nsf/Content/acir-ann-cov-hist-data.htm>>.

Department of Health 2018a. Immunisation coverage rates are improving. Canberra: Department of Health. Viewed 4 April 2018, <<https://beta.health.gov.au/news-and-events/news/immunisation-coverage-rates-areimproving>>.

Department of Health 2018b. What is immunisation? Canberra: Department of Health. Viewed 4 April 2018, <<https://beta.health.gov.au/topics/immunisation/getting-started/what-is-immunisation>>.

Department of Human Services 2017. About the Australian Immunisation Register. Canberra: Department of Human Services. Viewed 18 April 2018, <<https://www.humanservices.gov.au/individuals/enablers/about-air>>

NHVPR (National HPV Vaccine Program Register) 2017. Coverage data. Melbourne: NHVPR. Viewed 9 January 2018, <<http://www.hpvregister.org.au/research/coverage-data>>.

## 7.3 Suicide prevention activities

Suicide prevention activities in Australia are complex. Government agencies, service providers and the non-government sector all have interconnected responsibilities. Although these activities are a priority area under the 5th National Mental Health and Suicide Prevention Plan, there is currently limited published information on government investment in suicide prevention and the resulting service activity at the national and jurisdictional level (often delivered by non-government organisations). This snapshot provides an overview of available data for this investment and activity and outlines potential areas for improved data collection and reporting.

### How common is suicide and suicidality?

Suicide is a major public health problem, both in Australia and internationally. According to the AIHW's Australian Burden of Disease Study, suicide and self-inflicted injuries are the fourth leading cause of fatal burden of disease in Australia, accounting for 4.9% of the fatal burden of disease in 2011. In 2012, it was estimated that the economic cost of suicide death in Australia was \$1.7 billion (KPMG 2013).

Despite ongoing efforts to improve suicide prevention initiatives, the age-standardised suicide rate of both males and females shows an overall increase from 2007 to 2016, from 16 to 18 per 100,000 population for males and 5 to 6 per 100,000 population for females. Aboriginal and Torres Strait Islander people remain disproportionately affected by suicide. In 2016, the age-standardised suicide rate for Indigenous people was 24 per 100,000 population—twice the rate for the non-Indigenous population, at 12 (ABS 2017).

Suicidal ideation, suicide plans and suicide attempts—collectively called 'suicidality'—are more common than suicide deaths and can have a profound impact on individuals, families, communities and society. The 2007 National Survey of Mental Health and Wellbeing estimated that, at some point in their lives, 13% of Australians aged 16–85 have experienced suicidal ideation, 4.0% have made suicide plans and 3.3% have attempted suicide (Slade et al. 2009).

### How much do governments spend on suicide prevention activities?

The Australian Government's total expenditure under the National Suicide Prevention Strategy (NSPS) increased from \$1.9 million in 1995–96 to \$49.1 million in 2015–16. The Australian Government also contributes to suicide prevention through investments in broader programs and services for homelessness, Indigenous health, employment, education, community welfare, drugs and alcohol, and mental health.

State and territory governments also fund initiatives under their own suicide prevention strategies. This expenditure is currently not publicly reported in a consolidated form by all jurisdictions.

# Types of suicide prevention activities

The causes of suicide and suicidality are complex and multifaceted. There are therefore a wide range of suicide prevention programs and services, some of which have suicide prevention as a core goal (for example, gatekeeper training), and others to reduce known risk factors for suicide or suicidality, or to provide emergency medical care (for example, ambulance services, see Box 7.3.1). These types of programs and services can be referred to as 'suicide prevention-specific' and 'suicide prevention-related', respectively.

Suicide prevention-specific initiatives range from universal activities (those delivered to a whole population, regardless of their level of suicide risk), to acute care provided to people at imminent risk of suicide, and to follow-up after suicide attempts and postvention (intervention after a person's suicide to support that person's family, friends and peers).

## Box 7.3.1: Ambulance attendances in Victoria

Ambulance services may provide a pathway to hospital care for people at risk of suicide. In 2013, data were collected on suicide-related ambulance attendances in five states and territories for a pilot surveillance system for cases related to suicide, self-harm, overdose and mental health. Data from Victoria cover the full 12 months. Over this period, Victoria reported ambulance attendance at 150 suicide deaths, 6,500 suicide attempts, and 7,300 cases of suicidal ideation without suicide attempt. The patient was transported to hospital in 99% of suicide attempt attendances and 97% of suicidal ideation attendances (Lloyd et al. 2015).

People may also present to emergency departments either by ambulance or by other means; however, the current national emergency department data collection lacks the specificity to report accurately on this activity.

Comprehensive data are not available on how many suicide prevention-specific and suicide prevention-related initiatives and services operate in Australia. However, from 1999 to 2005, the NSPS funded 156 local suicide prevention projects (Headey et al. 2006); around 50 projects were funded under the NSPS and Taking Action to Tackle Suicide package from 2006–07 to 2012–13 (AHA 2014).

## Admitted hospital care

Suicidal ideation or suicide attempts may result in admission to hospital for specialised mental health care. National admitted hospital data cannot be used to distinguish between suicidal ideation, non-suicidal self-injury and suicide attempts, so activity relating to these types of presentations is collectively reported as intentional self-harm.

In 2015–16, more than 32,900 separations (32,780 public hospital separations and 128 private hospital separations) had a principal diagnosis of injury or poisoning related to intentional self-harm. Indigenous patients were over-represented among these, making up 8.2% of hospitalisations for intentional self-harm. There has been minimal variation in the number of separations for intentional self-harm over the 5 years to 2015–16.

## Psychological services

The Access to Allied Psychological Services program enables a range of health, social welfare and other professionals to refer consumers who have been diagnosed with a mild to moderate mental disorder to a mental health professional for short-term focused psychological services. In 2015–16, more than 7,200 people accessed suicide prevention initiatives (7,000 suicide prevention services and 200 services specifically for Indigenous people). Collectively, these consumers were provided almost 42,700 sessions (an average of 6 sessions per consumer), and 480 consumers (6.6% of consumers accessing the initiative) received 13–18 sessions.

## Postvention services

Postvention services, as mentioned earlier, support and assist people who have been exposed to or bereaved through suicide, to help reduce their distress and the risk of 'suicide contagion' (AHA 2014). An example of a postvention service provider is headspace's School Support, which, in 2015–16, worked with more than 1,600 Australian school communities to prepare for, respond to and recover from a suicide (headspace 2016).

## Teleweb services

Teleweb services provide telephone or web-based crisis support, or self-help programs. Several teleweb services provide suicide prevention services in Australia. The biggest of these is Lifeline which, in 2016–17, received about 933,400 calls through its telephone crisis support line—an average of about 2,600 calls per day. For around 130 calls per day, the person seeking help was considering suicide now or in the future; for about 105 of these calls, safety plans were created to help the caller to manage their suicidality and take steps to recovery. Lifeline also had about 46,200 conversations through its Online Crisis Support Chat service, around 42% of which identified suicide as a safety issue (Lifeline Australia 2017).

## What is missing from the picture?

Currently, data on suicide prevention expenditure, program and service activity are not systematically collected and publicly reported at the national and jurisdictional levels. Australian Government expenditure under the NSPS is reported annually, but there is limited reporting on the number and type of services resulting from this investment. State and territory governments complement Australian Government initiatives with their own suicide prevention plans, designed to meet local needs, but data on the expenditure and service activity for these plans are not publicly reported in any state or territory.

In February 2017, the Australian Government announced that 12 Primary Health Networks (PHNs) would be given responsibility for conducting suicide prevention trials to strengthen mental health care and suicide prevention in their region. Data collected on the suicide prevention activities of these PHNs are expected to be publicly reported in 2019–20.

Hospital emergency departments are important points of contact for many people experiencing suicidal crisis. However, existing national emergency department data collections cannot currently be used to reliably report on suicide or presentations related to intentional self-harm. Some states and territories have undertaken data linkage to better understand emergency department response to suicide-related activity. Currently, there is no data source to routinely report on the activities of first responders across Australia—including ambulance attendances—for self-harm or suicide behaviours (Box 7.3.1 describes a pilot surveillance project for this data).

A number of states and territories have also created suicide registers to glean more detailed information on individuals who died from suicide; however, there is no nationally consistent approach to reporting this information at this time.

The inclusion of suicide in the 5th National Mental Health and Suicide Prevention Plan, and the commitment to better the quality of care for individuals who present to hospital after a suicide attempt, provide key opportunities to improve the collection and reporting of data on suicide prevention activities and to enhance understanding of suicide prevention needs and subsequent outcomes for Australians.

## Where do I go for more information?

The 5th National Mental Health and Suicide Prevention Plan is available on the Council of Australian Governments Health Council website.

More information about suicide deaths is available in the Australian Bureau of Statistics report *Causes of death, Australia, 2016*.

More information about mental health expenditure and service data is available in the AIHW report *Mental Health Services in Australia*.

If you or someone you know needs help please call:

**Lifeline 13 11 14**

**beyondblue 1300 22 4636**

**Kids Helpline 1800 55 1800**

## References

- ABS (Australian Bureau of Statistics) 2017. Cause of death, Australia, 2016. ABS cat. no. 3303.0. Canberra: ABS.
- AHA (Australian Healthcare Associates) 2014. Evaluation of suicide prevention activities: final report. Melbourne: AHA.
- Headey A, Pirkis J, Merner B, VandenHeuvel A, Mitchell P, Robinson J et al. 2006. A review of 156 local projects funded under Australia's National Suicide Prevention Strategy: overview and lessons learned. Australian e-Journal for the Advancement of Mental Health 5:1–15.
- headspace (National Youth Mental Health Foundation) 2016. Annual report 2015–16. Melbourne: headspace.
- KPMG Health Economics 2013. The economic cost of suicide in Australia. Canberra: Menslink.
- Lifeline Australia 2017. Annual report 2016–17. Canberra: Lifeline Australia.
- Lloyd B, Gao CX, Heilbronn C & Lubman DI 2015. Self harm and mental health-related ambulance attendances in Australia: 2013 data. Fitzroy, Victoria: Turning Point.
- Slade T, Johnston A, Teesson M, Whiteford H, Burgess P, Pirkis J et al. 2009. The mental health of Australians 2: report on the 2007 National Survey of Mental Health and Wellbeing. Canberra: Department of Health and Ageing.

## 7.4 Cancer screening

Population-based cancer screening is an organised, systematic and integrated process of testing for signs of cancer or pre-cancerous conditions in populations without obvious symptoms. In Australia, there are national population-based screening programs for breast, cervical and bowel cancers. They are run through partnerships between the Australian Government and state and territory governments. The programs target particular populations and age groups where evidence shows screening is most effective at reducing cancer related morbidity and mortality.

### BreastScreen Australia

BreastScreen Australia, established in 1991, provides free 2-yearly screening mammograms (see Glossary) to women aged 40 and over, and actively targets women aged 50–74.

- In 2015–2016, nearly 1.8 million women aged 50–74 participated in BreastScreen Australia—around 55% of the target population.
- Participation is lower among Aboriginal and Torres Strait Islander women, at around 37% of the Indigenous population, as well as among women living in *Very remote* areas (47%) and women from a culturally or linguistically diverse background (48%).
- More than half (59%) of all breast cancers detected through BreastScreen Australia are small ( $\leq 15$  mm); small breast cancers are associated with more treatment options and improved survival.

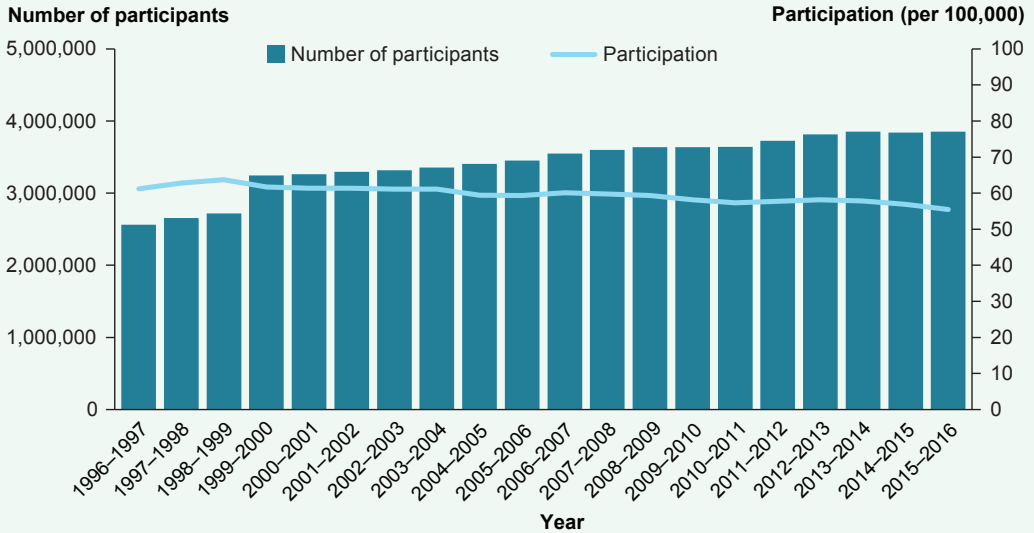
### National Cervical Screening Program

Before 1 December 2017, the National Cervical Screening Program (NCSP), established in 1991, targeted women aged 20–69 for a 2-yearly Papanicolaou smear, or 'Pap test' (see Glossary).

- In 2015–2016, more than 3.8 million women aged 20–69 participated in the NCSP—around 55% of the target population. This equates to an age-standardised rate of 56%. This rate was a slight fall on what had been a relatively steady rate since 2004–2005—around 58–60% (Figure 7.4.1).
- Participation varies across remoteness areas. It is highest in *Inner regional* areas (57%) and lowest in *Very remote* locations (46%); it increases with increasing socioeconomic position (from 50% in the lowest socioeconomic area to 62% in the highest area).
- For every 1,000 women screened, around 7 have a high-grade abnormality detected, providing an opportunity for treatment before possible progression to cervical cancer.



**Figure 7.4.1: Number of participants and age-standardised participation rate (per cent) of women aged 20–69 in the NCSP, 1996–1997 to 2015–2016**



*Note:* Rates from 1996–1997 to 2003–2004 are not directly comparable with rates from 2004–2005 onwards, because a different source of hysterectomy fractions was used to adjust the population.

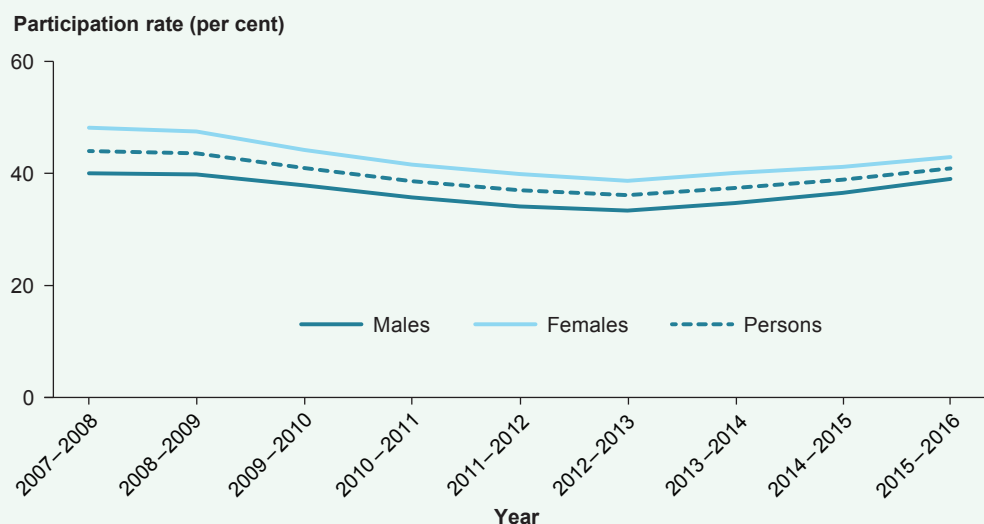
*Source:* AIHW analysis of state and territory cervical screening register data; Table S7.4.1.

## National Bowel Cancer Screening Program

The National Bowel Cancer Screening Program (NBCSP) was established in 2006. In 2014, the Australian Government announced that it would be expanded and, once fully implemented in 2020, would offer free 2-yearly screening for all Australians aged 50–74. The program currently targets men and women turning 50, 54, 58, 60, 62, 64, 66, 68, 70, 72 and 74, and invites them to screen for bowel cancer using a free immunochemical faecal occult blood test (iFOBT) (see Glossary). In 2015–2016, nearly 3.2 million people were invited to participate in the program. Of these:

- about 1.3 million returned a completed iFOBT kit for analysis—a participation rate of 41%. Participation was higher among women (43% of all women invited) than men (39%) (Figure 7.4.2)
- of participants who underwent a colonoscopy in 2016 after a positive screen, 1 in 29 (3.8%) were diagnosed with a confirmed or suspected bowel cancer, and 1 in 17 (6.0%) were diagnosed with an advanced adenoma (pre-cancerous tumour)
- the participation rate has remained relatively stable for men and women combined over time; it started at 44% in 2007–2008, decreased to 36% in 2012–2013 then increased to 41% in 2015–2016 (Figure 7.4.2).

Figure 7.4.2: Participation rate (per cent), National Bowel Screening Program, 2007–2008 to 2015–2016



Notes

1. Data presented are for rolling 2-year participation periods.
2. Trend data use the performance indicator specifications retrospectively on previous years' data.

Source: NBCSP Register, as at 30 June 2017; Table S7.4.2.

## What is missing from the picture?

National cancer data do not reveal if a new case of cancer was identified through screening. This information can currently only be collated using probabilistic data linkage. Participation in cervical screening cannot be measured nationally for Indigenous women because Indigenous status is not included on all pathology forms in all states and territories (the only source of information for cervical screening registers). However, available evidence on participation in cervical screening by Indigenous women suggests that Indigenous women are under-screened.

## Where do I go for more information?

The *BreastScreen Australia monitoring report 2014–2015*, *Cervical screening in Australia, 2018*, and *National Bowel Cancer Screening Program: monitoring report 2018* are available for free download.

## 7.5 Primary health care

Primary health care is the frontline of Australia's health care system. It is typically the first point of contact people have with the health system and includes a broad range of services delivered outside the hospital that generally do not need a referral. Many Australians receive most of their primary health care through their general practitioners (GPs), although primary health care providers also include allied health professionals, community health workers, nurses, pharmacists, dentists, midwives and Aboriginal and Torres Strait Islander health workers and practitioners (Department of Health 2013).

Primary health care providers deliver a wide range of services to the community, including health promotion and prevention, early intervention, treatment of acute conditions and management of chronic conditions. While the bulk of these services are subsidised under Medicare—a universal public insurance scheme—all levels of government, as well as many private and non-government organisations, are involved in funding and delivering primary health care. See Chapter 2.1 'How does Australia's health system work?' for more information.

Primary health care aims to improve the overall health of the population by providing a consistent point of care across people's life span that is tailored to patients' needs and coordinated with the rest of the health system. Effective primary health care can improve outcomes at a lower cost than for hospital and secondary care, and help to avoid unnecessary hospitalisations (OECD 2017).

Australia's primary health care system faces several ongoing challenges. These include inequalities in access to effective and coordinated care, as well as increasing demand (due to an ageing population and rising levels of chronic conditions and risk factors). Yet, despite its importance, the availability of reliable high-quality data on our primary health care system is limited. This makes it difficult to assess its performance with the same rigour as applied for hospital care, and to identify and monitor areas where improvements are needed.

This article provides an overview of Australia's primary health care sector, with a focus on the scale, type and accessibility of GPs, allied health and dental care. It also includes some information on the role that primary health care providers play in referring patients and supporting their access to other non-hospital ('secondary') health care, such as specialist doctors.

### What is the scale and nature of primary health care in Australia?

A substantial proportion of health care services in Australia are delivered in primary health care settings. In 2015–16, primary health care accounted for 35% (or \$59 billion) of Australia's total health expenditure, while hospital services accounted for 39%, and referred medical services for 10% (AIHW 2017b). See Chapter 2.2 'How much does Australia spend on health care?' for more information.

In 2014–15, 85% of Australians saw at least one GP in the previous 12 months, 47% saw a dentist, and 28% saw another primary health professional such as a pharmacist (8.1%), physiotherapist (8.0%) or an optician or optometrist (6.5%) (ABS 2017b).

Table 7.5.1 presents an overview of the scale and type of primary health care in Australia. Over the past decade, the number of services claimed per person each year has steadily increased for most types of primary health services. This means that, on average, people are receiving more primary health care services than they were 10 years ago. More detailed information about allied health and dental services can be found in Table 7.5.2.

**Table 7.5.1: Use of primary health care (and related non-hospital services), 2007–08 and 2016–17**

Type of service	Number of services, 2016–17 (million)	Services per 100 people, 2016–17 (rate)	Change in rate since 2007–08 (%)
<b>Primary health care services</b>			
GPs	148.3	602.7	17.5 ↑
Allied health type services	71.2	289.3	43.1 ↑
Dental	45.8	186.1	..
Non-referred practice nurse	2.1	8.5	65.4 ↓
Indigenous-specific primary health care services	3.9	..	84.5 ↑
Prescriptions dispensed (PBS and RPBS)	293.1	1,191.5	..
<b>Non-hospital referred services</b>			
Pathology	120.0	487.9	20.0 ↑
Diagnostic imaging	23.7	96.4	33.5 ↑
Specialists	23.0	93.4	14.8 ↑

.. no data/insufficient data

PBS = Pharmaceutical Benefits Scheme; RPBS = Repatriation Pharmaceutical Benefits Scheme

*Note:* Excludes services delivered to admitted hospital patients. Upward-facing arrows (↑) and downward-facing arrows (↓) denote a change of at least 5.0% between 2007–08 and 2016–17. Results for Indigenous-specific primary health care services are for 2015–16 and 2008–09 as data for 2016–17 and 2007–08 were unavailable at the time of publication. The percentage increase is for the increase in number of Indigenous-specific primary health care services over the time period, not the change in rate. Detailed notes are available in Supplementary Table S7.5.1.

*Sources:* ABS 2017a; AIHW 2017a; AIHW analysis of Department of Health Medicare Benefits Schedule (MBS) data 2018; AIHW analysis of Department of Health PBS and RPBS data 2018; Australian Prudential Regulation Authority 2017; Department of Health 2017a; Table S7.5.1.

Table 7.5.1 does not include services that were completely paid for by patients or were subsidised by the Department of Veterans' Affairs (DVA), compensation arrangements or through other publicly funded programs. In 2015–16, 6.1 million GP and specialist attendances, 3.6 million allied health services and 721,000 dental services were processed by the DVA (Department of Human Services 2016). In the same year, it was estimated that 2.6% of GP encounters were not Medicare or DVA-subsidised (Britt, Miller & Henderson et al. 2016). See Chapter 5.6 'Veterans' for more information on veterans' health.

# General practitioners

GPs are the first point of contact that many Australians have with the health system for a health concern. There are currently limited national data on the health conditions for which people seek GP care, and the type of treatment given and recommended to patients.

GPs treat a broad range of health issues. Data from the final year of the Bettering the Evaluation and Care of Health (BEACH) Survey of GPs estimated that, in 2015–16, 40% of GP encounters included managing at least one chronic health problem (Britt, Miller & Henderson et al. 2016).

Problems of a general and unspecified nature—such as general check-ups, prescriptions and general immunisations—were managed at 19% of GP visits (Figure 7.5.1).

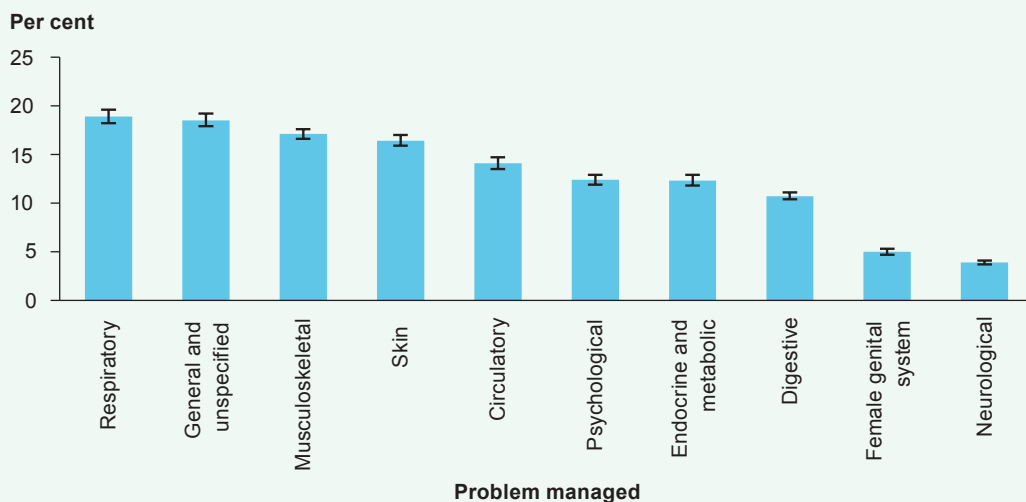
Since 2006–07, the proportion of GP encounters at which at least one psychological problem was managed has steadily increased, from 10% to 12% in 2015–16, while the proportion of GP encounters where at least one circulatory problem (such as hypertension) was managed decreased from 16% to 14% (Britt, Miller & Bayram et al. 2016).

GPs also provide urgent medical care. In 2016–17, it is estimated that 9.3% of people aged 15 and over saw a GP for urgent medical care (ABS 2017c).

In 2015–16, the main problems managed by GPs were:

- respiratory (at 19% of GP visits)
- musculoskeletal (17%)
- skin (16%)
- circulatory (14%).

**Figure 7.5.1: Proportion of GP encounters at which at least one problem was managed, by type of problem, 2015–16**



*Note:* Data are from the BEACH survey of GPs. The type of problem is categorised by the International Classification for Primary Care Version 2 (ICPC-2) chapter. Each chapter contains multiple types of related problems (for example 'Respiratory' includes upper respiratory tract infection and asthma). If two problems from the same chapter were managed at the same encounter, the occasion was counted only once. Categories are not mutually exclusive. Multiple types of problems from different ICPC-2 chapters may have been discussed at each GP encounter. The thin vertical line superimposed over the top end of each bar are 95% confidence intervals.

*Source:* Britt, Miller & Henderson et al. 2016; Table S7.5.2.

## What kind of care do GPs give?

GPs use a wide range of treatments to manage patients' health problems. These include referring patients to other health professionals for assessment, treatment and tests.

### The BEACH survey estimated that in 2015–16:

- 52% of GP visits had at least one medication prescribed
- 42% of visits involved a clinical or procedural treatment (most commonly advice or education)
- 26% of visits involved a referral for a pathology, imaging or other type of test
- 15% of visits involved a referral to specialists, allied health services, hospitals or emergency departments
- 9.3% of visits involved a recommendation for over-the-counter medications (most commonly paracetamol)
- 7.4% of visits had a vaccine or medication provided directly to the patient (most commonly the influenza virus vaccine) (Britt, Miller & Henderson et al. 2016).

More than one type of these actions occurred in under half of GP visits (45%) (Britt, Miller & Henderson et al. 2016). See Chapter 7.6 'Medicines in the health system' for more information about medicines.

GPs also play an important role in providing lifestyle advice and education to people, with an emphasis on the 'SNAP' risk factors: smoking, nutrition, alcohol and physical activity (RACGP 2015).

### In 2014–15, of people aged 15 and over:

- 14% discussed reaching a healthy weight with a GP
- 11% discussed eating healthy food or improving their diet
- 10% discussed increasing physical activity (ABS 2017b).

In the same year (2014–15), 33% of adult smokers discussed reducing or quitting smoking with a GP, 31% of adults who were obese discussed reaching a healthy weight, and 10% of adults who (on average) drank more than 2 standard drinks per day discussed drinking alcohol in moderation (ABS 2017b).

## Enhanced GP care

Medicare supports enhanced GP care of complex patients through Medicare-subsidised Enhanced Primary Care (EPC) services. In 2016–17, 12.6 million EPC GP attendances were provided to 5.2 million people (21% of all Australians) (Department of Health 2017a). These sessions involve GPs conducting thorough health checks for at-risk people, including people aged 75 and over, aged 40–49 with high risk of developing type 2 diabetes, and refugees.

EPC services also include developing and reviewing health plans for people with chronic, complex or mental health conditions. Where patients need multidisciplinary, team-based care from a GP and other health professionals—for example, specialists or allied health providers—the other health professionals are also involved in developing the patient plan. These plans provide a structured way for GPs (and, where relevant, a team of health care providers) to organise their patients' care, keep up-to-date and comprehensive information on their health and care, and help them achieve their treatment goals. The plans also allow eligible patients to access Medicare-subsidised allied health services (Department of Health 2018). See Chapter 7.18 'Coordination of health care' for more information.

## Allied health

Allied health professionals include a broad range of health practitioners who are not doctors, nurses or dentists. Allied health professionals include, but are not limited to, Indigenous health practitioners, chiropractors, occupational therapists, optometrists, osteopaths, pharmacists, physiotherapists, podiatrists, psychologists, sonographers and speech pathologists (Allied Health Professions Australia 2017).

There are limited comprehensive data on allied health services in Australia, even though it is estimated that around one-quarter of the population uses them (ABS 2017b). Australians can access subsidised allied health services through their private health insurance if they have general treatment ('ancillary' or 'extras') cover, or through Medicare where eligible (most commonly through EPC services). There has been a marked increase in the use of these allied health services over the past decade (Table 7.5.2). At present, we do not have national data on allied health services accessed outside of private health insurance or Medicare.

## Dental services

As for allied health services, there are limited national data on dental services that are not claimed through private health insurance, or (in limited circumstances) through Medicare. Use of dental services claimed through general private health insurance have increased by 35% in the last 10 years (Table 7.5.2). In June 2017, 55% of the population had general private health insurance (Australian Prudential Regulation Authority 2017) and were thus eligible to claim these dental and allied health services.

Table 7.5.2: Use of allied health and dental services, 2007–08 and 2016–17

Type of service	Number of services, 2016–17 (million)	Services per 100 people, 2016–17 (rate)	Change in rate since 2007–08 (%)
<b>Medicare-subsidised allied health services</b>			
Optometry	8.9	36.1	34.9 ↑
Mental health	5.3	21.5	132.1 ↑
Podiatry	3.0	12.3	430.8 ↑
Physiotherapy	2.2	9.0	311.6 ↑
Other	1.7	6.9	58.3 ↑
<b>Total allied health (Medicare)</b>	<b>21.1</b>	<b>85.9</b>	<b>91.1 ↑</b>
<b>General private health subsidised allied health services</b>			
Optical	11.6	47.3	54.9 ↑
Physiotherapy	11.5	46.9	34.6 ↑
Chiropractic	9.4	38.1	3.0 ~
Natural therapies	6.2	25.1	133.2 ↑
Other	11.4	46.2	4.3 ~
<b>Total allied health (general private health)</b>	<b>50.1</b>	<b>203.5</b>	<b>29.3 ↑</b>
<b>Dental</b>			
General private health insurance	40.6	164.9	35.0 ↑
Child Dental Benefits Schedule and MBS	5.2	21.2	..
<b>Total dental</b>	<b>45.8</b>	<b>186.1</b>	<b>..</b>

.. no data /insufficient data

MBS = Medicare Benefits Schedule

Note: Upward-facing arrows (↑) denote a change of at least 5.0% between 2007–08 and 2016–17. A tilde (~) denotes a change of less than 5.0% between years. Detailed notes are available in Supplementary Table S7.5.3.

Sources: ABS 2017a; AIHW analysis of MBS data set 2018; Australian Prudential Regulation Authority 2017; Department of Health 2017a; DHS 2018; Table S7.5.3.

## Access to primary health care

The Australian primary health care system aims to improve health and prevent illness by providing care that is accessible, appropriate, responsive to needs, patient-centred, high quality, safe, coordinated across the health sector, and sustainable (Department of Health 2013). See chapters 7.17 'Patient-reported experience and outcome measures', 7.18 'Coordination of health care' for more information.



Accessible primary health care is important for the early detection and treatment of risk factors and conditions, and improved health outcomes. A person's ability to access appropriate and quality primary health care is influenced by their specific health needs as well as by factors such as where they live, their socioeconomic circumstances, and their cultural background. People living in rural and remote or low socioeconomic areas, Indigenous Australians and people with disability tend to have poorer access to health care and worse health outcomes (Department of Health 2013). See Chapter 5 for information about the inequality of health outcomes across Australia.

The accessibility of primary health care is explored by looking at whether people delayed or did not use care, due to cost or other reasons, and differences in access to bulk billed services, after-hours care and telehealth services. See Chapter 2.3 'Who is in the health workforce?'; Chapter 5.2 'Rural and remote populations' for more information.

## How many people faced barriers to primary health care?

In 2016–17, of people aged 15 and over:



**26%** delayed seeing, or did not see, a GP at least once when needed, 16% of whom reported this was because of cost (4.1% of all people who needed to see a GP, or an estimated 663,000 people)



**31%** delayed seeing or did not see a dental professional at least once when needed, 60% of whom reported this was because of cost (18% of all people who needed to see a dentist, or 2 million people)



**7.3%** of people who needed a prescription medication delayed or avoided filling it due to cost (974,000 people) (ABS 2017c).

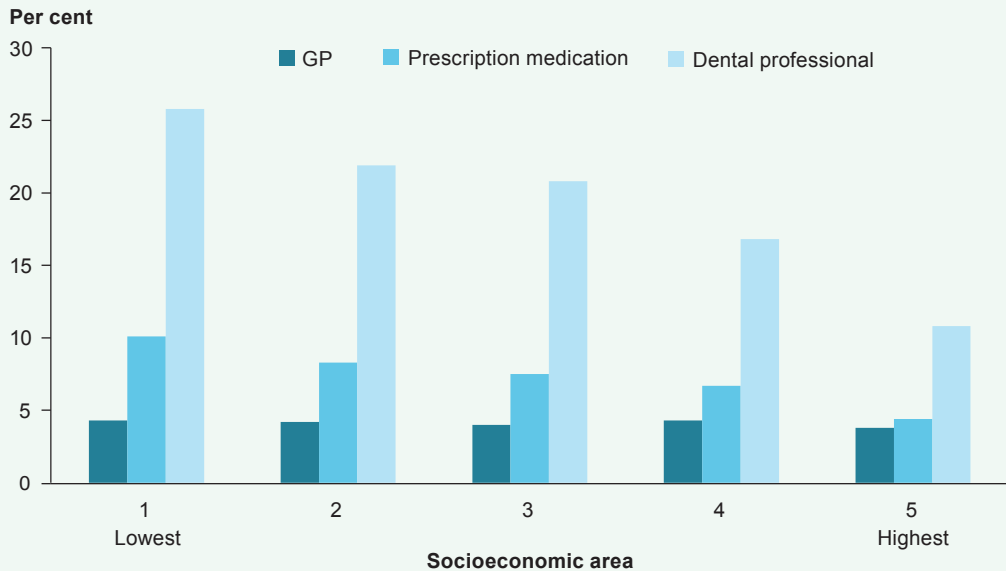
Since 2013–14, the estimated number of people who delayed or did not see a GP at least once when needed has fallen from 4.6 to 4.2 million people (ABS 2017c).

## Who faced barriers to primary health care?

There is a 'social gradient' in experiencing cost barriers to dental professionals and prescription medicines—meaning that people living in the lowest socioeconomic areas are more than twice as likely to face cost barriers to both these types of health care compared with people living in the highest socioeconomic areas (Figure 7.5.2). In contrast, across socioeconomic areas, there was little variation in the percentage of people who experienced a cost barrier to GP care (Figure 7.5.2).

Access to care was also worse for people who reported poorer health. They represented around 14% of people aged 15 and over—or 2.7 million people. People who reported their health to be fair or poor were about twice as likely to experience a cost barrier to dental professionals or prescription medicines compared with people who rated their health positively (ABS 2017c).

**Figure 7.5.2: Proportion of people aged 15 and over who delayed or did not seek care at least once when needed due to cost, by type of care and socioeconomic area, 2016–17**



*Note:* Socioeconomic areas are based on area of residence using the ABS Index of Relative Socio-Economic Disadvantage.

*Source:* ABS 2017c; Table S7.5.4.

## Access to bulk-billed services

Under Medicare, health providers can choose to bulk-bill their services. This means that the patient has no out-of-pocket costs for the service. In 2016–17, 86% of GP attendances in Australia were bulk-billed. This proportion has increased steadily from a low of 68% in 2003–04 to an all-time high in 2016–17.

The proportion of GP attendances bulk-billed across Australia varies considerably across jurisdictions, ranging from 89% in the Northern Territory to 62% in the Australian Capital Territory (Department of Health 2017a).

Bulk-billing rates have also increased for other kinds of non-hospital Medicare services, particularly non-hospital specialist attendances (32% in 2007–08 to 41% in 2016–17), diagnostic imaging (68% to 84%), and pathology (95% to 99%) (Department of Health 2017a).

## After-hours GP care

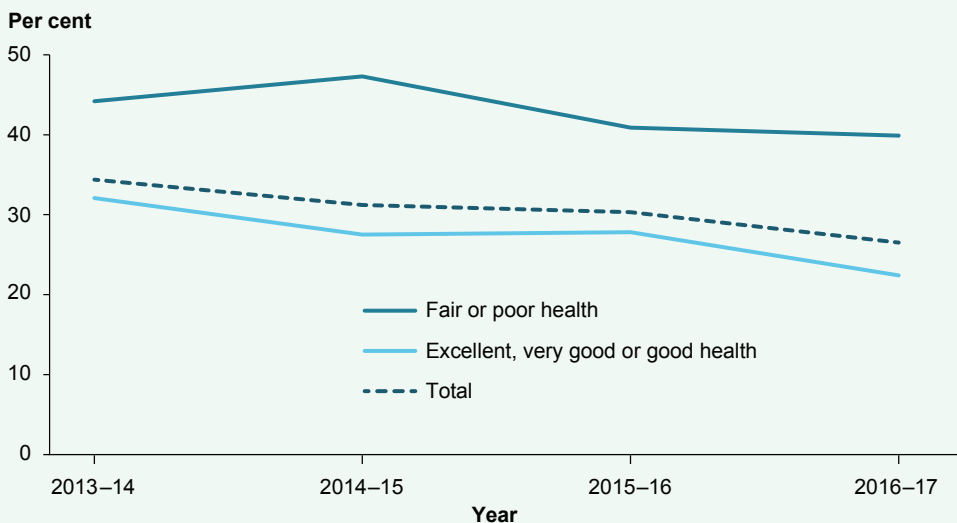
There has been considerable policy emphasis on improving access to after-hours primary health care, including access to after-hours telehealth services.

In 2016–17, 24% of Australians (5.8 million people) claimed 11.9 million after-hours GP services through Medicare. This translates into 49 after-hours GP visits per 100 people over the year. This has steadily increased, from 27 after-hours GP visits per 100 people in 2007–08 (AIHW analysis of MBS data set 2018; Supplementary Table S7.5.5). Access to after-hours GP services varies substantially across the country depending on where people live and the area's socioeconomic disadvantage (AIHW 2017c).

In 2016–17, an estimated 2 million people aged 15 and over reported that they needed to see an after-hours GP in the last 12 months (ABS 2017c). Of these people, 26% (around 528,000 people) reported that they could not do so at least once when needed. This proportion has fallen from 34% in 2013–14.

However, the rate of improvement has not been the same for all people. In 2016–17, the percentage of people who did not see an after-hours GP at least once when needed was highest for people who self-assessed their health as fair or poor (40%), and for people living in *Inner Regional* areas (37%). Since 2013–14, the percentage of people who did not see an after-hours GP when needed has improved markedly for people who rated their health as excellent, very good or good (it reduced from 32% to 22%); it has not improved as well for people who rated their health as ‘fair or poor’ (44% to 40%, Figure 7.5.3).

**Figure 7.5.3: Percentage of people aged 15 and over who did not see an after-hours GP at least once when needed, by self-assessed health status, 2013–14 to 2016–17**



Sources: ABS 2014, 2015, 2016, 2017c; Table S7.5.6.

## Telehealth

Telehealth is the delivery of health services through information and communication technologies such as videoconferencing. Improving access to telehealth services, particularly for people with chronic and mental conditions, is a key priority for Australian Government and state and territory governments (Australian Digital Health Agency 2017; Department of Health 2017b; Nous Group 2015; NSW Ministry of Health 2016).

Telehealth has the potential to tackle many challenges that Australia’s health system faces, including improving access to care for people living in rural and remote areas and for people with mobility issues. Along with opportunities stemming from the revolution in digital health technologies, advances in telehealth can provide a cost-effective way to support people with chronic conditions to more effectively self-manage their health (Box 7.5.1). See Chapter 2.4 ‘Digital health’ for information on digital health solutions.

### Box 7.5.1: Tele-monitoring systems

Tele-monitoring systems allow patients to take their own vital signs (for example, blood pressure), and then videoconference or secure message the information to their care coordinators. A 1-year trial of the use of home tele-monitoring systems by patients with chronic conditions by the Commonwealth Scientific and Industrial Research Organisation found that these systems reduced mortality by more than 40%; they also reduced the rate of hospital admissions by 53% (and reduced the rate of length of stay when admitted by almost 76%), and reduced MBS and PBS expenditure by 46% and 26%, respectively (Celler et al. 2016).

Australians can use online and telephone advice at any time via Healthdirect Australia. In 2016–17, healthdirect responded to:

- 746,000 calls to healthdirect helplines
- 75,500 calls to the after hours GP helpline
- 9.7 million online visitors
- 6,800 video calls (Healthdirect Australia unpublished data, January 2018).

In October 2014, healthdirect Video Call was launched. From 2017, healthdirect began supporting health organisations in New South Wales, Victoria and Western Australia to integrate the use of video calls with their everyday delivery of services (Healthdirect Australia 2017).

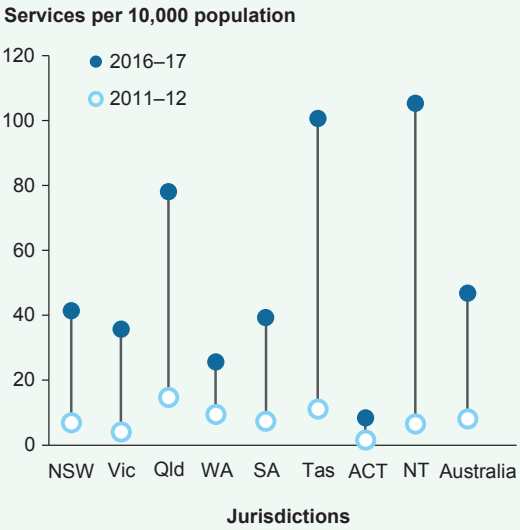
Telehealth video consultations with specialists can also be subsidised through Medicare for people in rural and remote areas, people living in residential aged care facilities and Indigenous Australians. This program expanded in November 2017 to include consultations with allied mental health professionals.

#### Patient-end telehealth support

A local primary health care worker (such as a GP, nurse or Indigenous health practitioner or worker) may be present with the patient during their video consultation with a specialist to give clinical support.

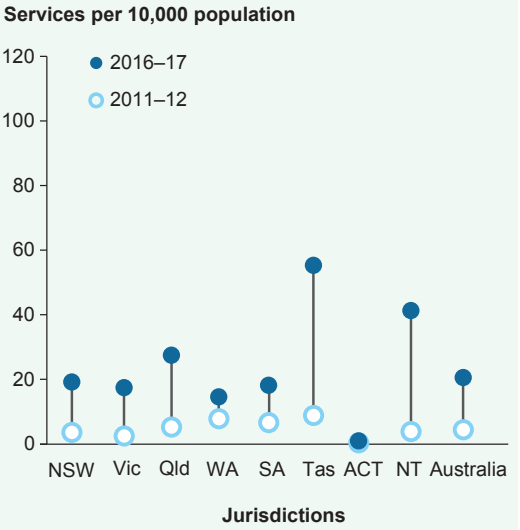
The uptake of Medicare-subsidised video conferencing has increased steadily since the introduction of Medicare rebates and incentives in 2011 (figures 7.5.4, 7.5.5). Across Australia in 2016–17, 65,000 people claimed 115,000 Medicare-subsidised video consultations with specialists and 50,500 'patient-end' support services. This represents a rate of 47 telehealth services and 21 patient-end support services per 10,000 population. These rates were highest in the Northern Territory and Tasmania (AIHW analysis of MBS data set 2018; DHS 2018; supplementary tables S7.5.7, S7.5.8).

**Figure 7.5.4: Number of telehealth services per 10,000 population, 2011–12 and 2016–17, by state and territory**



Sources: ABS 2017a; DHS 2018; Table S7.5.7.

**Figure 7.5.5: Number of patient-end telehealth support services per 10,000 population, 2011–12 and 2016–17, by state and territory**



Sources: ABS 2017a; DHS 2018; Table S7.5.8.

### What is the AIHW doing?

The AIHW, in partnership with the Australian Bureau of Statistics, conducted the Coordination of Health Care Study. This study fills a national data gap and will inform policy decisions by providing nationally consistent and locally relevant results about patients’ coordination and continuity of care. The study involves linking consenting participants’ survey results to their MBS, PBS, hospital and emergency department records both 1.5 years before and after the survey was conducted. This will help to identify predictors of poor coordination experiences and the outcomes associated with poor coordination of care—for example, to assess the association between higher versus lower coordination of primary health care among people with chronic health conditions and their use of emergency departments or hospitals. See Chapter 7.18 ‘Coordination of health care’ for more information on this study.

### What is missing from the picture?

There are currently limited detailed data on primary health care consultations. From 1998 to 2016, the BEACH surveys of GP activity provided insight into patient demographics, types of problems being managed, and the type of care provided by GPs. However, the 2015–16 BEACH data collection was the last survey to be done.

Although Medicare services data provide some insight into variation in use of primary health care across Australia, they do not include information about why patients visit health professionals, their diagnosis, treatment, test results or referrals for further care.

There are also limited national data for ambulance, aeromedical, allied health, dental or state-funded community health services.

Without these data, it is difficult to assess the appropriateness, cost-effectiveness, safety, quality and accessibility of primary health care. For example, without data on the reason for a consultation, prescription or test, it is difficult to define 'appropriate' use and hence understand the scale and cost of duplicate and unnecessary prescribing, imaging and treatments. It is also difficult to attribute improvements in health outcomes to the primary health care system, as responsibility for health outcomes is across the health care sector and there is often a lag time between intervention and improved health outcome.

Developments are now underway to improve the completeness and use of primary health care data. These include:

- a commitment to develop a national primary care data set. This will help to measure and monitor primary health care performance at a local, regional and national level to enable research, inform policy, and identify regionally specific issues and best-case practices to better understand health and health care in the community
- ongoing reviews and consolidation of national reporting frameworks (see Chapter 1.4 'Indicators of Australia's health')
- implementation of Australia's National Digital Health Strategy
- developments in data linkage capacity. Data linkage can improve the understanding of patient outcomes and pathways through the health system
- developments in ensuring the anonymity and secure transfer of data.

## Where do I go for more information?

Local level primary health care data are available at <[www.myhealthycommunities.gov.au](http://www.myhealthycommunities.gov.au)>.

Information about Indigenous people's access to primary health services can be found in [Aboriginal and Torres Strait Islander health organisations: online services report—key results 2015–16](#).

## References

- ABS (Australian Bureau of Statistics) 2014. Patient experiences in Australia: summary of findings, 2013–14. ABS cat. no. 4839.0. Canberra: ABS.
- ABS 2015. Patient experiences in Australia: summary of findings, 2014–15. ABS cat. no. 4839.0. Canberra: ABS.
- ABS 2016. Patient experiences in Australia: summary of findings, 2015–16. ABS cat. no. 4839.0. Canberra: ABS.
- ABS 2017a. Australian demographic statistics, June 2017: Table 4. Estimated resident population, states and territories (number). ABS cat. no. 3101.0. Canberra: ABS.
- ABS 2017b. National Health Survey: health service usage and health related actions, Australia, 2014–15. ABS cat. no. 4364.0.55.002. Canberra: ABS.
- ABS 2017c. Patient experiences in Australia: summary of findings, 2016–17. ABS cat. no. 4839.0. Canberra: ABS.
- AIHW (Australian Institute of Health and Welfare) 2017a. Aboriginal and Torres Strait Islander health organisations: online services report—key results 2015–16. Aboriginal and Torres Strait Islander health services report no. 8. Cat. no. IHW 180. Canberra: AIHW. Viewed 21 January 2018, <<https://www.aihw.gov.au/getmedia/3d8f3435-4fe4-4580-ab32-e1608bbb6b9c/20797.pdf.aspx?inline=true>>.
- AIHW 2017b. Health expenditure Australia 2015–16. Health and welfare expenditure series no. 58. Cat. no. HWE 68. Canberra: AIHW.

AIHW 2017c. MyHealthyCommunities web update: Medicare Benefits Schedule—GP and specialist attendances and expenditure in 2015–16. Canberra: AIHW.

AHPA (Allied Health Professions Australia) 2017. What is allied health? Melbourne: AHPA. Viewed 20 February 2018, <<https://ahpa.com.au/what-is-allied-health/>>.

Australian Digital Health Agency 2017. Australian Digital Health Agency annual report, 2016–17. Sydney: Australian Digital Health Agency.

Australian Prudential Regulation Authority 2017. Benefit trends—June 2017: ancillary benefits [Microsoft Excel spreadsheet]. Private health insurance statistical trends. Viewed 17 November 2017, <<http://www.apra.gov.au/PHI/Publications/Pages/Statistical-Trends.aspx>>.

Britt H, Miller GC, Bayram C, Henderson J, Valenti L, Harrison C et al. 2016. A decade of Australian general practice activity 2006–07 to 2015–16. General practice series no. 41. Sydney: Sydney University Press. Viewed 21 January 2018, <<https://ses.library.usyd.edu.au/handle/2123/15514>>.

Britt H, Miller GC, Henderson J, Bayram C, Harrison C, Valenti L et al. 2016. General practice activity in Australia 2015–16. General practice series no. 40. Sydney: Sydney University Press. Viewed 21 January 2018, <<https://ses.library.usyd.edu.au/handle/2123/15514>>.

Celler B, Varnfield M, Sparks R, Li J, Nepal S, Jang-Jaccard J et al. 2016. Home monitoring of chronic disease for aged care. Canberra: Australian e-Health Research Centre, CSIRO. Viewed 21 January 2018, <<https://www.csiro.au/en/Research/BF/Areas/Digital-health/Improving-access/Home-monitoring>>.

Department of Health 2013. National Primary Health Care Strategic Framework. Viewed 21 January 2018, <[http://www.health.gov.au/internet/main/publishing.nsf/Content/6084A04118674329CA257BF0001A349E/\\$File/NPHCframe.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/6084A04118674329CA257BF0001A349E/$File/NPHCframe.pdf)>.

Department of Health 2017a. Annual Medicare statistics—financial year 1984–85 to 2016–17 [Excel spreadsheet]. Annual Medicare statistics. Viewed 9 November 2017, <<http://www.health.gov.au/internet/main/publishing.nsf/content/annual-medicare-statistics>>.

Department of Health 2017b. Budget to deliver telehealth boost for rural psychological services. Viewed 21 January 2018, <<http://www.health.gov.au/internet/ministers/publishing.nsf/Content/health-mediare-lr2017-hunt035.htm>>.

Department of Health 2018. Medicare Benefits Schedule book, effective 01 January 2018. Canberra: Department of Health.

DHS (Department of Human Services) 2016. Overview of the Department of Veterans' Affairs claiming channels—financial year 2015–16 [Excel spreadsheet]. Overview of the Department of Veterans' Affairs claiming channels. Viewed 24 January 2018, <<https://data.gov.au/dataset/58ebeb4e-6235-407d-9756-4a7d89ec4500>>.

DHS 2018. Medicare Australia statistics. Canberra: DHS. Viewed 30 January 2018, <[http://medicarestatistics.humanservices.gov.au/statistics/mbs\\_item.jsp](http://medicarestatistics.humanservices.gov.au/statistics/mbs_item.jsp)>.

Healthdirect Australia 2017. Annual report: business highlights 2016–17. Sydney: Healthdirect Australia.

Nous Group 2015. Strategic review of telehealth in NSW: final report. Viewed 21 January 2018, <<http://www.health.nsw.gov.au/telehealth/Documents/strategic-review-of-telehealth-in-NSW.PDF>>.

NSW Ministry of Health 2016. NSW Health Telehealth Framework and Implementation Strategy: 2016–2021. Viewed 21 January 2018, <<http://www.health.nsw.gov.au/telehealth/Publications/NSW-telehealth-framework.pdf>>.

OECD (Organisation for Economic Co-operation and Development) 2017. Health at a glance 2017: OECD indicators. Paris: OECD.

RACGP (The Royal Australian College of General Practitioners) 2015. Smoking, nutrition, alcohol, physical activity (SNAP): a population health guide to behavioural risk factors in general practice. 2nd edn. Melbourne: RACGP.

## 7.6 Medicines in the health system

Medicines contribute to Australians' quality of life and improvements in life expectancy by curing or delaying the onset of diseases, relieving symptoms and preventing health complications. Some medicines are only available via prescription from a health professional, while others can be bought over-the-counter at places such as pharmacies and supermarkets.

Providing consumers with access to affordable medicines is a key part of the Australian health care system. The Australian Government helps people to pay for many medicines dispensed in nearly 300 million prescriptions each year under two subsidy schemes (Box 7.6.1)—at a cost of more than \$12 billion in 2016–17.

This article describes some of the recent trends in the volume and cost of medicines dispensed under the Pharmaceutical Benefits Scheme (PBS) and the Repatriation Pharmaceutical Benefits Scheme (RPBS), as well as those not covered by these schemes. The focus of this article is on the PBS, rather than the RPBS, as the PBS accounts for the majority of all prescriptions and payments.

### Box 7.6.1: What are the PBS and the RPBS and how do they work?

The PBS and the RPBS subsidise the cost of many medicines in Australia. The PBS is available for current Medicare card holders and the RPBS for Department of Veterans' Affairs (DVA) Health Card holders.

The Australian Government administers the PBS under the *National Health Act 1953*; the RPBS is administered under the *Veterans' Entitlements Act 1986*. The PBS began in 1948 and has expanded over time. Today, around 5,300 brands of medicines, used to treat a wide range of health conditions, are listed on the Schedule of Pharmaceutical Benefits. The RPBS subsidises pharmaceuticals available under the PBS and additional medicines and items (including wound dressings) for eligible veterans, war widows and widowers, and their dependants.

Under the PBS and the RPBS, the Australian Government sets a maximum 'co-payment' amount that people pay towards the cost of their medicines. Table 7.6.1 shows this amount, and the eligibility requirements to access the schemes.

The Australian Government pays pharmacies the difference between a consumer's co-payment and the PBS price of a medicine, as listed on the Schedule of Pharmaceutical Benefits. Some medicines are priced below the co-payment amount, so the consumer pays the total cost and the government does not contribute.

Patients fall into two broad categories: general and concessional. By far the majority of subsidised PBS prescriptions (around 90%) are dispensed for concessional patients, whose co-payment is substantially less than that to general patients. Concessional patients whose accumulated PBS co-payments reach the 'safety net' threshold amount during a calendar year (\$384 for 2018) pay no further co-payments for PBS/RPBS medicines for the rest of the year.

(continued)



### Box 7.6.1 (continued): What are the PBS and the RPBS and how do they work?

Table 7.6.1 Eligibility and co-payment amounts for the PBS and RPBS

Patient category	Eligibility to access	Maximum co-payment <sup>(a)</sup>
General	Medicare card (for PBS) or	\$39.50 (non-safety net)
	DVA Health Card (for RPBS)	\$6.40 (safety net)
Concessional	Medicare card and one of the following:	
	• Pensioner Concession Card	
	• Seniors Health Card	\$6.40 (non-safety net)
	• Health Care Card	\$0.00 (safety net)
	• DVA Health Card	
	• Safety Net Card	

(a) As at 1 January 2018.

Source: Department of Health 2018.

#### Generally available medicines and those available under special arrangements

All subsidised medicines are listed on the Schedule of Pharmaceutical Benefits under Section 85 (s85) of the *National Health Act 1953*. Most of these medicines (referred to as s85 medicines) are listed on the General Schedule and are generally available to consumers. They are dispensed mainly through community pharmacies, although some are available through eligible hospitals to day patients and patients on discharge.

Other subsidised medicines (referred to as s100 medicines) are available under 'special arrangements', described in Section 100 (s100) of the Act. The special arrangements for many of these medicines mean that they are prescribed under specific conditions, supplied through hospitals, require specialised medical supervision, and are high in cost.

An example is the Highly Specialised Drugs (HSD) Program, which accounted for more than 60% of the cost to the Australian Government of all s100 medicines in 2016–17. This program allows for certain medicines to be prescribed and dispensed in hospitals and now (via the 'HSD community access' arrangements) through general practitioners (GPs) and community pharmacies. HSD includes treatments for hepatitis and human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS).

Other programs operating under the special arrangements of s100 of the Act include the supply of medicines for opiate addiction treatment, chemotherapy and in-vitro fertilisation (IVF) programs. They also include arrangements to supply medicines to people living in isolated areas—such as to Aboriginal and Torres Strait Islander patients in remote areas of Australia via Aboriginal Health Services.

The PBS and RPBS do not cover:

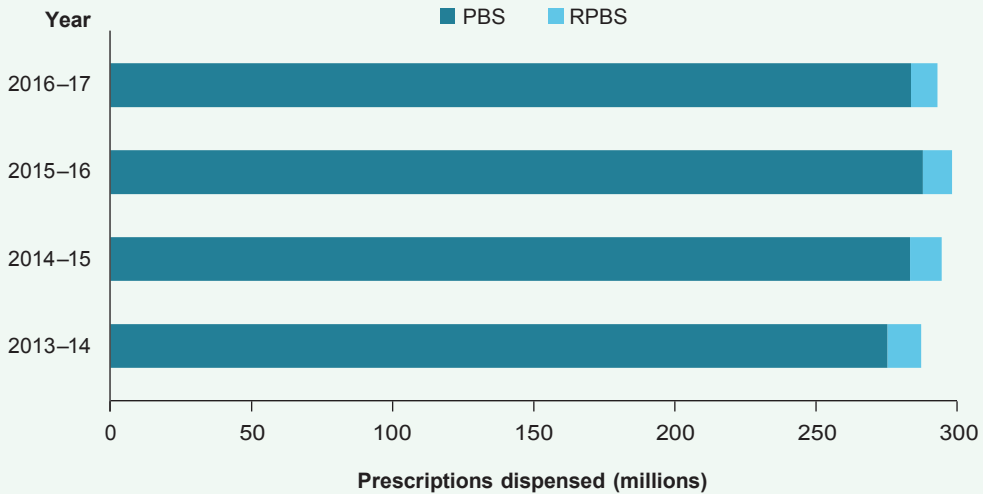
- medicines dispensed via private prescriptions
- over-the-counter medicines
- medicines supplied to public hospital in-patients.

Another Australian Government program for medicines, separate from the PBS, is the Life Saving Drugs Program. It currently provides subsidised access to 13 expensive life-saving medicines for 9 rare and life-threatening conditions. These medicines are not considered cost-effective enough to be listed on the PBS but are funded and made available to eligible patients with recognised rare diseases.

## The number of prescriptions fell in 2016–17 while spending grew

In 2016–17, more than 280 million prescriptions were dispensed under the PBS (Figure 7.6.1), down nearly 2% from the previous year. A further 9.3 million prescriptions were dispensed under the RPBS, also a drop (10%) from 2015–16 (Department of Health 2017).

**Figure 7.6.1: Number of PBS and RPBS prescriptions dispensed, 2013–14 to 2016–17**



*Note:* Includes prescriptions priced above and below the co-payment; s85 and s100 medicines; by date of supply.

*Source:* AIHW analysis of Department of Health PBS and RPBS data 2018; Table S7.6.1.

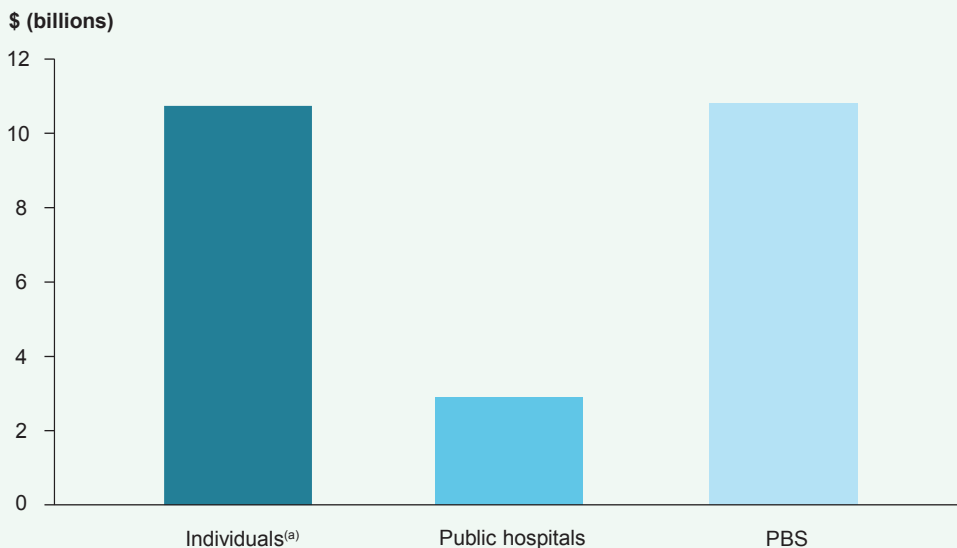
In 2016–17, the Australian Government spent \$12.1 billion on all PBS medicines (including s100 medicines)—an increase of 11% from \$10.8 billion the previous year. This amounts to about 0.7% of gross domestic product (GDP), contributing slightly more as a proportion of GDP than the previous year.

Consumers paid \$1.3 billion in patient contributions on generally available (s85) prescriptions priced above the co-payment in 2016–17—about 13% of the total expenditure on PBS medicines—with the Australian Government contributing the remaining 87% (Department of Health 2017).

Individual consumers spend on medicines both within and outside the PBS. Medicines that do not require a prescription can be bought over-the-counter in a pharmacy or in other retail outlets (for example, supermarkets). Individuals spent a total of \$10.8 billion on medicines (including prescriptions priced above and below the co-payment, over-the-counter medicines and private prescriptions) in 2015–16 (AIHW 2017a).

Aside from government and individual consumers, hospitals are a major source of spending on medicines. Public hospitals reported spending around \$2.9 billion on medicine supplies not covered by the PBS/RPBS in 2015–16 (AIHW 2017b; Figure 7.6.2).

**Figure 7.6.2: Spending on medicines by funding source, 2015–16**



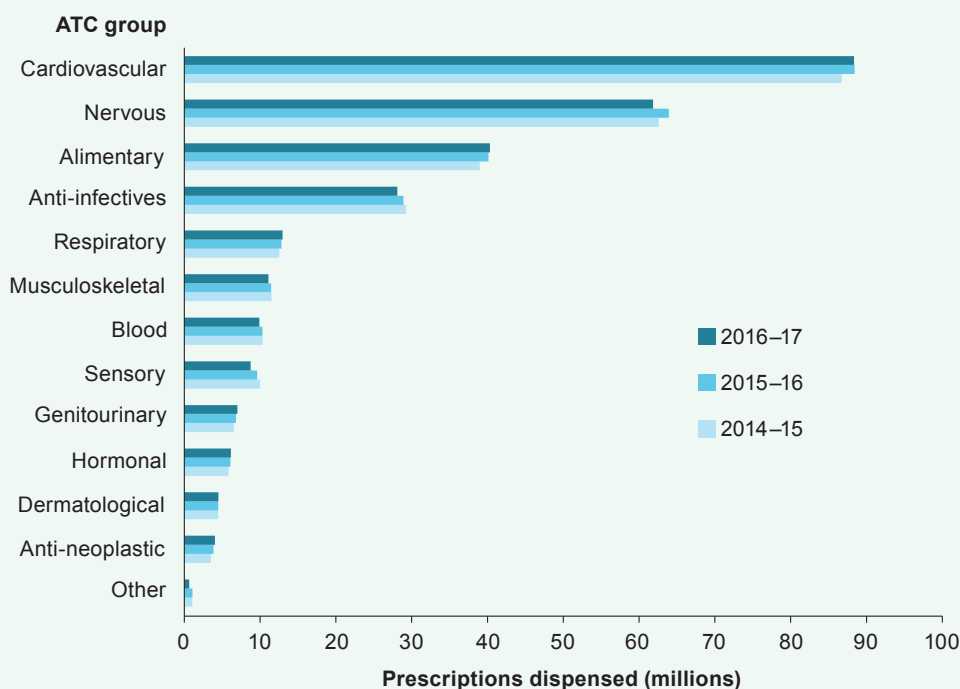
(a) Spending by individuals includes on prescriptions priced above and below the co-payment, over-the-counter medicines and private prescriptions.

Sources: AIHW 2017a, 2017b; Department of Health 2016; Table S7.6.2a.

## Cardiovascular medicines are the most often dispensed

Medicines used to treat cardiovascular conditions were dispensed in larger volumes than medicines for other conditions over the 3 years to 2016–17 (Figure 7.6.3). These include cholesterol-lowering medicines (such as statins)—as raised cholesterol is a major risk factor for developing cardiovascular disease.

**Figure 7.6.3: Number of PBS prescriptions dispensed by Anatomical Therapeutic Chemical<sup>(a)</sup> (ATC) group, 2014–15 to 2016–17**



(a) ATC is a classification of medicines according to the body system/organ on which they act. This figure shows the most basic ATC level (level 1).

*Note:* Includes prescriptions priced above and below the co-payment; s85 and s100 medicines; by date of supply; excludes RPBS.

*Sources:* AIHW analysis of Department of Health PBS data 2018; Table S7.6.3.

Although the volume of medicines dispensed for cardiovascular disease remains higher than for other groups of medicines, the number of statins dispensed has been relatively stable over recent years. As an example, atorvastatin—the medicine most often dispensed—was dispensed in a similar volume from 2014–15 to 2016–17—at around 10 million prescriptions each year (Figure 7.6.4).

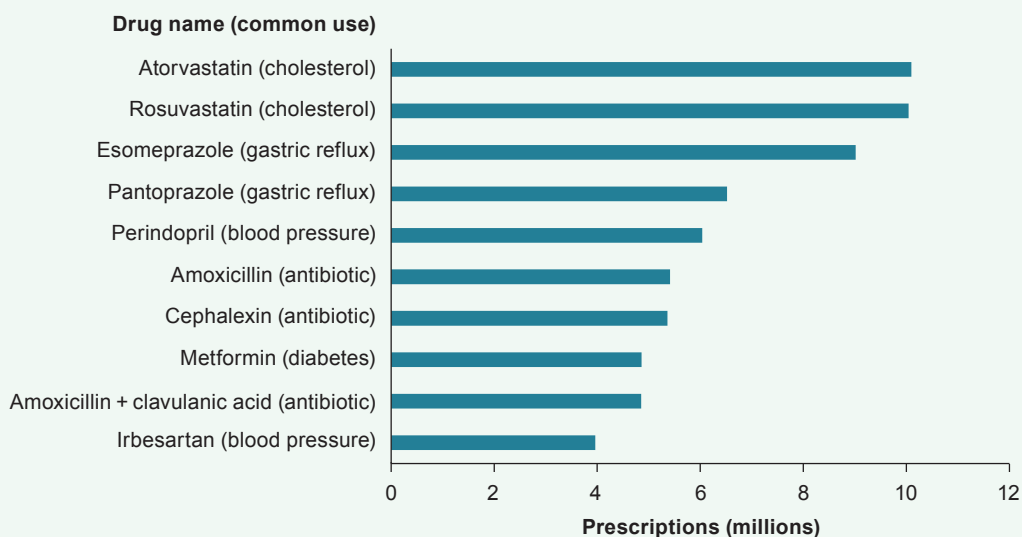
## Other commonly dispensed medicines

Medicines to treat nervous system conditions were the second largest group dispensed. Although the number of prescriptions dispensed for these medicines has historically been on the rise, it fell in 2016–17 (Figure 7.6.3).

Medicines for the digestive tract (alimentary system) were the third most dispensed group and showed a slight growth in prescriptions from 2014–15 to 2016–17. For example, medicines to treat conditions caused by too much acid in the stomach showed marginal increases in the volume dispensed in 2016–17, with esomeprazole reaching 9 million prescriptions and pantoprazole 6.5 million prescriptions (Figure 7.6.4).

Three types of antibiotics were among the 10 most commonly dispensed medicines (Figure 7.6.4). The prescribing of antibiotics is explored further in Box 7.6.2.

**Figure 7.6.4: Ten most common medicines, by number of PBS prescriptions dispensed, 2016–17**



*Note:* s85 medicines only; includes prescriptions priced above and below the co-payment; by date of supply; excludes RPBS.

*Source:* Department of Health 2017; Table S7.6.4.

### **Box 7.6.2: Prescribing of antibiotics**

Antibiotics destroy or slow the growth of bacteria. They are used to treat a variety of infection sites, such as skin, respiratory tract and urinary tract infections, as well as infected wounds.

Australia has relatively high rates of antibiotic prescribing compared with other countries and with the Organisation for Economic Co-operation and Development (OECD) average. Medicine usage can be measured as Defined Daily Doses (DDDs). These are the doses for a particular medicine that are assumed to be the average per day for an adult. The overall volume of antibiotics dispensed in Australia was 23.4 DDDs per 1,000 people per day in 2015, higher than the OECD average of 20.6 DDDs (OECD 2017).

In 2016–17, more than 60% of patients who used the PBS were dispensed at least one antibiotic. The most commonly dispensed antibiotics were amoxicillin, cephalexin, and amoxicillin with clavulanic acid.

There is concern that, in some cases, antibiotics may have been prescribed inappropriately to treat a condition—for example, a viral infection or a toothache. However, prescribers of PBS medicines are currently not required to include on a script the reason they prescribed a medicine, limiting the ability to assess if antibiotics are being prescribed unnecessarily in Australia.

Unnecessary prescribing of antibiotics leads to a higher risk of adverse side effects and, importantly, increased anti-microbial resistance in the population. Anti-microbial resistance poses a major health issue because the bacteria adapt so that antibiotics no longer work on them, leading to the emergence of so-called 'superbugs' (WHO 2017).

## GPs prescribe the most medicines

Up until 2008, only medical practitioners (GPs and specialists) and participating dental practitioners could prescribe PBS medicines. Authorised optometrists have been able to write certain PBS prescriptions since January 2008 and authorised nurse practitioners and midwives since September 2010.

GPs still prescribe the most PBS medicines—around 90% of all medicines dispensed. Hence, the most commonly dispensed medicines from prescriptions issued by GPs in 2016–17 broadly reflect overall prescribing patterns, as shown in Figure 7.6.4.

## Medicines commonly prescribed by other occupation groups

The most commonly dispensed medicines for 2016–17, by authorised occupation group, are outlined in Table 7.6.2. Note that some medicines listed on the PBS may be used to treat a variety of conditions (indications) and this article refers to just some of the common conditions treatable by these medicines.

**Table 7.6.2: Most common medicines, by number of prescriptions dispensed, by selected occupational groups, 2016–17**

Occupation group	Most common medicine(s)	Used to treat...
Medical specialists (other than GPs)	Latanoprost; methylphenidate	High pressure inside the eye, due to glaucoma or other eye diseases; Attention Deficit Hyperactivity Disorder and narcolepsy
Dentists	Amoxicillin	Bacterial infections
Optometrists	Fluorometholone; latanoprost	Eye conditions due to inflammation or injury; high pressure inside the eye
Nurse practitioners	Atorvastatin; esomeprazole	High cholesterol; gastric reflux
Midwives	Cephalexin	Bacterial infections

*Note:* Includes prescriptions priced above and below the co-payment; s85 and s100 medicines included; by date of supply; excludes RPBS.

*Source:* AIHW analysis of Department of Health PBS data 2018; Table S7.6.2b.

## People aged 65 and over take the most medicines

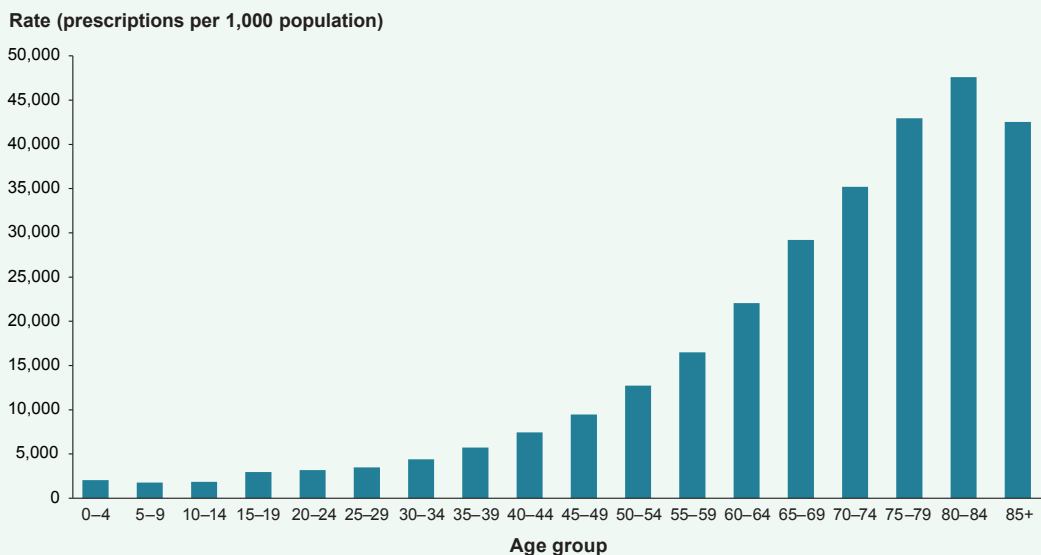
The majority of PBS prescriptions are dispensed to people aged 65 and over (Figure 7.6.5). In 2016–17, people aged 80–84 had the highest rate of script dispensing per 1,000 people, followed by people aged 75–79. This is broadly consistent with people in these age groups also using a relatively higher proportion of hospital and other health services (AIHW 2016:349–65).

For people aged 50 and over, the most commonly dispensed medicines were:

- atorvastatin and rosuvastatin—mainly used to treat high cholesterol and lower the risk of stroke, heart attack or other heart complications
- esomeprazole and pantoprazole—mainly used to reduce the amount of acid produced in the stomach and prevent peptic ulcers.

As people aged 50 and over received 75% of all PBS medicines dispensed, these commonly dispensed medicines are consistent with those most dispensed overall (Figure 7.6.3).

**Figure 7.6.5: Rate of PBS prescriptions dispensed, by age group, 2016–17**



*Notes*

1. Includes prescriptions priced above and below the co-payment; s85 and s100 medicines; by date of supply; excludes RPBS.
2. The population figures are taken from the Australian Bureau of Statistics Estimated Resident Population (the official estimate of the Australian population) as at 31 December 2016.

Source: AIHW analysis of Department of Health PBS data 2018; Table S7.6.5.

## A few specialised medicines account for a disproportionate share of government spending

In 2016–17, around 1% of all PBS prescriptions were for medicines made available under the special arrangements of s100. Yet the total cost of s100 medicines accounted for 26% of spending on all PBS medicines, up from 19% in 2011–12 (Figure 7.6.6).

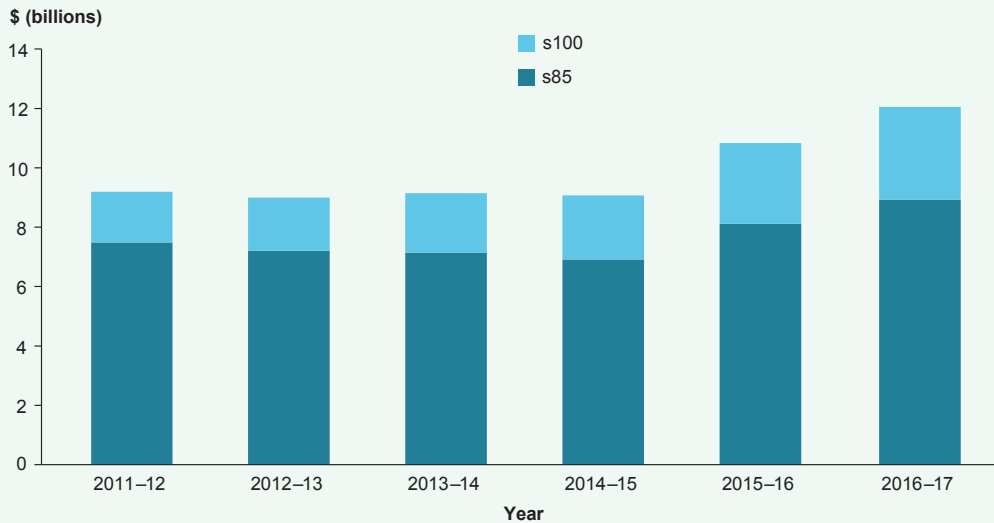
While government spending on all other medicines has remained relatively stable, spending on s100 medicines has been increasing—it grew by around 15% in the year from 2015–16 to 2016–17 (Department of Health 2017).

The main increases in spending for s100 medicines are due to the steady rise in HSD and chemotherapy medicines. The often high cost of these medicines means that even a moderate growth in the number of prescriptions dispensed can substantially affect spending. For example, from 2015–16 to 2016–17, the number of prescriptions dispensed for:

- pertuzumab (for breast cancer) increased by 45%, which led to a rise in government spending of about \$10 million
- pembrolizumab (for melanoma) increased by 65%, which led to a rise in government spending of more than \$50 million.

The rise in spending on s100 medicines may partly be explained by more comprehensive recording of PBS data for s100 prescriptions. Other factors contributing to the increase include the growing incidence of diseases such as cancer and Alzheimer disease, improved disease diagnosis and treatment methods, and the expensive new medicines produced by pharmaceutical companies' research and development programs.

**Figure 7.6.6: Government expenditure on PBS generally available (s85) medicines and medicines available under special arrangements (s100), 2011–12 to 2016–17**



*Note:* Includes s85 and s100 medicines; by date of supply; excludes RPBS.

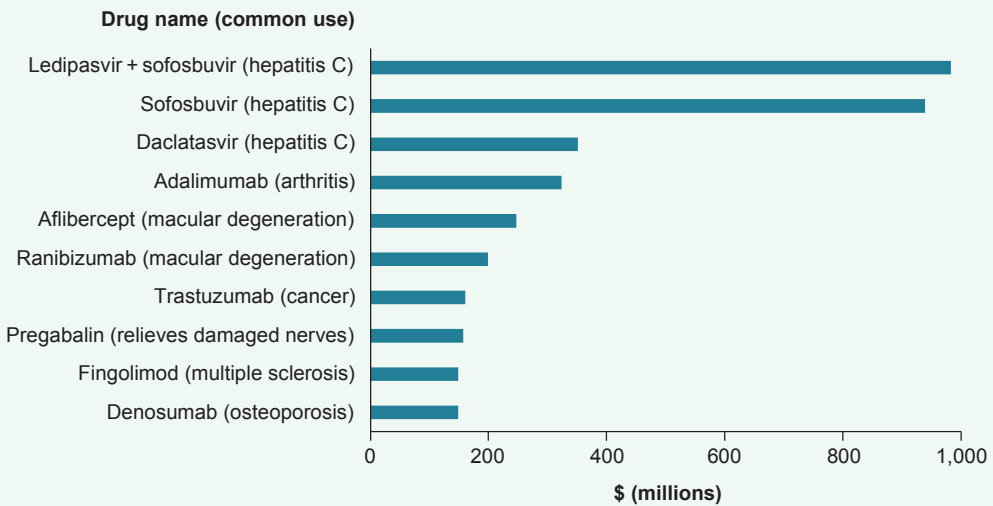
*Source:* AIHW analysis of Department of Health PBS data 2018; Table S7.6.6.

## New hepatitis C medicines accounted for the most government spending

In 2016–17, some relatively new hepatitis C antiviral medicines, medicines for arthritis, and medicines to treat macular degeneration (a leading cause of blindness) accounted for the most spending on medicines by the Australian Government (Figure 7.6.7).



**Figure 7.6.7: Ten medicines accounting for the most Australian government spending on medicines, 2016–17**



*Note:* Includes s85 and s100 medicines; by date of supply; excludes RPBS.

*Source:* AIHW analysis of Department of Health PBS data 2018; Table S7.6.7.

Approximately 230,000 Australians are infected with the hepatitis C virus, which causes liver inflammation; however, before 2016, less than 2% of people with hepatitis C were treated and cured annually. In March 2016, the Australian Government listed several new direct-acting antiviral medicines for hepatitis C on the PBS. Compared with the medicines previously available for people with hepatitis C, these are easier to take, have fewer side effects and are more effective, with the capacity to eventually cure people of the disease. Newer medicines—especially those still under a patent—are usually more expensive than older ones (see Box 7.6.3). The listings for hepatitis C (ledipasvir + sofosbuvir; sofosbuvir; daclatasvir) on the general schedule in March 2016 are some of the costliest medicines on the PBS. Expenditure on these medicines contributed substantially to an increase in PBS expenditure from March 2016 onwards. The total increase in government expenditure in 2016–17 for PBS medicines (excluding s100) was 8.5% compared with the previous year (Department of Health 2017).

## Other medicines accounting for substantial government spending

Other medicines that accounted for relatively greater amounts of government spending in 2016–17 were those used to treat:

- rheumatoid arthritis—with \$324 million spent on adalimumab and \$148 million on etanercept
- macular degeneration—with \$247 million spent on aflibercept and \$200 million on ranibizumab
- cancer—with \$161 million spent on trastuzumab and \$131 million on pembrolizumab (Supplementary Table S7.6.7).

**Box 7.6.3: How does the Australian Government manage the cost of our medicines?**

The Australian Government has several policies to control the cost of medicines listed on the PBS. An important one is the Price Disclosure Policy, which requires pharmaceutical companies to provide data to the government on the sale prices for their medicine brands in the market. The government uses this information to decide how much it pays for PBS-listed medicines.

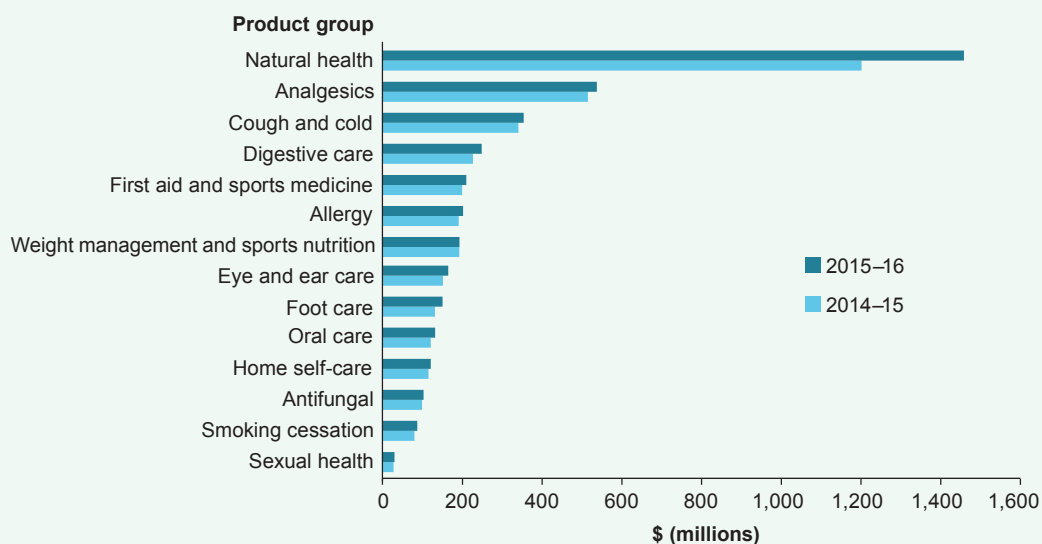
Another policy initiative has been the government's encouragement for listing generic versions of medicines. At the end of a medicine's patent period, other companies can offer generic brands ('bioequivalent'; with active ingredients identical to the original) or biosimilar brands (with very similar but not identical active ingredients) at a cheaper price. Statutory requirements reduce the price of the original medicine by 16% when the first bioequivalent or biosimilar medicine (with the same manner of administration as the original) is listed on the PBS.

## Natural health products are the most popular over-the-counter medicines

Among over-the-counter products sold in pharmacies that did not require a prescription, natural health products were the largest selling items in 2015–16 (\$1.4 billion). These include naturally occurring substances that can be used to maintain or restore health, such as vitamins and minerals, herbal medicines, homeopathic preparations and probiotics. Analgesics were the second largest selling group (\$537 million).

Compared with the previous year, growth in sales in 2015–16 was also greatest for natural health products, at about 21%. Digestive care and smoking cessation products both recorded a growth in sales of more than 9% from 2014–15 to 2015–16 (Figure 7.6.8).

**Figure 7.6.8: Spending on over-the-counter products, by product group, 2014–15 to 2015–16**



Source: IRI customised report, 2015–16; Table S7.6.8.

## What is missing from the picture?

Except for the PBS Schedule of Pharmaceutical Benefits—which lists restrictions and authority requirements (which outline the medical conditions) for some medicines—there is little information recorded on PBS prescriptions about the disease or condition for which a medicine is prescribed. This information would greatly help in assessing how many prescriptions are prescribed, and how much money is spent on each disease group. It may also shed some light on whether some medicines are being over-prescribed for certain conditions.

In previous years, results of the Bettering the Evaluation and Care of Health (BEACH) surveys provided some insights into the prescribing patterns of GPs. (The survey was discontinued after 2015–16.) Better understanding prescribing patterns may be helped by future improvements in primary care data (see Chapter 7.5 'Primary health care').

Furthermore, there is at present an incomplete picture of medicines dispensed in hospitals. This is because medicines for admitted patients in public hospitals are not subsidised under the PBS and are therefore not included in the PBS data. PBS medicines are available for non-admitted patients and patients on discharge from hospitals, but only for states and territories that are part of the Public Hospital Pharmaceutical Reforms. Nationally collated data on medicines dispensed to hospital admitted patients would provide a clearer picture of the overall use of medicines in Australia.

## Where do I go for more information?

For more information on medicine statistics in Australia, visit the [Medicare Statistics](#) website or the [PBS Statistics](#) webpage.

## References

AIHW (Australian Institute of Health and Welfare) 2016. Australia's health 2016. Australia's health series no. 15. Cat. no. AUS 199. Canberra: AIHW.

AIHW 2017a. Health expenditure Australia 2015–16. Health and welfare expenditure series no. 58. Cat. no. HWE 68. Canberra: AIHW.

AIHW 2017b. Hospital resources 2015–2016: Australian hospital statistics. Health services no. 78. Cat. no. HSE 190. Canberra: AIHW.

Department of Health 2016. Expenditure and prescriptions twelve months to 30 June 2016. Canberra: Department of Health. Viewed 26 April 2018, <<http://www.pbs.gov.au/info/statistics/pbs-expenditure-prescriptions-30-june-2016>>.

Department of Health 2017. Expenditure and prescriptions twelve months to 30 June 2017. Canberra: Department of Health. Viewed 22 January 2018, <<https://www.pbs.gov.au/info/statistics/expenditure-prescriptions-twelve-months-to-30-june-2017>>.

Department of Health 2018. Pharmaceutical benefits: fees, patient contributions and safety net thresholds. Canberra: Department of Health. Viewed 24 January 2018, <<http://www.pbs.gov.au/info/healthpro/explanatory-notes/front/fee>>.

OECD (Organisation for Economic Co-operation and Development) 2017. Health at a glance 2017: OECD indicators. Paris: OECD Publishing. Viewed 30 January 2018, <<https://www.oecd.org/australia/Health-at-a-Glance-2017-Key-Findings-AUSTRALIA.pdf>>.

WHO (World Health Organization) 2017. Antibiotic resistance: fact sheet. Geneva: WHO. Viewed 22 December 2017, <<http://www.who.int/mediacentre/factsheets/antibiotic-resistance/en/>>.

## 7.7 Overview of hospitals

Hospitals are an important part of Australia's health system, providing services to many Australians each year.

In 2015–16, there were 701 public hospitals in Australia, with 61,000 beds (a rate of 2.56 beds per 1,000 population—similar to the 2.62 per 1,000 in 2011–12). Public hospitals were very diverse in location, size and the services provided. The 30 principal referral hospitals (mostly located in metropolitan areas) had an average of 659 beds each, while 69% of hospitals had fewer than 50 beds.

In the same year (2015–16), there were 630 private hospitals (including day hospital facilities), with 33,100 hospital beds. This was 1.39 beds per 1,000 population—an increase from the 1.30 per 1,000 in 2011–12.

Both hospital sectors provide services for admitted and non-admitted patients (outpatient clinics and emergency department care).

### Admitted patient services

Admitted patient services, or hospitalisations (see Glossary), are provided when a patient is formally admitted to a hospital. Hospitalisations can either be on the same day or involve a stay in hospital of 1 or more nights. The broad types of admitted patient care are medical, surgical (see Chapter 7.11 'Elective surgery') and other acute care, along with childbirth, mental health care and subacute (for example, rehabilitation) and non-acute care. About 3 in every 5 (59%) hospitalisations occurred in public hospitals.

About 6.3 million (59%) hospitalisations occurred in public hospitals and 4.3 million in private hospitals (Table 7.7.1).

### Non-admitted patient services

Non-admitted patient care includes care provided in emergency departments and outpatient clinics. Non-admitted patient care can also include the dispensing of medicines to patients not admitted to the hospital, and district nursing and some community health services provided by hospitals—those activities are not included in the information presented here. For some emergency department services, the patient is later admitted to hospital; that admitted patient activity is not included here.

Public hospitals provide the majority of non-admitted patient services.

**Table 7.7.1: Characteristics of admitted patient services, public and private hospitals, 2015–16**

	<b>Public hospitals</b>	<b>Private hospitals</b>
<b>Hospitalisations</b>	<b>6.3 million (an average increase of 3.3% per year since 2011–12)</b>	<b>4.3 million (an average increase of 3.7% per year since 2011–12)</b>
Acute care—medical	4.3 million	1.3 million
Acute care—surgical	1.0 million	1.5 million
Acute care—other	420,000	895,000
Childbirth	234,000	76,000
Mental health care	133,000	171,000
Subacute care—rehabilitation	103,000	332,000
Subacute and non-acute care—other	97,000	18,000
Overnight versus same-day	47% overnight stays; 53% same-day	29% overnight stays; 71% same-day
Number of days of patient care	20 million (average increase of 1.5% per year since 2011–12)	10 million (average increase of 2.5% per year since 2011–12)
Average length of stay (for overnight stays)	5.7 days (average decrease of 1.3% per year since 2011–12)	5.2 days (average decrease of 0.4% per year since 2011–12)

*Note:* Private hospitals that are contracted by state and territory governments to provide public hospital services are included here under public hospitals. Non-admitted patient data exclude the Australian Capital Territory, as data were not provided for 2015–16. In 2015–16, non-admitted patient care service events reported for 19 other services included local hospital networks and some private hospitals in Western Australia.

*Source:* National Hospital Morbidity Database.

## Outpatient clinics

In outpatient clinics, patients consult specialist medical practitioners, have diagnostic services or other procedures, or are provided with allied health or specialist nursing care—without being admitted to hospital. In 2015–16, about 33.4 million outpatient clinic service events were reported for 604 public hospitals and 19 other services that provided outpatient care for public patients:

- 46% of services were in allied health and/or clinical nurse specialist clinics—*Midwifery and maternity* (2.1 million service events) and *Primary health care* (1.8 million) were the most commonly reported
- 29% were in medical consultation clinics—*Orthopaedics* (1 million service events) and *Medical oncology (consultation)* (632,000) were the most commonly reported
- 16% were in stand-alone diagnostic clinics—*Pathology (microbiology, haematology, biochemistry)* (2.8 million service events) and *General imaging* (1.8 million) were the most commonly reported
- 7.9% were in procedural clinics—*Dental* (920,000 service events) and *Radiation oncology (treatment)* (756,000) were the most commonly reported.

In 2015–16, 92 private hospitals provided about 1.5 million outpatient clinic services (ABS 2017).

## Emergency departments

In 2016–17, there were about 7.8 million presentations to Australia's 287 formal public hospital emergency departments. This was an average of more than 21,000 each day across Australia and represented a 2.0% increase (after adjusting for the number of hospitals included) from 2015–16 (7.5 million) (see Chapter 7.10 'Emergency department care').

In 2015–16, about 538,000 accident and emergency services were provided by 36 private hospitals. These hospitals included those that did not have a formal accident and emergency unit but treated accident and emergency patients (ABS 2017).

### What is missing from the picture?

Although well-developed hospitalisation data are available, there are variations in how hospital services are defined and counted between jurisdictions. Data are based on each hospitalisation or service, rather than on individuals, and current national data cannot easily be used to analyse care patterns for patients hospitalised several times. Similarly, it is difficult to analyse patterns of care across admitted and non-admitted patient settings (including non-hospital settings such as primary health care). Data linkage can improve the understanding of patient outcomes and pathways through the health system.

As well, there are limitations in examining issues related to patients' accessing outpatient clinics and emergency departments because these data do not contain the same level of detail as hospitalisation data, particularly for diagnosis.

Private hospital data are collected, analysed and disseminated through different reporting pathways. As a result, private hospital data may not be consistent across the various collections, or with data for public hospitals.

### Where do I go for more information?

More information on hospitals in Australia and the services they provide is in reports from the Australian hospital statistics series: *Admitted patient care 2015–16*; *Elective surgery waiting times 2016–17*; *Emergency department care 2016–17*; *Non-admitted patient care 2015–16*; *Hospital resources 2015–16*; and *Staphylococcus aureus bacteraemia in Australian public hospitals 2015–16*; and from *Australia's hospitals 2015–16 at a glance* and *Private hospitals, Australia, 2015–16*.

Information about activity and performance for more than 1,000 Australian public and private hospitals is on the [My Hospitals website](#).

## References

Australian Bureau of Statistics (ABS) 2017. Private hospitals, Australia, 2015–16. ABS cat. No. 4390.0. Canberra: ABS.

## 7.8 Funding sources for the care of admitted patients

Australian hospitals collect information about the funding source for admitted patient hospitalisations. The information presented in this snapshot relates to hospitalisations for:

- public patients, who are admitted at no charge (publicly funded)
- patients whose stay was either completely or partially funded by private health insurance
- patients funded by other sources (see Glossary for definitions of public, private health insurance and other patients).

The data are drawn from the AIHW's National Hospital Morbidity Database and relate to the funding source reported against each episode of admitted patient care, or hospitalisation (see Glossary).

In 2015–16, of the 10.6 million hospitalisations for admitted patients in public and private hospitals combined:

- 5.3 million, or 51%, were public patients (an average increase of 3.1% per year since 2006–07)
- 4.5 million, or 42%, were at least partially funded by private health insurance (an average increase of 5.6% per year since 2006–07)
- 777,000, or around 7.3%, were funded by other sources, including self-funded patients, Department of Veterans' Affairs patients and compensation claim patients (an average decrease of 0.2% per year since 2006–07).

### Public hospitals

In 2015–16, around 5.2 million hospitalisations were for public patients (83% of all public hospital admissions) and 872,000 (14%) were at least partially funded by private health insurance (Figure 7.8.1). Since 2006–07, public patient hospitalisations increased by 2.8%, on average, each year and hospitalisations funded by private health insurance increased by 9.6%, on average, each year.

- The majority (85%) of same-day hospitalisations were public patients and 13% were funded through private health insurance.
- Eighty-one per cent (81%) of overnight stay hospitalisations were for public patients while 15% were funded through private health insurance.

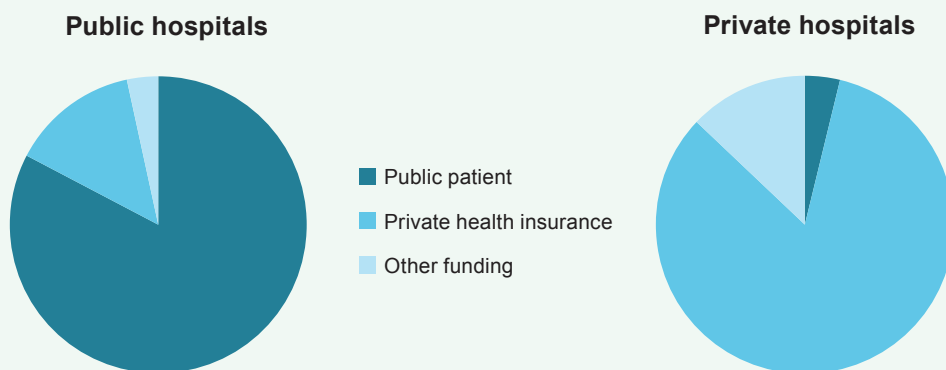


## Private hospitals

In 2015–16, around 3.6 million hospitalisations were funded by private health insurance (83% of all private hospital admissions) and 162,500 (3.8%) were public patients (Figure 7.8.1). Since 2006–07, hospitalisations funded by private health insurance increased by 4.9% on average each year, and public patients by an average of 14% each year.

- Eighty-two per cent (82%) of same-day hospitalisations were funded by private health insurance and 4.7% were public patients.
- The majority (86%) of overnight stay hospitalisations were funded by private health insurance, with less than 1.5% for public patients.

**Figure 7.8.1: Proportion of hospitalisations by funding source, public and private hospitals, 2015–16**



Source: National Hospital Morbidity Database; Table S7.8.1.

## How do public patients and patients funded by private health insurance compare?

In 2015–16:

- patients whose admission to hospital was an emergency were more likely to be publicly funded than funded through private health insurance—74% and 21% of hospitalisations, respectively
- elective admissions were more likely to be funded by private health insurance than publicly funded (56% and 35%, respectively)
- among patients living in *Major cities*, 47% of hospitalisations were public patients and 46% were funded by private health insurance
- among patients living in *Outer regional* areas, 63% of hospitalisations were public patients and 31% were funded by private health insurance—the equivalent figures for patients from *Remote* and *Very remote* areas (combined) were 83% and 14%, respectively



- the majority (62%) of hospitalisations for people living in the highest socioeconomic areas were funded through private health insurance and 31% were for public patients
- among people living in the lowest socioeconomic areas, 66% were hospitalisations for public patients and 27% were funded through private health insurance.

## What is missing from the picture?

Information is not available on the number of hospitalisations for patients who have private health (hospital) insurance but did not use it.

Hospital admissions can be completely or partially funded by private health insurance. The data show only that private health insurance was used as a source for funding hospital admissions; they do not give information about how much funding was provided by private health insurance for each hospitalisation and what proportion of the total cost it represented.

## Where do I go for more information?

More information on the funding of public and private hospital services is available in [\*Private health insurance use in Australian hospitals 2006–07 to 2015–16\*](#).

Further information about private health insurance in Australia, including information on hospitalisations funded by private health insurance, can be sourced from the [Australian Prudential Regulation Authority website](#).



## 7.9 Safety and quality of hospital care

The safety and quality of the care provided in Australia's hospitals are of utmost importance to all patients, their families and carers. It is a key focus for Australian governments, service providers and health professionals.

This article summarises how the safety and quality of hospital care are measured and reported in Australia and presents data on selected measures. The future of safety and quality measurement in hospitals is also discussed, particularly in the context of patient centred care—where the patient is empowered and encouraged to be an active participant in their care.

### What is meant by safety and quality?

Informally, the term 'safety and quality' is often summarised as: the right care, in the right place, at the right time and cost. Formal definitions vary slightly, depending on the source. The Australian Commission on Safety and Quality in Health Care (the Commission) defines safety as 'reducing the risk of unnecessary harm associated with health care to an acceptable minimum' (ACSQHC 2017a). The Australian Health Performance Framework (AHPF) defines safety as 'the avoidance or reduction to acceptable limits of actual or potential harm from health care management or the environment in which health care is delivered' (NHPPC 2017).

The Commission defines quality as 'the degree to which health services for individuals and populations increase the likelihood of desired health outcomes, and are consistent with current professional knowledge' (ACSQHC 2015). In the AHPF there is no specific 'quality' domain, as quality relates to all health system information domains, including 'Effectiveness', 'Continuity of care', 'Accessibility' and 'Appropriateness' (see Chapter 1.4 'Indicators of Australia's health').

A safe and high-quality health system provides the most appropriate and best-value care, while keeping patients safe from preventable harm. The benefits to the patient are paramount.

The AHPF, and a number of national agreements, support monitoring of the safety and quality of patient care in hospitals.

### Improving safety and quality

A range of organisations act to improve safety and quality of health care. They may focus their efforts nationally, at the state or territory level (for example, health departments), at the service level (for example, individual hospitals), at the clinical level or for specific areas of health care (health professional associations). At a national level, the Commission is the key agency, providing national leadership to improve the safety and quality of health care in Australia (Box 7.9.1).

### **Box 7.9.1: Australian Commission on Safety and Quality in Health Care**

The Commission's role is to lead and coordinate national improvements in safety and quality in health care. To achieve a safe, high-quality and sustainable health system, it works in partnership with patients; carers; clinicians; the Australian, state and territory health systems; the private sector; managers; and health care organisations.

The Commission aims to:

- ensure the health system enables patients, consumers and members of the community to participate as partners with their health professionals in all aspects of health care
- ensure patients and consumers are kept safe from preventable harm
- have a health system that provides the right care, minimises waste and optimises value and productivity
- have a health system that supports safe clinical practice by implementing robust and sustainable improvement systems (ACSQHC 2017a).

Areas of work for the Commission include:

- developing and implementing the National Safety and Quality Health Service Standards that provide consistent standards about the level of care consumers can expect from health services
- developing and maintaining indicators aimed at promoting local safety and quality improvement
- supporting the health system to reduce unwarranted clinical variation. This work included publishing the first and second atlases of health care variation, which showed substantial variation in treatment across Australia (see Chapter 7.16 'Variation in health care provision' for more information)
- updating the Framework for Australian Clinical Quality Registries (ACSQHC 2014) which provides guidance on how to establish and develop clinical quality registries to enable benchmarked feedback to be provided to individual clinicians on their clinical performance
- working in partnership with patients, consumers, health care providers, policy makers and members of the community towards having person centred health care organisations. This includes work to improve health literacy (see Chapter 4.3 'Health literacy' for more information)
- supporting the consistent and routine use of patient-reported outcome measures and patient-reported experience measures to drive quality improvement in a way that brings patients' voices and outcomes to the fore (see Chapter 7.17 'Patient-reported experience and outcome measures' for more information).

Pricing mechanisms are part of national efforts in improving safety and quality of hospitals. Box 7.9.2 outlines recent initiatives to integrate safety and quality into the pricing and funding of public hospitals.

**Box 7.9.2: Pricing for safety and quality**

In 2017, the Australian Government and states and territories agreed to integrate safety and quality into the pricing and funding of public hospitals (CFFR 2017). The aim is to improve patient health outcomes and safety, and support greater efficiency of the health system.

When all reforms are in place, it is intended that funding and pricing for public hospitals will be linked to sentinel events (events that result in death or serious harm to a patient), hospital-acquired complications, and avoidable readmissions to hospital. Patient-centred care is one of the key principles underlying these reforms.

To varying extents, safety and quality are integrated into the pricing and funding of privately funded hospital care; the nature of such arrangements will vary depending on individual agreements between health insurers and hospitals.

Efforts to improve the safety and quality of health care include public reporting of information on these issues, including reporting by the AIHW. Reporting on safety and quality supports accountability and transparency in service provision. When relevant information is reported back to health professionals, health providers and the public, it can improve decision making and patient outcomes.

Alongside these efforts are the activities undertaken by states and territories and health service providers to measure and monitor performance within their jurisdictions, or by organisations to improve clinical outcomes and the appropriateness of their services.

## Selected indicators of the safety and quality of hospital care

This section presents information on the routinely reported national indicators of safety and quality of care for admitted patients in Australian hospitals.

Information on the indicators discussed in this section—except for *Staphylococcus aureus* bacteraemia (SAB) cases in hospitals, and sentinel events—is derived from the AIHW's National Hospital Morbidity Database (NHMD). It should be noted that the data in the NHMD are collected primarily to record care provided to admitted patients; use of them for purposes such as reporting adverse events is developing, and evidence of validity is incomplete. The results should therefore be treated with caution.

Note, too, that the available information does not give a complete picture. For example, there is no routinely available information on some aspects of quality, such as continuity or responsiveness of hospital services.

## Health care-associated infections: *Staphylococcus aureus* bacteraemia cases in hospitals

SAB is an infection often associated with health care. It occurs when *Staphylococcus aureus* bacteria ('Golden staph') infect the bloodstream (bacteraemia). When associated with health care procedures, these infections are considered to be potentially preventable. Hospitals aim to have as few SAB cases as possible.

In fact, the rate of SAB is a national performance indicator for public hospitals. The performance benchmark is that the rate of SAB (including methicillin resistant *Staphylococcus aureus*, or MRSA) is no more than 2.0 per 10,000 days of patient care for acute care public hospitals in each state and territory.

In 2016–17, for public hospitals:

- the national rate of SAB was 0.8 cases per 10,000 days of patient care
- all jurisdictions had rates below the national benchmark
- almost all hospitals, for which data were published, had rates below the national benchmark (99%)
- most cases of SAB (81%) were treatable with commonly used antibiotics. These cases are termed methicillin-sensitive *Staphylococcus aureus* (MSSA) cases, while 19% of cases were MRSA (antibiotic resistant) cases (AIHW 2017a).

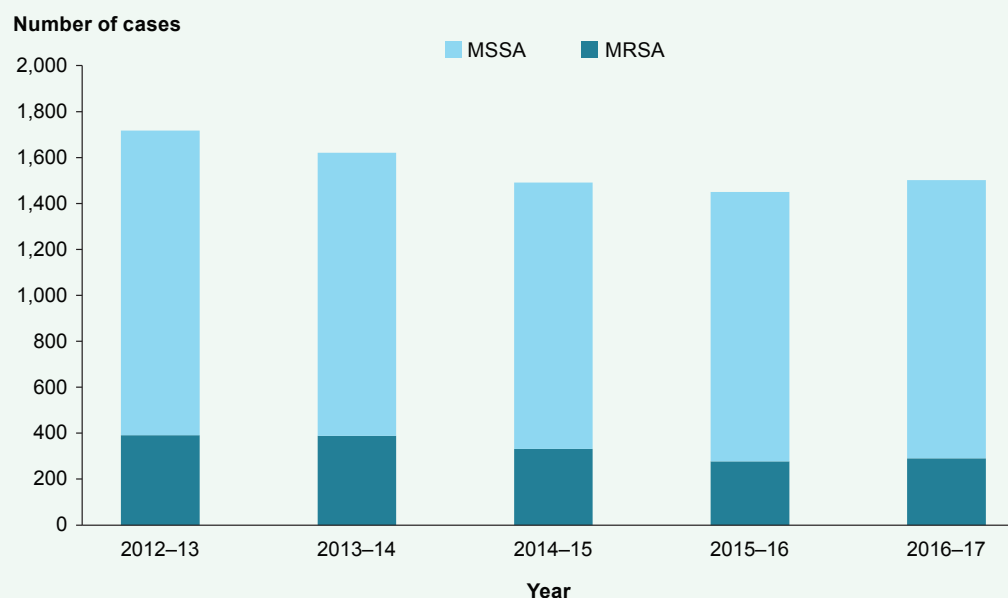
Between 2012–13 and 2015–16, rates of SAB fell from 0.9 cases to 0.7 cases per 10,000 days of patient care, then increased in 2016–17 to 0.8. The number of SAB cases dropped from 1,717 in 2012–13 to 1,450 in 2015–16, then increased to 1,502 cases in 2016–17. The number of MRSA cases decreased from 391 in 2012–13 to 278 cases in 2015–16, then increased to 290 cases in 2016–17 (Figure 7.9.1).

For 2016–17, SAB data for 89 (14% of all) private hospitals were reported. All private hospitals that reported SAB data had rates below the national benchmark. The national rate of SAB in private hospitals that had reported data was 0.4 cases per 10,000 days of patient care (AIHW 2017a). The data for public hospitals may not be comparable with the data for private hospitals because recording practices may differ.

Improvements in the hand hygiene of health care workers is the highest priority for reducing the risk of infections associated with health care. Hand Hygiene Australia reported that, in October 2017, hand hygiene compliance in all hospitals (public and private combined) was about 85% (HHA 2017). Between July 2012 and June 2017, hand hygiene compliance in public hospitals increased from about 76% to 84%. Between July 2013 and June 2017, hand hygiene compliance in private hospitals increased from 76% to 86%.

SAB performance information for individual public hospitals and for some private hospitals is available on the AIHW's MyHospitals website (see section 'Where do I go for more information?').

Figure 7.9.1: Cases of SAB in public hospitals, by antibiotic sensitivity status (MSSA or MRSA), 2012–13 to 2016–17



Source: AIHW 2017a; Table S7.9.1.

## *Clostridium difficile* infections associated with health care

*Clostridium difficile* infection (CDI) is a gastrointestinal infection that commonly affects hospitalised patients and people in the community. The transmission, prevention and control of CDI is complex because it can be exacerbated by treatment with antibiotics; it can also spread between patients because of poor infection control and contaminated hospital surfaces and medical equipment (ACSQHC 2017c).

Each year between 2011–12 and 2015–16, around 1 in 800 (around 8,000) hospitalisations in public hospitals involved patients with CDI. For around 30% of these hospitalisations, the patients were admitted to hospital with a diagnosis of CDI; the rest acquired the infection during their hospital stay (ACSQHC 2017c).

## Adverse events treated in hospitals

'Adverse events treated in hospitals' is a measure of the safety and quality of the care provided to admitted patients. It covers a range of events, rather than focusing on one type, such as readmissions or falls. This indicator is limited to adverse events that can be identified by specific codes for diseases and injuries in the NHMD and therefore may not include all adverse events.

Adverse events are defined as incidents where harm resulted to a person receiving health care. They include the adverse effects of drugs, injuries that occur during care, and conditions that occur after procedures (such as infections and bleeding). Some of these events may be preventable.

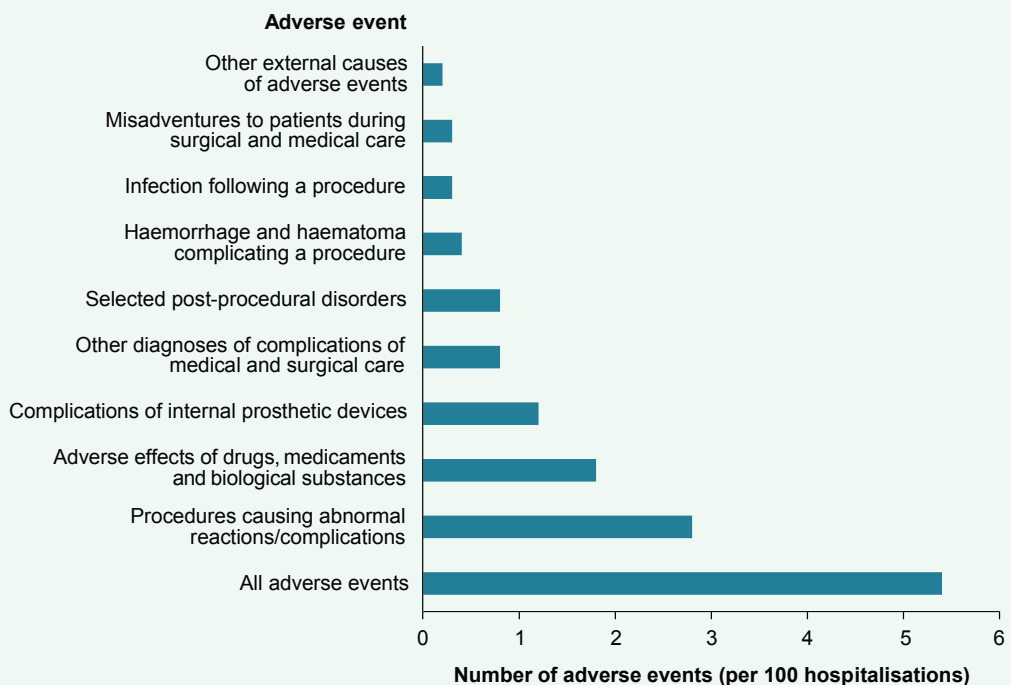
Adverse events can lead to increased length of stay and poorer patient outcomes, along with increased costs of treatment. This indicator is based on an event (or events) identified by the treating doctor in the clinical record as having had an adverse outcome that resulted in, or affected, hospital admission. One hospitalisation may have more than one adverse event.

In 2015–16:

- about 576,000 hospitalisations (5.4 per 100) reported 1 or more adverse events (Figure 7.9.2)
- these hospitalisations accounted for about 6.6 per 100 hospitalisations for public hospitals and 3.8 per 100 for private hospitals. The data for public hospitals are not comparable with those for private hospitals because their casemix differs and recording practices may also be different
- the most common adverse event group reported was *Procedures causing abnormal reactions/complications* (around half of all hospitalisations with 1 or more adverse event); this pattern was consistent for both public and private hospitals (AIHW 2017b).

See Chapter 1.4 'Indicators of Australia's health' for more information.

**Figure 7.9.2: Adverse events per 100 hospitalisations, all hospitals, 2015–16**



*Note:* The adverse events presented are not mutually exclusive, and a hospitalisation may include more than one adverse event.

*Source:* AIHW 2017b; Table S7.9.2.

Another way to assess the overall safety and quality of care provided to admitted patients is to measure diagnoses reported as being acquired during the hospital episode (Box 7.9.3).

### Box 7.9.3: Hospital-acquired diagnoses

Hospital-acquired diagnoses is another measure of the overall safety and quality of care provided to admitted patients. This measure overlaps with the safety and quality performance indicators presented in this article but is not, in itself, a national performance indicator. This measure and the performance indicators should not be added together due to this overlap.

The Classification of Hospital-Acquired Diagnoses is a system that allows hospitals to identify, count and monitor events as markers of patient safety (ACSQHC 2013). The hospital-acquired diagnoses included in the classification are broader than those defined as hospital-acquired complications (described later), and include post-procedural complications, adverse drug events, accidental injuries, specific infections and metabolic disorders. A hospital-acquired diagnosis is identified using a condition onset flag (which indicates whether the condition was apparent before or after hospitalisation), along with diagnosis information.

In 2015–16:

- more than 889,000 hospitalisations reported a hospital-acquired diagnosis. These accounted for about 9.8% of hospitalisations in public hospitals and 6.6% in private hospitals
- for public hospitals, the most common hospital-acquired diagnoses were *Labour, delivery and postpartum complications* and *Cardiovascular complications* (accounting for 20% and 17% of hospitalisations that included a hospital-acquired diagnosis, respectively)
- for private hospitals, the most common hospital-acquired diagnoses were *Gastrointestinal complications*, accounting for 20% of hospitalisations that included a hospital-acquired diagnosis
- *Post-procedural complications* accounted for about 12% of hospital-acquired diagnosis in public hospitals and 15% in private hospitals (AIHW 2017b)
- about 30% of hospital-acquired diagnoses were also classified as 'Adverse events treated in hospital'.

## Falls resulting in patient harm in hospitals

This indicator is intended to report where a fall occurred in hospital during an episode of care, resulting in patient harm. Falls resulting in patient harm in hospitals is a subset of 'Adverse events treated in hospital'.

In 2015–16, about 34,000 hospitalisations (3.2 per 1,000 hospitalisations) reported a fall. The rate of falls reported was higher for public hospitals (4.6 per 1,000 hospitalisations) than for private hospitals (1.3 per 1,000) (AIHW 2017b). The difference between the rates in public and private hospitals may reflect differences in casemix and recording practices (also see Chapter 1.4 'Indicators of Australia's health').



The data presented have some limitations. The indicator identifies falls that occur in any health service area, as it is not currently possible to identify those that occur just in hospitals. Therefore, rates may overestimate falls in hospitals. However, patients with an injury as the primary reason for hospitalisation are excluded to minimise including falls that occurred before admission. These rates may also be underestimated, as 18% of hospitalisations recording a fall did not state where it occurred.

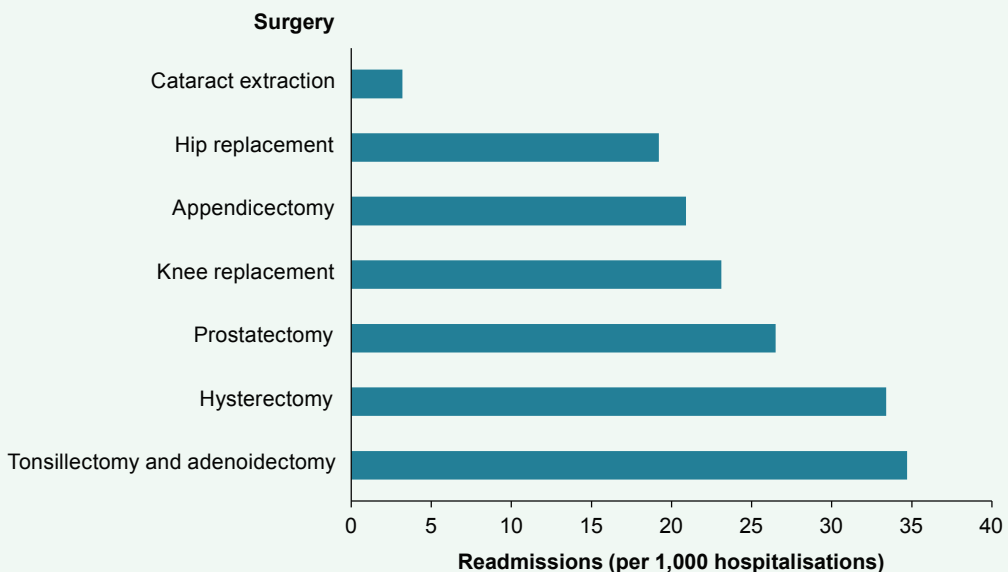
## Unplanned readmissions

This indicator includes hospitalisations for which an unplanned readmission to the same public hospital occurred within 28 days after surgery (for selected surgical procedures), and the cause of the hospitalisation was an adverse event. The diagnosis codes used to identify adverse events for unplanned readmissions are a subset of those used in 'Adverse events treated in hospitals'. 'Unplanned readmissions' account for 6.4% of hospitalisations with 'adverse events'.

Rates of unplanned or unexpected readmissions to the same public hospital were highest for *Tonsillectomy and adenoidectomy* (35 per 1,000 hospitalisations) and *Hysterectomy* (33 per 1,000 hospitalisations) (Figure 7.9.3). For *Cataract extraction*, only about 3 per 1,000 hospitalisations were readmitted within 28 days.

Routine linkage of hospital data will improve the reporting of this indicator by allowing an unplanned readmission to any, rather than the same, hospital to be identified (see section 'What is the AIHW doing?').

**Figure 7.9.3: Rate of readmission to the same public hospital within 28 days of surgery, selected types of surgery, 2015–16**



Source: AIHW 2017b; Table S7.9.3.

## Sentinel events

'Sentinel events' includes a subset of 'adverse events' that result in death or serious harm to a patient. They include events such as procedures for the wrong patient or body part that resulted in death or permanent loss of function, or an infant's discharge to the wrong family. Australian health ministers have agreed on a national core set of sentinel events (ACSQHC 2017b). This list is currently under review, with completion expected in 2018.

In 2014–15, there were 99 sentinel events in Australian public hospitals. The most commonly reported was *Retained instruments or other material after surgery requiring re-operation or further surgical procedure*, of which there were 33. The number of events ranged from 85 to 102 between 2010–11 and 2014–15 (SCRGSP 2017).

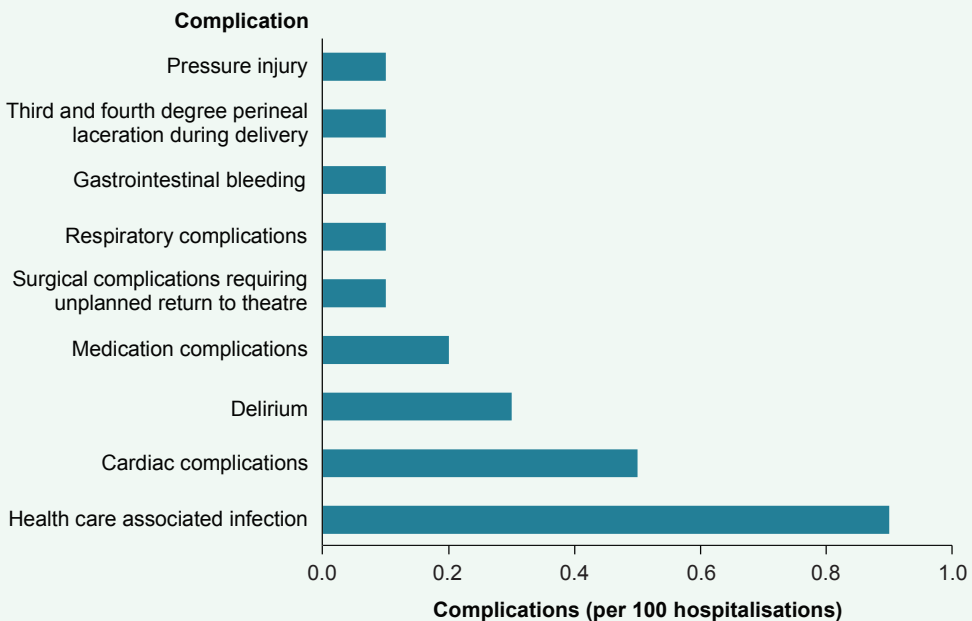
## Hospital-acquired complications

A hospital-acquired complication (HAC) is a complication for which clinical action may reduce (but not necessarily eliminate) the risk of its occurring—for example, selected infections or pressure injuries (ACSQHC 2017a). The nationally agreed Hospital Acquired Complications List can be found on the Commission's website.

There is overlap between the number of HACs and the number of hospitalisations that reported a hospital-acquired diagnosis (Box 7.9.3). There will also be some overlap with adverse events treated in hospitals, falls resulting in patient harm in hospital, and CDIs associated with health care.

In 2015–16, a HAC was reported for about 184,000 hospitalisations. The most common complication was *Healthcare associated infection* (Figure 7.9.4).

Figure 7.9.4: Rate of HACs, selected complications, all hospitals, 2015–16



Source: National Hospital Morbidity Database; Table S7.9.4.

Box 7.9.4 highlights some areas of work underway at the national level to support improved measurement of safety and quality of hospital care in the future. These relate broadly to improvements to data, and improvements in the integration of data.

## International comparisons

Australia also monitors the safety and quality of its health services through participation in the Organisation for Economic Co-operation and Development (OECD) Health Care Quality Indicators project. The OECD publishes selected data in its ‘Health at a glance’ series (OECD 2017). Table 7.9.1 lists the indicators related to patient safety against which Australian data were reported for the most recent OECD collection—and shows how Australia compares with other OECD countries. For this subset of indicators, rates were higher for Australia than the OECD average.

**Table 7.9.1: OECD selected patient safety indicators, Australia (2014–15) and OECD average (2015, or nearest year)**

Indicator	Australia	OECD average
<b>Rate per 100,000 surgical hospitalisations</b>		
Foreign body left in during procedure	8.8	5.4
Post-operative deep vein thrombosis in hip and knee surgeries	1,113	357
Post-operative pulmonary embolism in hip and knee surgeries	549	301
Post-operative sepsis in abdominal surgeries	2,658	2,117
<b>Rate per 100 vaginal deliveries</b>		
Obstetric trauma—vaginal delivery with instrument	7.2	5.7
Obstetric trauma—vaginal delivery without instrument	2.5	1.5

*Note:* Caution should be taken in interpreting these findings due to differences in data capture and reporting that may influence the reported rates.

*Source:* OECD 2017.

The OECD acknowledges the challenge in collating data of this type in a comparable manner, and suggests that some caution should be taken in interpreting the results. Differences in hospital admission practices, data coding practices, and sources of data (for example, whether they are based on hospital administrative data or registry-based data) can result in large variations in the rates reported.

## What is the AIHW doing?

The work that the AIHW is doing to set up routine linkage of data is outlined in Box 7.9.4. The AIHW's suite of products, including Australian hospital statistics and the MyHospitals website, are intended to inform the public on selected safety and quality measures at the national, state and territory and hospital level, on an annual basis.

### Box 7.9.4 Measuring safety and quality in the future

#### Improved data

Data on patient outcomes are central to assessing the safety and quality of hospital care. This article includes data on some outcome measures; however, there are currently limited national data on patient experience, and no nationally reported data on outcomes described by patients themselves. Routine collection of standardised patient-reported experience is important, as is further consideration of the most effective and efficient way to integrate patient-reported outcome measures.

Clinical Quality Registries (CQR) are an important means to monitor outcomes and drive quality improvements in care. Australian registries have evolved over time in a fragmented way. In 2016, Australian governments committed to developing a national CQR strategy to provide a systematic approach to funding and governing CQR for diseases, conditions and procedures with high cost and disease burden on the Australian health system. The aim is to optimise the use of CQR to inform safety and quality improvement purposes and patient outcomes.

The World Health Organization recently released the 11th revision of the International Classification of Diseases (ICD). The ICD-11 has several features that will enhance reporting on hospital care safety and quality. In particular, it will allow explicit linking between harm associated with hospital care and the mechanism and cause of the harm—for example, if a person bleeds heavily after a surgical procedure, the surgery (cause) will be able to be linked to the subsequent bleeding (harm). Concepts align with the current knowledge in adverse events and safety.

#### Improved integration of data

Improving the integration of hospital and other health service data at a national level will better support the measurement of safety and quality outcomes.

The AIHW is currently working with Australian, state and territory government authorities to establish routine linkage of data for hospitals, the Medicare Benefits Schedule, the Pharmaceutical Benefits Scheme, residential aged care, and deaths. Routinely linked data sets such as these will provide a stronger foundation to investigate patient outcomes after hospital care—not only as readmissions to hospital, but also as deaths, or through investigation of the patient's use of general practitioners or pharmaceuticals.

Integration of hospital data with other data sources, for example clinical-quality registries, and potentially the My Health Record in the future (see Chapter 2.4 'Digital health'), may also inform questions about the outcomes for patients after care in hospital.

## What is missing from the picture?

National reporting on safety and quality in hospitals has focused mainly on admitted care, rather than on care provided in outpatient and emergency departments. This is generally because the data collected for admitted care are more detailed and can better support investigation and reporting. The MyHospitals website (see 'What is the AIHW doing?') publishes safety and quality indicators for most public hospitals and some private hospitals. In 2017, the Productivity Commission suggested that more data were needed to better support patient choice in Australia (PC 2017) and noted the need to increase the number of indicators (particularly outcome indicators) reported for individual hospitals in the future. Expanding the number of private hospitals for which these data are separately reported is also important so as to provide patients and health providers with a more complete picture of hospital care.

It should be noted that the measurement of safety and quality is more developed for hospitals than other health sectors, or areas such as aged care and primary care.

## Where do I go for more information?

For more information on safety and quality of hospital care see the [Australian Commission on Safety and Quality in Health Care](#) website, [AIHW hospitals](#) page and [MyHospitals](#) website.

## References

- ACSQHC (Australian Commission on Safety and Quality in Health Care) 2013. Classification of hospital acquired diagnoses. Sydney: ACSQHC. Viewed 5 March 2018, <<https://www.safetyandquality.gov.au/our-work/indicators/classification-of-hospital-acquired-diagnoses/>>.
- ACSQHC 2014 Framework for Australian clinical quality registries. Sydney: ACSQHC.
- ACSQHC 2015. Australian Commission on Safety and Quality in Health Care annual report 2014/15. Sydney: ACSQHC.
- ACSQHC 2017a. Australian Commission on Safety and Quality in Health Care annual report 2016–17. Sydney: ACSQHC.
- ACSQHC 2017b. Australian sentinel events list. Sydney: ACSQHC. Viewed 20 February 2018, <<https://www.safetyandquality.gov.au/our-work/indicators/australian-sentinel-events-list./>>.
- ACSQHC 2017c. Vital signs 2017: the state of safety and quality in Australian health care. Sydney: ACSQHC.
- AIHW (Australian Institute of Health and Welfare) 2017a. *Staphylococcus aureus* bacteraemia in Australian public hospitals 2016–17: Australian hospital statistics. Health services series no. 83. Cat. no. HSE 198. Canberra: AIHW.
- AIHW 2017b. Admitted patient care 2015–16: Australian hospital statistics. Health services series no. 75. Cat. no. HSE 185. Canberra: AIHW.
- CFFR (Council on Federal Financial Relations) 2017 Addendum to the National Health Reform Agreement. Canberra: CFFR. Viewed 1 December 2017, <[http://www.federalfinancialrelations.gov.au/content/npa/health/other/Addendum\\_to\\_the\\_National\\_Health\\_Reform.pdf](http://www.federalfinancialrelations.gov.au/content/npa/health/other/Addendum_to_the_National_Health_Reform.pdf)>.
- HHA (Hand Hygiene Australia) 2017. National data 2017. Melbourne: HHA. Viewed 30 January 2018, <Hand Hygiene Australia - National Data>.
- OECD (Organisation for Economic Co-operation and Development) 2017. Health at a glance 2017: OECD indicators. Paris: OECD.
- NHIPP (National Health Information and Performance Principal Committee) 2017. The Australian Health Performance Framework. Viewed 16 February 2018, <[http://www.coaghealthcouncil.gov.au/Portals/0/OOS318\\_Attachment%201.pdf](http://www.coaghealthcouncil.gov.au/Portals/0/OOS318_Attachment%201.pdf)>.
- PC (Productivity Commission) 2017. Introducing competition and informed user choice into human services: reforms to human services. Draft report. Canberra: PC.
- SCRGSP (Steering Committee for the Review of Government Service Provision) 2017. Report on government services 2017. Canberra: PC.

## 7.10 Emergency department care

Emergency departments are a critical part of Australia's health care system, providing care for patients who require urgent medical attention.

Most larger public hospitals have purpose-built emergency departments. Some smaller public hospitals can also provide emergency services through informal arrangements.

Accident and emergency services can also be provided by private hospitals. In 2015–16, there were 36 private hospitals in Australia providing these services.

The information presented in this snapshot relates to the 287 Australian public hospitals with purpose-built formal emergency departments that are staffed 24 hours a day. These hospitals report to the AIHW's National Non-Admitted Patient Emergency Department Care Database (NNAPEDCD). The latest available estimate (2014–15) indicated that around 88% of all public hospital emergency services were provided in formal emergency departments covered by the NNAPEDCD.

### Emergency department presentations

In 2016–17, there were about 7.8 million presentations to public hospital emergency departments. This was an average of more than 21,000 each day across Australia.

Between 2012–13 and 2016–17, after adjusting for hospital coverage changes, the number of emergency department presentations increased by an average of 2.6% each year.

In 2016–17:

- emergency department presentations were evenly split for males (50%) and females (50%)
- the most common 10-year age groups presenting at emergency departments were people aged 25–34 (14%) and 15–24 (13%).

**Some population groups were over-represented in emergency department presentations compared with their representation in the population as a whole:**



**21%** were aged 65 and over (15% of the population)



**11%** were aged under 5 (7% of the population)



**6.5%** were Aboriginal and Torres Strait Islander people (3.3% of the population)

Patients who present to the emergency department are 'triaged' on arrival according to the urgency of their need for care. Fewer than 1% of emergency department presentations were assigned a triage category (see Glossary) of *Resuscitation* (those who need immediate treatment); 13% were assigned to *Emergency* (requiring attention within 10 minutes); 37% were *Urgent* (attention within 30 minutes); 41% were *Semi-urgent* (attention within 60 minutes); and 9.3% were *Non-urgent* (attention within 120 minutes).

The majority (75%) of people who presented to emergency departments either walked in, or came by private transport, public transport, community transport, or taxi. About 25% of presentations arrived by ambulance, air ambulance or helicopter rescue service, with 83% of *Resuscitation* patients arriving by this mode.

One-quarter (25%) of emergency department presentations had a diagnosis related to injury (including fractures and burns) or poisoning (see Chapter 3.15 'Injury').

Overall, around 31% of emergency department patients were admitted to hospital for further care and around 1.9% of patients were referred to another hospital for admission. Another 61% departed without being admitted or referred, and around 3.6% did not wait to be attended by a health care professional.

## Waiting time in emergency departments

Emergency department waiting time is the time that elapses from presentation in the emergency department to start of clinical care. In 2016–17, nationally, 50% of patients were seen within 19 minutes; 90% were seen within 95 minutes.

A patient is said to be 'seen on time' if the time between presentation at the emergency department and the start of their clinical care is within the time specified by the triage category to which they are assigned.

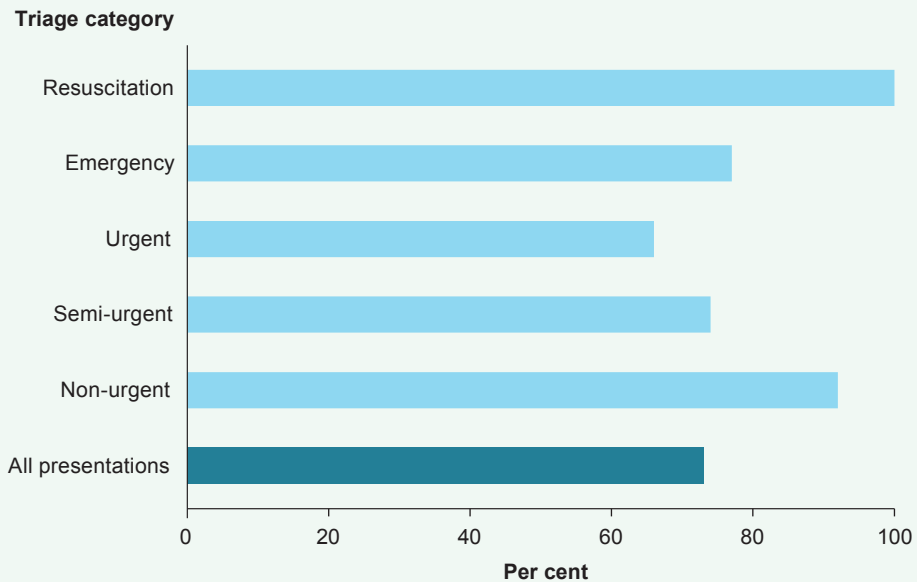
About 73% of emergency department presentations were seen on time, including almost 100% of *Resuscitation* patients and 77% of *Emergency* patients. For *Non-urgent* patients, the proportion seen on time was 92%—higher than that for patients assessed as *Urgent* and *Semi-urgent* (Figure 7.10.1).

The proportion of emergency department presentations seen on time was fairly stable between 2012–13 and 2016–17, ranging from 73% (in 2012–13 and 2016–17) to 75% (in 2013–14).

In 2016–17, about 72% of emergency department presentations were completed in 4 hours or less. This was slightly less than the equivalent figure for 2015–16 of 73%, but higher than the figure for 2012–13 of 67%.

For patients who were subsequently admitted, the proportion of presentations completed within 4 hours increased from 36% in 2012–13 to 49% in 2016–17.

Figure 7.10.1: Proportion of patients seen within the clinically recommended time, by triage category, 2016–17



Source: NNAPEDCD 2016–17; Table S7.10.1.

## What is missing from the picture?

The scope of the NNAPEDCD is limited to formal emergency departments in public hospitals. It may not be representative of emergency services provided in hospitals that do not have formal emergency departments.

It is not possible to determine whether the patient had been referred to the emergency department by another doctor or health service. It is also not possible to identify the admitted patient episode for those patients who are later admitted. Data linkage can improve the understanding of patient outcomes and pathways through the health system.

In 2016–17, principal diagnosis information was reported using a variety of classifications, and was only reported for about 96% of presentations. There was no information on the procedures or on other treatments provided in the emergency department.

## Where do I go for more information?

More detailed information can be found in the report [Emergency department care 2016–17: Australian hospital statistics](#).

Information about emergency occasions of service provided by private hospitals is reported to the Australian Bureau of Statistics Private Health Establishments Collection and is presented in the *Private hospitals, Australia* reports.



## 7.11 Elective surgery

Surgery that is planned and can be booked in advance is classified as elective surgery. Prioritising and scheduling patients for elective surgery is an important consideration for Australian hospitals.

Private hospitals report about two-thirds (67%) of the 2.2 million hospitalisations for elective surgery in Australia (1.5 million hospitalisations compared with about 733,000 for public hospitals in 2015–16). The most common procedure group reported for elective admissions involving surgery in both public and private hospitals were *Procedures on musculoskeletal system* (155,000 and 436,000, respectively). In public hospitals, these were followed by *Gynaecological procedures* (124,000) and *Dermatological and plastic procedures* (107,000). In private hospitals, the second and third most common procedure groups were *Procedures on eye and adnexa* (320,000) and *Dermatological and plastic procedures* (269,000).

Between 2011–12 and 2015–16, hospitalisations involving elective surgery rose by an average of 2.2% each year—2.5% in private hospitals and 1.7% in public hospitals.

For overnight hospitalisations involving elective surgery, the average length of stay was 3.6 days in public hospitals and 3.1 days in private hospitals.

### Elective surgery in public hospitals, 2016–17

In 2016–17, Australia's public hospitals admitted 748,000 patients from elective surgery waiting lists. For patients undergoing elective surgery:

- 22% were admitted for *General surgery* (surgery on organs of the abdomen, including breast surgery)
- 15% were admitted for *Orthopaedic surgery* (surgery on bones, joints, ligaments and tendons, including hip and knee replacements).

The most common type of surgery performed in 2016–17 was *Cataract extraction*, with 71,500 admissions. This was followed by *Cystoscopy* (56,000 admissions); *Skin lesion—excision of* (49,000); *Hysteroscopy, dilatation and curettage* (32,000); *Tonsillectomy* (removal of the tonsils and adenoids; 19,500); *Cholecystectomy* (19,000); *Total knee replacement* (17,000); *Inguinal herniorrhaphy* (hernia repair; 17,000); *Hysterectomy* (11,500); and *Total hip replacement* (11,000).

### Waiting times for elective surgery in public hospitals, 2016–17

Information on elective surgery waiting times is only available for patients admitted from public hospital waiting lists. These patients are assessed clinically by a surgeon, who determines the urgency of their need for surgery, before they are placed on a waiting list. Waiting time for elective surgery is calculated from the time a patient is placed on the waiting list until they are admitted for surgery.

In 2016–17:

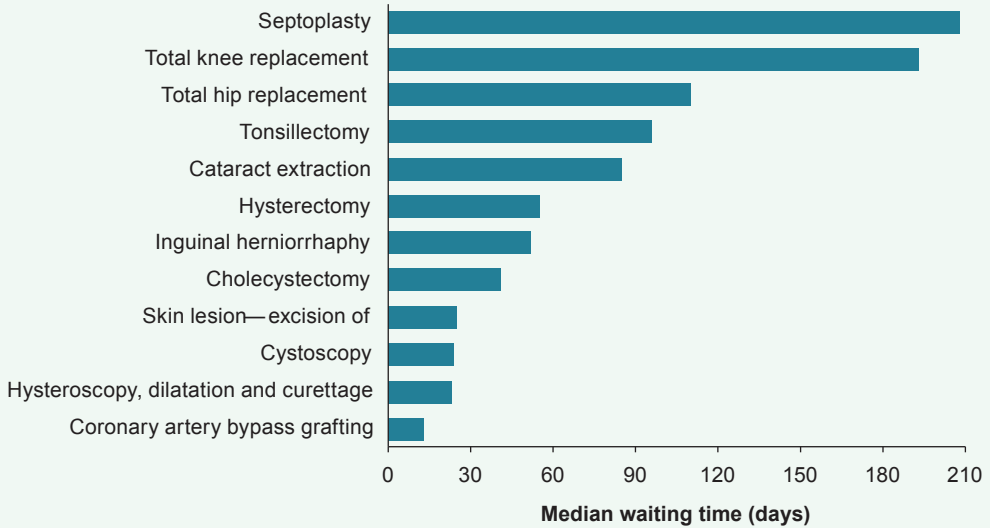
- the median waiting time (the time within which 50% of all patients were admitted) for elective surgery was 38 days
- 90% of all patients were admitted within 258 days
- just under 1.7% of people took longer than 365 days to be admitted for surgery
- median waiting times were longest in New South Wales (54 days) and shortest in the Northern Territory (28 days)
- the median waiting time for Aboriginal and Torres Strait Islander people was higher than for Other Australians—45 days and 38 days, respectively
- the surgical speciality with the longest median waiting time was *Ophthalmology surgery* (eye surgery), at 73 days; the shortest median waiting time was *Cardiothoracic surgery*, at 16 days
- the median waiting times for surgical procedures varied: it was 209 days for *Septoplasty* (surgery to correct the septum) and 13 days for *Coronary artery bypass graft* (Figure 7.11.1).

## Changes in elective surgery and waiting times in public hospitals

Between 2012–13 and 2016–17:

- admissions from public hospital elective surgery waiting lists increased by about 2.0% per year (after adjusting for the number of hospitals included)
- elective surgery admissions per 1,000 population increased by an average of 0.9% per year (after adjusting for the number of hospitals included)
- the largest annual increases in elective surgery admissions were for *Cystoscopy* (increasing by 5.0% each year, on average) and *Total hip replacement* (increasing by 4.4% each year, on average)
- the largest annual decrease in elective surgery admissions was for *Varicose vein treatment*, which decreased by around 2.6% on average each year
- the overall median waiting time for elective surgery tended to increase—it was 36 days in both 2012–13 and 2013–14, 35 days in 2014–15, 37 days in 2015–16 and 38 days in 2016–17
- the largest increase in median waiting times was for *Myringoplasty/tympanoplasty* (surgery to repair a perforated eardrum), increasing from 123 to 170 days
- the proportion of people who waited more than 365 days for elective surgery decreased, from 2.7% to 1.7%.

**Figure 7.11.1: Median waiting time (days) for admission to public hospital for selected surgical procedures, 2016–17**



Source: National Elective Surgery Waiting Times Data Collection; Table S7.11.1.

## What is missing from the picture?

There is no information available about waiting times for elective surgery in private hospitals.

Data on the urgency of the need for elective surgery have not been reported in this snapshot. In 2012, the AIHW and the Royal Australasian College of Surgeons worked together to develop national definitions for elective surgery urgency categories, at the request of the Standing Council on Health. The development of the national definitions resulted in a package of six integrated components proposed for adoption. These are outlined in *National definitions for elective surgery urgency categories: proposal for the Standing Council on Health*. The revised definitions were implemented in 2015; however, some inconsistencies still exist in the assignment of urgency categories between the states and territories. These inconsistencies are expected to decrease over the coming years.

The measurement of waiting time from placement on the elective surgery waiting list to hospital admission for that surgery does not take account of the time patients wait from their initial referral for consultation with a surgical specialist. Under the auspices of the Australian Health Minister's Advisory Council, the AIHW is progressing work to develop a nationally agreed approach for measuring access time to elective surgery that includes the time from referral.

## Where do I go for more information?

More information can be found in the reports *Elective surgery waiting times 2016–17: Australian hospital statistics*; *Admitted patient care 2015–16: Australian hospital statistics*; and the *National definitions for elective surgery urgency categories: proposal for the Standing Council on Health*.

# 7.12 Radiotherapy

Radiotherapy uses radiation directed at a localised area to kill or damage cancer cells. It is a well-established, effective and safe way to treat cancer and a small number of other conditions.

Radiotherapy is usually given as one of a series of outpatient treatments over a defined period, though under some circumstances patients may be treated as admitted patients. The optimal time frame for the treatment depends on whether it has a curative, prophylactic or palliative intent (see Glossary for definition of these treatment types).

There are several types of radiotherapy. The data in this snapshot relate to the most common form in Australia—megavoltage external beam radiotherapy, delivered by linear accelerator machines.

## Radiotherapy activity

About 60,600 courses of radiotherapy began in 2015–16 (delivered at 44 public sector sites and 33 private sector sites). For these courses:

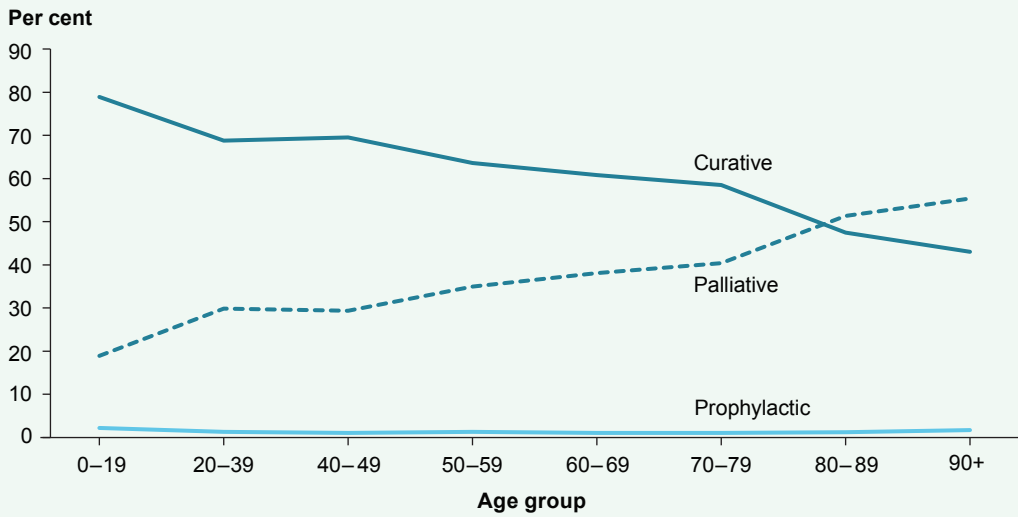
- 70% of patients starting a course of radiotherapy treatment were aged 60 and over
- breast, prostate and lung cancers were the most common reasons for radiotherapy
- more than half (58%) of the radiotherapy courses were intended to cure disease (curative), 38% were palliative and 1.1% were to prevent disease (prophylactic)
- there was a clear relationship between the age of the patient and whether the treatment was curative or palliative. The younger the patient, the more likely the treatment was intended to be curative (Figure 7.12.1)
- 2.0% of courses were clinically assessed as emergency treatment (that is, radiation treatment to begin within 24 hours), with most of these (96%) being palliative
- public providers delivered two-thirds (67%) of radiotherapy courses, while private providers delivered one-third (33%).

## Radiotherapy waiting times

In 2015–16, 50% of patients received treatment within 9 days of being assessed as ready for care, and 90% received treatment within 27 days.

Waiting times were shortest for patients receiving palliative radiotherapy, and longest for patients receiving curative radiotherapy (Figure 7.12.2). Palliative patients are more likely to need less complex treatment techniques, so their treatment can generally be scheduled around that for other patients without causing major delay for those patients (RANZCR 2013).

**Figure 7.12.1: Radiotherapy courses, by intention of treatment and age group, 2015–16**



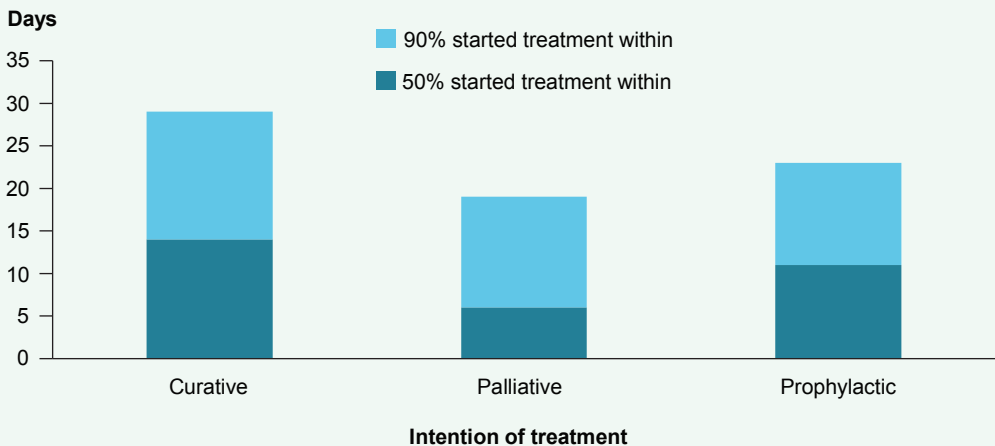
Source: AIHW 2017; Table S7.12.1.

For patients who were clinically assessed as emergency patients, 91% began treatment on the same or next day.

Waiting times for non-emergency courses were the same as for all courses, as most courses are non-emergency.

Of male patients with a principal diagnosis of prostate cancer, 50% started treatment within 10 days, and 90% within 29 days. Of female patients with a principal diagnosis of breast cancer, 50% started treatment within 8 days, and 90% within 28 days.

**Figure 7.12.2: Radiotherapy waiting times by intention of treatment, 2015–16**



Source: AIHW 2017; Table S7.12.2.

## What is missing from the picture?

Other waiting periods—such as the times between contacts with a general practitioner, medical oncologist and radiation oncologist, and the time between the first consultation with a radiation oncologist and the patient becoming ready for care—are not collected.

Agreement on appropriate benchmark waiting periods for non-emergency patients (for example, those based on relevant clinical characteristics) would allow better reporting of the appropriateness of waiting times for radiotherapy.

## Where do I go for more information?

More information on radiotherapy in Australia is available in the report [Radiotherapy in Australia, 2015–16](#), which can be downloaded for free.

## References

AIHW (Australian Institute of Health and Welfare) 2017. Radiotherapy in Australia 2015–16. Cat. no. HSE 191. Canberra: AIHW.

RANZCR (The Royal Australian and New Zealand College of Radiologists) 2013. Management of waiting lists in radiation oncology: quality in the timeliness of patient care. Sydney: RANZCR.

## 7.13 Organ and tissue donation

Organ and tissue donation involves retrieving organs and tissue from suitable donors to transplant into a recipient. There are two types of donation: deceased (after brain or cardiac death) and living.

- Organs that can be donated from deceased donors include the heart, lungs, liver, kidneys and pancreas.
- Living donors can donate a kidney or, in rare cases, partial liver.
- Tissues that can be donated include bone, tendons, ligaments, skin, and selected parts of the eye.

Depending on individual circumstances, more than one organ and/or tissue may be donated by one person; therefore the number of recipients will exceed the number of donors in any given year.

Few people die in a way that makes organ donation possible—in fact, only around 1–2% (around 1,100 in 2016) of people who die in hospital each year are suitable to become organ donors (OTA 2017a). When a person dies and donation is a possibility, the family's permission is sought.

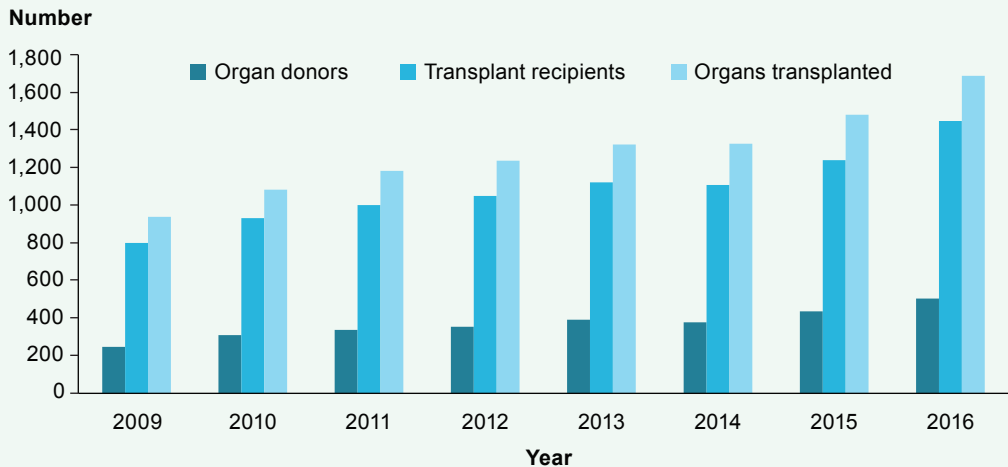
People aged 16 and over who wish to become donors can join the Australian Organ Donor Register at <[www.donatelife.gov.au](http://www.donatelife.gov.au)>, which is checked when the potential for donation arises. While the majority of Australians are willing to become donors (67%), only 34% are registered (OTA 2017a; Social Research Centre 2017, cited in OTA 2017b). Registration is important as 9 in 10 families agree to donation if their loved one was a registered donor and the family has prior knowledge of the donation decision.

Most kidneys and parts of liver transplanted from living organ donors are from donors genetically or emotionally related to the recipient. However, there are also donors through the Australian Paired Kidney Exchange Program. This program identifies matches for patients who are eligible for a kidney transplant, and have a living donor who is willing but unable to donate because of an incompatible blood or tissue type.

### Organ donation

In 2016, the number of deceased organ donors was the highest since national recording of organ donation began in 2009. In 2016, there were 503 deceased organ donors—more than double the number in 2009 (247). Between 2009 and 2016, the number of recipients increased from 799 to 1,447 (Figure 7.13.1). In 2016, there were 267 living organ donors who donated their kidney (265) or part of their liver (2) (OTA 2017a).

Figure 7.13.1: National deceased organ donations and transplants, 2009 to 2016



Sources: OTA 2016, 2017a; Table S7.13.1.

## Tissue donation

In 2016, there were 4,291 donors of tissue, including musculoskeletal, skin and cardiovascular tissue, excluding eyes. Of these, 424 were deceased donors, who gave 650 tissue donations. This was almost double the 327 tissue donations in 2012, the year national reporting on tissue donation began.

The 3,867 living tissue donors, who gave 3,923 tissue donations, excluding eyes, were mainly patients undergoing joint replacement surgery.

There were 1,281 deceased eye donors in 2016—an increase of 39% since 2009 (922) (OTA 2016a, 2017a).

## Transplants

Consistent with the growth in organ donation, the overall number of organs transplanted from deceased donors increased by 80%, from 938 organs in 2009 to 1,687 in 2016 (Figure 7.13.1). In 2016, kidneys were the organ most often transplanted from deceased donors (841), followed by liver (283) (OTA 2017a).

### Organs transplanted from deceased donors, 2016



Kidney **841**



Lungs **386**



Liver **283**



Heart **124**



Pancreas **52**

One intestinal transplant is not included.



In 2016, there were 2,085 corneal transplants, with all requests for eye tissue transplantation being met; transplant rates remained relatively consistent since 2012. There were 7,468 other tissue transplant recipients, most (95% or 7,073) of whom received musculoskeletal tissue. The number of tissue transplant recipients more than doubled from 3,691 in 2013 to 7,468 in 2016 (OTA 2017a).

## Organ transplant waiting list

At the start of 2016, there were 1,480 patients listed on solid organ transplant waiting lists. A further 1,609 new patients were listed during that year. Of the total number of wait listed patients in 2016:

- 1,447 received a transplant from a deceased donor
- 38 received a transplant from a living donor
- 259 were removed from the list for various reasons
- 35 died while on the waiting list (ANZDATA 2017).

## What is missing from the picture?

The AIHW's National Hospital Morbidity Database has information available on procedures, patient diagnoses and other information for most deceased donations, all live donations and all transplants. Further work could be undertaken to understand how these data could complement the Organ and Tissue Authority's reported data.

## Where do I go for more information?

More information on organ and tissue donation, including signing up to the Australian Organ Donor Register is available at <[www.donatelife.gov.au](http://www.donatelife.gov.au)>.

Some information on selected outcomes for organ transplants is available at the Australia and New Zealand dialysis and transplant registry.

## References

ANZDATA (Australia and New Zealand Dialysis and Transplant Registry) 2017. Australia and New Zealand Dialysis and Transplant Registry annual report. Section 12: organ waiting list. Adelaide: ANZDATA. Viewed 19 February 2018, <[http://www.anzdata.org.au/anzod/ANZODReport/2017/c12\\_waitinglist\\_v1.0\\_20171116.pdf](http://www.anzdata.org.au/anzod/ANZODReport/2017/c12_waitinglist_v1.0_20171116.pdf)>.

OTA (Organ and Tissue Authority) 2016. Australian donation and transplantation activity report 2015. Canberra: OTA. Viewed 29 November, 2017, <<http://www.donatelife.gov.au/sites/default/files/Australian%20Donation%20and%20Transplantation%20Activity%20Report%202015.pdf>>.

OTA 2017a. Australian donation and transplantation activity report 2016. Canberra: OTA. Viewed 22 November 2017, <<http://www.donatelife.gov.au/sites/default/files/Australian%20Donation%20and%20Transplantation%20Activity%20Report%202016.pdf>>.

OTA 2017b. Donation facts and statistics. Canberra: OTA. Viewed 22 November 2017, <<http://www.donatelife.gov.au/sites/default/files/Facts%20and%20Stats%20Fact%20Sheet%20-Feb%202017.pdf>>.

# 7.14 Labour, birth and outcomes

The health of a baby at birth is a key determinant of their health and wellbeing throughout life. Data on most births in Australia are collected by health professionals and included in the National Perinatal Data Collection. This snapshot uses these data to explore aspects of labour, birth and baby outcomes.

In 2015, about 304,300 women in Australia gave birth to around 309,000 babies, an increase in both the number of mothers who gave birth and babies born since 2005 (around 13%).

## Of births in 2015:



Mother's remoteness area of usual residence:

- 73%** Major cities
- 16%** Inner regional
- 8.4%** Outer regional
- 2.5%** Remote/Very remote



Baby boys slightly outnumbered baby girls:

- 51%** Boys
- 49%** Girls



Place of birth:

- 97%** were in a hospital
  - Public—**73%**
  - Private—**27%**



Aboriginal and Torres Strait Islander status:

- 4.3%** of mothers
- 5.4%** of babies



How labour started:

- 50%** spontaneous labour
- 29%** induced labour
- 21%** no labour onset



Pain relief:

- 77%** mothers in labour received pain relief

## Method of birth

Vaginal birth was the most common method of delivery of all mothers who gave birth in 2015 (2 in 3 women, or 67%). One in 3 (33%) women underwent a caesarean section, including women who:

- had no labour onset
- required a caesarean section after labour onset, *and/or*
- had decided to have a caesarean section during pregnancy.

In 2015, Aboriginal and Torres Strait Islander mothers were slightly less likely to have a caesarean section than non-Indigenous mothers (32% and 34%, respectively). They were also 7 times as likely as non-Indigenous mothers to be aged under 20 (15% compared with 2.1%).

Overall, vaginal birth rates have decreased while caesarean section rates have increased. In 2015, rates of spontaneous labour onset were higher among younger mothers.

Once labour starts, it may be necessary to intervene to speed up or augment the labour. Labour augmentation occurred for 16% of mothers in 2015; this rate was higher for first-time mothers (43% of women with spontaneous labour onset). See Chapter 7.15 'Caesarean sections' for more information.

## Gestational age of babies

The average gestational age for all babies was 38.6 weeks. This varied in relation to birth status (for example, liveborn or stillbirth) and multiple pregnancies (for example, twins and triplets). Babies of multiple pregnancies were more likely to be born preterm (64%) as were babies born to Indigenous mothers (14%).

**Gestational age** of live births:

**Preterm** (20–36 weeks) **8.7%**

**Term** (37–41 weeks) **91%**

**Post-term** (42+ weeks) **<1%**

## Birthweight

Birthweight is a key indicator of infant health and a determinant of a baby's chance of survival and health later in life. Incidence of babies born both small for gestational age and of a low birthweight was more common among babies born to mothers who smoked during pregnancy, Indigenous mothers and multiple births (twins, triplets). For all births in 2015, the average birth weight was 3,327 grams.

**Birthweight categories:**

**High:** 4,500 grams and over

**Normal:** 2,500–4,499 grams

**Low:** <2,500 grams

**Extremely low:** <1,000 grams



Babies born at a low birthweight:

**1 in 16** (6.5%)  
**liveborn**



Admission to special care nurseries (SCNs) and neonatal intensive care units (NICUs):

**74%** of preterm births

**60%** of twin births

**94%** of other multiple births

## Apgar Scores

Apgar scores are clinical indicators that determine a baby's condition shortly after birth. These scores are measured on a 10-point scale for several characteristics. An Apgar score of 7 or more at 5 minutes after birth indicates the baby is adapting well to the environment. In 2015, 98% of liveborn babies had an Apgar score of 7 or more at 5 minutes.

## Resuscitation and admission to special care nurseries and neonatal intensive care units

In 2015, 1 in 5 (19%) liveborn babies needed some form of active resuscitation immediately after birth. Resuscitation methods are undertaken to establish a baby's independent respiration and heartbeat or to treat respiratory effect and correct metabolic disturbances. These methods range from least severe (suction) to severe (external cardiac massage and ventilation). Admission to an SCN or NICU was required for 16% of liveborn babies, with preterm, multiple births and babies born to Indigenous mothers more likely to be admitted.

## Perinatal Mortality

Perinatal mortality is the death of a baby during the period immediately before birth (fetal death) and up to 28 days after birth (neonatal death). In 2015, there were 9 perinatal deaths for every 1,000 births (2,849 total). The most common cause of perinatal death was congenital abnormalities. Factors associated with higher rates of perinatal death were maternal age, maternal Indigenous status and multiple pregnancy. Perinatal mortality rates decreased dramatically as gestational age and birthweight increased.

In 2015, perinatal death rates in relation to gestational age were highest among babies born at 20–27 weeks' gestation (693 deaths per 1,000 births) and were lower among babies born at term (37–41 weeks) (2 deaths per 1,000 births). In relation to birthweight, perinatal death rates were highest among extremely low birthweight babies (691 per 1,000 births) and lowest among babies with a birthweight of 2,500 grams or higher (2 deaths per 1,000 births). The perinatal death rate increased among babies with a birthweight over 5,000 grams (10.3 per 1,000 births).

## What is missing from the picture?

Australia's maternal and perinatal mortality rates are among the lowest in the world. However, efforts to develop national data standards and to improve data availability and consistency will allow specific areas of concern to be better monitored and targeted by health services. The AIHW is currently working and consulting with jurisdictions to improve data availability and quality on maternal health conditions (hypertensive disorders, diabetes, overweight and obesity, and primary postpartum haemorrhage), baby resuscitation and induction of labour. Currently, data on these indicators are either inconsistent or require national data standards to be developed for mandatory data supply. More recent and consistent data on birth anomalies would also help to develop a better picture about labour, birth and baby outcomes.

## Where do I go for more information?

More information on Australia's mothers and babies, are available at [www.aihw.gov.au/reports-statistics/population-groups/mothers-babies/overview](http://www.aihw.gov.au/reports-statistics/population-groups/mothers-babies/overview).

The reports *Australia's mothers and babies 2015—in brief* and *Perinatal deaths in Australia 2013–2014* are available for free download.

## 7.15 Caesarean sections

Since 1985, the World Health Organization (WHO) has recommended a population caesarean section rate of 10–15% to ensure mortality rates are kept low for mothers and babies (RHR 2015). Of the close to 309,000 babies born to 304,300 women in 2015 in Australia, 33% (101,370) were born by caesarean section.

According to the latest Organisation for Economic Co-operation and Development (OECD) data, in 2014, Australia had the eighth highest caesarean section rate of 33 countries, with a caesarean rate of 34 per 100 live births—higher than the OECD average of 28 per 100 live births (OECD 2017). The caesarean section rate among OECD countries ranged from 16 per 100 live births for Finland to 53 per 100 for Turkey (OECD 2017).

### Caesarean section rates are increasing

Between 2005 and 2015, the rate of birth by caesarean sections in Australia continued to rise, from 30% of births in 2005 to 33% of births in 2015. Both emergency (unplanned) and elective (planned) caesarean section births have increased in Australia over time, but there seems to be a larger increase in rates of planned caesarean sections (ACSQHC 2017). As caesarean section rates increase, it is important that mothers are aware of the risks involved with this procedure, and that caesarean sections should occur only when there is a clinical need (RHR 2015).

### Variation in caesarean section rates

In 2015, of the 51,372 women who had previously had a caesarean section, most (85%) had a repeat caesarean section. Of all mothers who gave birth, having had a previous caesarean section was the most common reason given for having one in 2015. Nearly one-quarter (23%) of mothers had a primary caesarean section (that is, they had not had a caesarean section before).

Other factors related to mothers being more likely to have a caesarean section were:

- maternal age of 40 or more (52%)
- mothers who had a multiple birth (69% of twins and 88% of other multiples)
- mothers whose babies were breech, where the baby exits buttocks or feet first (87%).

Women who gave birth in a private hospital were also more likely to have a caesarean section (45%) than women who gave birth in a public hospital (30%) (Table 7.15.1).

Table 7.15.1: Factors related to mothers being likely to have a caesarean section, 2015

	Caesarean births	Vaginal births
<b>Previous caesarean</b>	85%	15%
<b>Total = 51,372</b>	Number = 43,584	Number = 7,787
<b>40 years and over</b>	52%	48%
<b>Total = 12,903</b>	Number = 6,734	Number = 6,168
<b>Twins</b>	69%	32%
<b>Total = 8,922</b>	Number = 6,111	Number = 2,810
<b>Other multiple births</b>	88%	12%
<b>Total = 237</b>	Number = 209	Number = 28
<b>Breech presentation</b>	87%	13%
<b>Total = 13,424</b>	Number = 11,703	Number = 1,720
<b>Birthed in a private hospital</b>	45%	55%
<b>Total = 79,525</b>	Number = 35,835	Number = 43,687

Note: Not stated values included in denominator 'Total'.

Source: National Perinatal Data Collection; Table S7.15.1.

## Rates using the Robson classification system

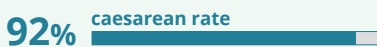
In 2015, the WHO guidelines were revised. The WHO now recommends that, rather than a population-based estimate of caesarean section rate, the Robson classification (also called the 10-group classification) be used to evaluate and compare caesarean section rates between groups of women (ACSQHC 2017; RHR 2015). This classification system groups women into 10 mutually exclusive groups based on obstetric characteristics, such as parity (number of previous pregnancies), onset of labour, whether there has been a previous caesarean section, and the baby's gestational age (RHR 2015).

The AIHW, in collaboration with the National Maternity Data Development Project Advisory Group, recently undertook preliminary work using the National Perinatal Data Collection 2015 data for the first time to group women into the 10 Robson classification categories. Women presenting with a breech pregnancy were most likely to have a caesarean section (92% for first pregnancies, 86% for subsequent pregnancies) followed by those with singleton pregnancies near term who had one or more previous caesarean sections (85%). Focusing on key groups within the Robson classification provides a more detailed understanding of caesarean section rates among different classification groups. This will allow a more targeted intervention, and further understanding of the relatively high caesarean section rate in Australia.

## Women who gave birth in 2015, by the ten Robson classification categories

First time mother, singleton pregnancy, baby in breech (feet first) presentation

6,076 women gave birth in this group  
5,574 had a caesarean section



Mother has previously given birth with current singleton baby in breech (feet first) presentation

4,714 women gave birth in this group  
4,066 had a caesarean section



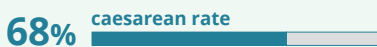
Mother has previously given birth with a previous caesarean scar, singleton pregnancy, baby in cephalic (head first) presentation, >37 weeks gestation, induced labour or caesarean section before labour

44,403 women gave birth in this group  
37,586 had a caesarean section



Multiple pregnancy, including women with previous caesarean scars

4,540 women gave birth in this group  
3,086 had a caesarean section



All women with a singleton pregnancy, baby in traverse (side on) or oblique lie, including women with previous caesarean scars

2,918 women gave birth in this group  
1,388 had a caesarean section



First time mother, singleton pregnancy, baby in cephalic (head first) presentation, >37 weeks gestation, induced labour or caesarean section before labour

54,043 women gave birth in this group  
24,447 had a caesarean section



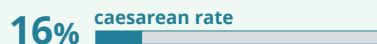
All women with a singleton pregnancy, baby in cephalic (head first) presentation, ≤ 36 weeks gestation, including women with previous caesarean scars

17,874 women gave birth in this group  
7,060 had a caesarean section



Mother has previously given birth without a previous caesarean scar, singleton pregnancy, baby in cephalic (head first) presentation, >37 weeks gestation, induced labour or caesarean section before labour

39,920 women gave birth in this group  
6,536 had a caesarean section



First time mother, singleton pregnancy, baby in cephalic (head first) presentation, >37 weeks gestation, spontaneous labour (not induced)

58,958 women gave birth in this group  
9,482 had a caesarean section



Mother has previously given birth without a previous caesarean scar, singleton pregnancy, baby in cephalic (head first) presentation, >37 weeks gestation, spontaneous labour (not induced)

68,537 women gave birth in this group  
1,676 had a caesarean section

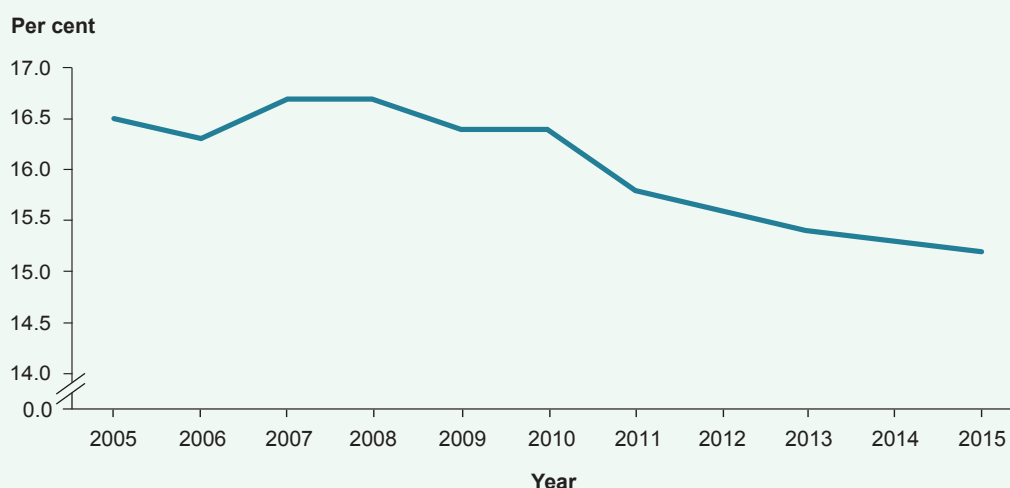


Source: National Perinatal Data Collection; Table S7.15.2.

## Vaginal births after caesarean section rates have declined over time

The rate of women opting for a vaginal birth after having had a previous caesarean section (VBAC) declined slightly between 2005 and 2015. The rate of mothers having a successful VBAC (with or without instrumentation) for their current birth was 16.5% in 2005, decreasing to 15.2% in 2015 (Figure 7.15.1).

Figure 7.15.1: Mothers who had a vaginal birth who have had a previous caesarean section, 2005 to 2015



Source: National Perinatal Data Collection; Table S7.15.3.

## Monitoring caesarean sections in Australia

The National Core Maternity Indicators (NCMIs) present information on measures of clinical activity and outcomes over time to monitor the safety and quality of maternity care. The indicators related to caesarean section in the NCMIs include 'Caesarean section for selected women giving birth for the first time' and 'Women having their second birth vaginally whose first birth was by caesarean section'. Monitoring the rates of caesarean sections is an important way to ensure that there is continual improvement in the quality of maternity services in Australia.

### What is missing from the picture?

There are limited data on caesarean sections, especially in terms of planned versus emergency caesarean sections. These data are essential if best evidence-based practices are to be implemented across settings, and to better inform policy decisions.

As noted in this snapshot, caesarean section rates using the Robson classification are a more effective way to view caesarean section rates than reporting a population rate. Future routine reporting and analysis of caesarean sections using this system will allow policy and practice to more effectively target specific groups of women.

### Where do I go for more information?

More information on mothers and babies in Australia, including the perinatal dynamic data displays and the National Core Maternity Indicators report and display, are available at [www.aihw.gov.au/reports-statistics/population-groups/mothers-babies/overview](http://www.aihw.gov.au/reports-statistics/population-groups/mothers-babies/overview).

The report *Australia's mothers and babies 2015—in brief* and other recent releases are available for free download.



## References

ACSQHC (Australian Commission on Safety and Quality in Health Care) 2017. The Second Australian Atlas of Healthcare Variation. Sydney: ACSQHC. Viewed 21 November 2017, <<https://www.safetyandquality.gov.au/atlas/atlas-2017/>>.

OECD (Organisation for Economic Co-operation and Development) 2017. Health at a glance 2017: OECD indicators. Paris: OECD Publishing. Viewed 27 November 2017, <[http://dx.doi.org/10.1787/health\\_glance-2017-en](http://dx.doi.org/10.1787/health_glance-2017-en)>.

RHR (Department of Reproductive Health and Research) 2015. WHO statement on caesarean section rates. WHO/RHR/15.02. Geneva: WHO. Viewed 21 November 2017, <[http://www.who.int/reproductivehealth/publications/maternal\\_perinatal\\_health/cs-statement/en/](http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/cs-statement/en/)>.



## 7.16 Variation in health care provision

The use of health care can vary according to where people live. Understanding variation across geographic areas is important to improve the quality, appropriateness and value of health care provided to patients. In 2017, the Australian Commission on Safety and Quality in Health Care (the Commission), in collaboration with the AIHW, published 'The second Australian atlas of healthcare variation' (the Atlas) (ACSQHC & AIHW 2017). The Atlas showed variation in health care use, depending on where people live.

### Why measure variation in health care provision?

Some variation in health care use is to be expected. It can be associated with differences in patients' health or personal preferences for treatment. However, in certain cases, some people may receive inappropriate or unnecessary care, while others may miss out on care that might be beneficial (unwarranted variation). Unwarranted variation may indicate:

- the need to deliver services more fairly based on patient need
- the need for patients to have better information on their options and on the likely benefits and harms of a particular treatment
- gaps in accessible evidence for clinicians and the need for evidence-based guidelines or clinical care standards
- the need for changes in clinical training
- the need to review whether financial incentives could be changed to encourage more appropriate care (ACSQHC & AIHW 2017).

Tackling unwarranted variation can help to improve the quality of health care. Measuring it is the first step.

Information on unwarranted health care variation—such as presented in the Atlas series—can stimulate further awareness and investigation of the variation, and can be used to promote strategies to reduce unwarranted variation. For example, in response to the Atlas series:

- states and territories and professional bodies have instigated quality improvement initiatives (for example, changes to clinical care models, development of further training for health professionals, and updating of clinical guidelines)
- the Commission has developed clinical care standards to promote appropriate care (for example, the 'Heavy menstrual bleeding clinical care standard') (ACSQHC 2017a)
- health services accredited under the National Safety and Quality Health Service Standards (ACSQHC 2017b) will be required to monitor and review clinical variation from 2019 onwards.

# Variation in the rates of selected health care

The Atlas included indicators for surgical interventions, women's health and maternity, chronic disease and infection, and cardiovascular conditions. Some summary findings are provided in this snapshot, and rates for hysterectomy are presented in more detail.

For example, the Atlas found that:

- the rate of hospitalisation for endometrial ablation (used to treat heavy menstrual bleeding) was 21 times as high in the Statistical Area Level 3 (SA3) with the highest rate compared with the SA3 with the lowest rate
- the rate of hospitalisation for lumbar spinal decompression (used to treat degeneration of the spinal joints) was 5.2 times as high in the SA3 with the highest rate compared with the SA3 with the lowest rate
- the rate for third or fourth degree perineal tears (tears of the skin and other tissues mainly during childbirth) per 1,000 vaginal births was 12 times as high in the SA3 with the highest rate compared to the SA3 with the lowest rate.

All rates are based on the population living in the area.

## Hysterectomy

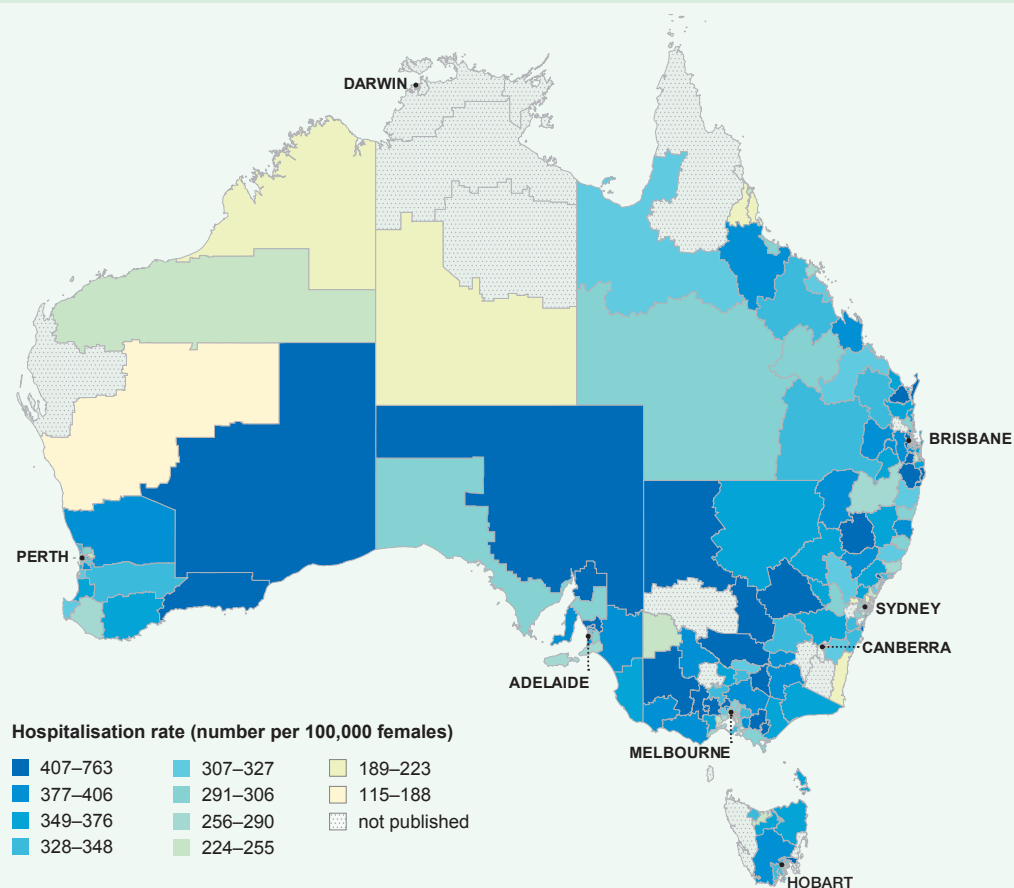
Hysterectomy, or the surgical removal of the womb (uterus), is a major surgical procedure commonly used to treat heavy menstrual bleeding. The Atlas examined rates of hysterectomy across Australia, excluding hysterectomies due to cancer. It found a 6.6-fold difference between the lowest and highest rate of hysterectomy between SA3s (Figure 7.16.1). Overall, rates were higher in *Inner regional* and *Outer regional* areas compared with *Major cities* or *Remote and Very remote* areas. The rate of hysterectomy for Aboriginal and Torres Strait Islander females was about 10% lower than the rate for other females.

Potential reasons for the variation, outlined in the Atlas, include differences in:

- patient education and awareness of treatment options
- patient preferences
- clinician awareness of the guidelines for the management of heavy menstrual bleeding
- access to primary care services
- private health insurance coverage.

Improving access to less invasive treatments, such as pharmaceutical treatments and endometrial ablation, may help some adolescents and women avoid the need for hysterectomy.

Figure 7.16.1: Age-standardised hospitalisation rate for hysterectomy, females aged 15 and over, by SA3, 2014–15



Note: For detailed maps of the capital cities see *The second Australian atlas of healthcare variation*.

Source: ACSQHC & AIHW 2017.

## What is the AIHW doing?

One of the key challenges in examining health care variation relates to the configuration of Australia's health data collections. Information about health care is recorded in a range of different collections, which can make it difficult to accurately monitor the care provided to patients. The AIHW, in collaboration with jurisdictions, is working to improve the integration of health services data—for example, routine linkage (for statistical purposes) of data for hospitals, Medicare Benefits Schedule, Pharmaceutical Benefits Scheme, residential aged care, and deaths—which will provide a better understanding of health care delivery and outcomes in the future.

## What is missing from the picture?

The data in the Atlas series provide an overarching picture of health care variation. Further investigation of factors that may explain some of the variation—such as disease prevalence or differing supply of health professionals across Australia—can be informative and has already been conducted by some jurisdictions and/or service providers in response to the Atlas series. The Atlas series focuses on a relatively small number of types of health care, sometimes depending on data availability. Analysis of variation, such as this, is potentially possible for a wide range of health services.

Understanding the outcomes for patients who have received health care—for example, patient-reported wellbeing or post-surgery outcomes—is also a key factor when considering variation. Improved collection and integration of outcome data at a national level will enhance the understanding of health care variation in the future.

## Where do I go for more information?

More information on health care variation is available in *The first Australian atlas of healthcare variation* and *The second Australian atlas of healthcare variation*.

The AIHW also publishes a range of data on health care variation across geographical areas, such as *Cancer screening in Australia*.

## References

- ACSQHC (Australian Commission on Safety and Quality in Health Care) 2017a. Heavy Menstrual Bleeding Clinical Care Standard. Sydney: ACSQHC. Viewed 29 November 2018, <<https://www.safetyandquality.gov.au/publications/heavy-menstrual-bleeding-clinical-care-standard/>>.
- ACSQHC 2017b. National Safety and Quality Health Service Standards. 2nd edn. Sydney: ACSQHC.
- ACSQHC & AIHW (Australian Institute of Health and Welfare) 2017. The second Australian atlas of healthcare variation. Sydney: ACSQHC.

## 7.17 Patient-reported experience and outcome measures

Patient-reported measures collect information about the experience of health services, and the outcomes of health services, as described by patients. They differ from many other measures of health service delivery which are based on information from providers of health services. Patient-reported measures can be used to measure health performance—for both national and local area monitoring—and to inform ongoing improvements in the quality of health services. Currently, their use is largely restricted to discrete health services and contexts (Thompson et al. 2016).

Interest is growing in strengthening and coordinating efforts to collect patient-reported information to benefit patients and the health system as a whole. To this end, patient reported measures have been included in the scope of the new Australian Health Performance Framework (AHPF) as measures for potential development to inform assessments of the appropriateness and safety of care in particular (NHIPPC 2017).

This article presents information on the current and potential use of patient-reported experience and outcome measures in Australia.

### Patient-reported experience measures

Patient-reported experience measures (PREMs) are used to obtain patients' views and observations on aspects of health care services they have received. This includes their views on the accessibility and physical environment of services (for example, waiting times and the cleanliness of consultation rooms and waiting spaces) and aspects of the patient–clinician interaction (such as whether the clinician explained procedures clearly or responded to questions in a way that they could understand).

### Patient-reported experiences in Australia

The Australian Bureau of Statistics Patient Experience Survey (PES) is undertaken annually to report on patient experiences of health care services (in general) in Australia. This national population-based survey collects information on the use of, and experiences with, selected health service providers by people aged 15 and over.

According to the PES, in 2016–17, 18% of people felt that they had waited longer than they felt was acceptable to get an appointment with a general practitioner (GP) in the last 12 months, and 21% had waited longer than they felt was acceptable for an appointment with a medical specialist.

For people who had seen a GP for urgent medical care at some stage in the last 12 months, 63% were able to see the GP within 4 hours of making an appointment at their most recent visit, but a quarter (25%) waited for 24 hours or more.

PES respondents reported that a high proportion of health professionals ‘always’ or ‘often’ listened carefully, showed respect, and spent enough time with them in their communications. Dental professionals were identified as most likely to always display these characteristics, with doctors and specialists in emergency departments least likely to do so (Figure 7.17.1). This may reflect the different nature of these health care interactions, and the circumstances in which these different services might be accessed.

**Figure 7.17.1: Key patient experience measures, selected health professionals, 2016–17**



Source: ABS 2017; Table S7.17.1.

The PES is useful to obtain a picture of how patients' view their experiences in accessing key health care services, and their satisfaction with aspects of the clinical interaction in general. The data it provides are used in national health performance assessment—for example, as reported in the *Report on Government Services* (SCRGSP 2018). However, they cannot be specifically used to support service improvement because they:

- relate to all relevant services provided in the last 12 months (and so do not necessarily relate to experiences with a single service provider or organisation)
- do not identify the specific service provider(s) used (and so information cannot be fed back to them)
- are not restricted to assessment of recent experiences; the information may be collected up to 12 months after the service was provided, which may influence responses provided.

## Using patient experiences data for service improvement

There are several programs in Australia where patient experience data are collected for specific services, and then fed back to service providers to drive continuing improvement of those services. Data may also be aggregated to allow some overarching monitoring of services. One such program is the Your Experience of Service survey, which has been adopted in some parts of the public mental health sector; the program aims to help mental health services and consumers work together to build better services (see Box 7.17.1).

There are a number of other standardised PREMs developed for general use across health services. Examples include the United Kingdom's National Health Service surveys, the Canadian Patient Experiences Survey and the Victorian Healthcare Experience Survey (CIHI 2018; Picker Institute Europe 2018; Victorian DHHS 2017a).

In relation to hospital care, the Australian Hospital Patient Experience Question Set (AHPEQS) has recently been developed. It is a nationally consistent tool for assessing patient experiences in the hospital sector in a way that can be fed back to providers. The AHPEQS is a set of 12 questions about a person's recent experience in a private or public hospital or day procedure service, regardless of their condition or the type of treatment they receive. The questions cover a range of aspects of their care and experience—such as patient involvement, responsiveness to needs, clear communication, patient safety, and harm and distress (ACSQHC 2017a). The questions were based on focus group discussions with Australian health care consumers, which identified the key dimensions seen to be important influences on the quality of their experience (Figure 7.17.2).

In the future, it is intended that the AHPEQS will provide a nationally consistent method to monitor and benchmark patient experience across Australia, for both public and private health care services. These data can then be used within services to drive improvement and, will, potentially, be a data source for the patient experience indicators anticipated in the AHPF.



### Box 7.17.1: Your Experience of Service Survey

Monitoring consumer and carer experiences of service is an action under the Fifth National Mental Health and Suicide Prevention Plan (The Fifth Plan) (CHC 2017).

All levels of government have had a long-standing interest in developing a standardised national measure of mental health consumer experiences of care that would support quality improvement, service evaluation and benchmarking between mental health services.

The Your Experience of Service (YES) survey was developed for use with public mental health services. It asks questions about patients' perceptions of their treatment and the care they received (for example, did they feel welcomed, respected and safe; were they provided with information about the service, their rights and responsibilities; and was a suitable care plan developed).

The YES survey is currently used in three states (New South Wales, Victoria and Queensland). In general, the survey form (which identifies the service provider) is offered to patients at discharge or at other appropriate intervals, and they complete it anonymously. Data are collated centrally, and an aggregated data report is provided to services to encourage review and continuous improvement.

Individual states have publicly reported on YES data. Some of the key findings presented in their reports are detailed here:

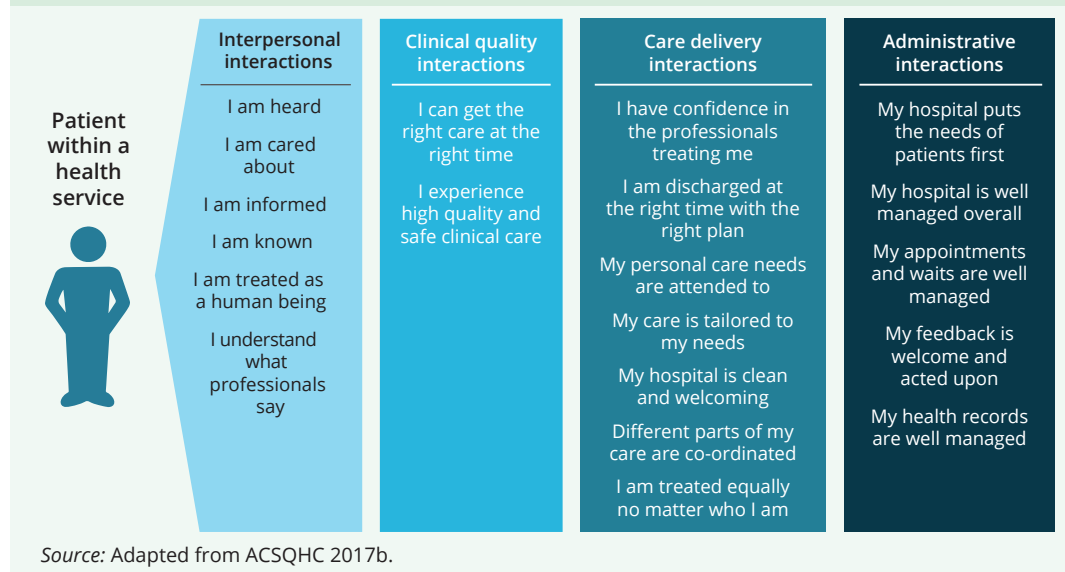
- In Victoria, nearly two-thirds (65%) of people who attended a clinical mental health service in the previous 3 months rated their experience as excellent or very good. The main factor associated with positive experiences was 'staff showing respect for your feelings', which was further influenced by 'feeling welcome', 'staff making an effort to see you when you wanted', 'staff showing hopefulness for the future' and 'respect for individual values and feeling safe' (Victorian DHHS 2017b).
- In New South Wales, 39% of people rated their overall experience as excellent and 28% as very good in 2016–17. Composite score data (based on responses to all relevant questions) in that state are also presented for local health districts/ specialty health networks and hospitals—which identify those services that have scores that are significantly more positive than the state average, and those that are significantly lower (NSW Ministry of Health 2017).
- In Queensland, 44% of people rated their overall experience as excellent, and 26% as very good in 2016. Across the state, the most positive scores were related to 'showing respect', 'ensuring safety and fairness' and 'supporting active participation'. Lower scores were given for 'providing information and support' and 'making a difference' (Queensland Health 2017).

These data are used at the statewide level to monitor services in general. The data for individual services are used by those services to compare their results with those of others, and to prioritise improvement activities.

The Fifth Plan commits governments to national pooling and reporting of YES survey data in the future.



Figure 7.17.2: Dimensions of patient experience (hospital care)



## Patient-reported outcome measures

As well as interest in activities aimed at expanding the use of PREMs, there is also strong interest in promoting and coordinating the use of patient-reported outcome measures (PROMs, see Box 7.17.2)—both in Australia and other countries.

The International Consortium for Health Outcomes Measurement (ICHOM), established in 2012, aims to promote the collection and reporting of common data for patients with identified health conditions, and to support international efforts to share data and improve health internationally. The ICHOM assembles global teams of stakeholders (including patients) to review existing instruments and recommend those that are valid and appropriate for use in a range of cultures. As well, they recommend additional data that should be collected and used in conjunction with health outcomes data (for example, information about the age of the patient and comorbidities that may affect expected outcomes).

Building on the work of the ICHOM, the Organisation for Economic Co-operation and Development (OECD) has prioritised activities to promote the coordinated use of standardised questionnaires within OECD member countries (including Australia) among priority population groups. This international coordination may provide opportunities for international comparison and data sharing in addition to national use. In the first instance, this work is focusing on patients who have undergone hip or knee replacement surgery, and patients who are receiving treatment for cancer or mental illness (OECD 2017).

Within Australia, the Australian Commission on Safety and Quality in Health Care is currently leading the development of a national approach to the routine use of PROMs to inform local evaluations and improvement. This will be based on three types of evidence:

- what has been shown to be effective (and ineffective) in health systems internationally where PROMs are already extensively used
- what is already happening in terms of PROMs use in the Australian health sector
- what Australian consumers and other stakeholders want and need.

### **Box 7.17.2: What are patient-reported outcome measures?**

PROMs are used to obtain information from patients on their health status, usually using standardised and validated questionnaires. When used before and after a health care intervention (or at points throughout a longer term therapeutic intervention), information on the self-reported changes in health status associated with these interventions are considered to be measures of health outcomes.

The questionnaires can be designed either for use with all patients—regardless of their health condition or the type of treatment they may be receiving—or for use with specific patient groups (for example, cancer patients).

Typically, PROMs for general use measure aspects such as overall health and wellbeing (or 'health-related quality of life'), the severity of symptoms such as pain, measures of daily functioning (activities required for self-care and to support social interactions) and psychological symptoms. The most common questionnaires used range in length from 5 to 36 questions, and typically ask respondents to assess attributes of their health and functioning on a rating scale.

Examples of general purpose PROMs in common use include the Short Form-36 (SF-36), Patient-Reported Outcomes Measurement Information System (PROMIS) and the World Health Organization Quality of Life Instrument (WHOQoL-BREF) (HealthMeasures 2018; Ware & Sherbourne 1992; WHO 2018).

Disease- or condition-specific PROMs are designed to assess aspects of health that might be more specifically associated with a particular health condition (Williams et al. 2016). For example, a measure designed for use in people who experience inflammatory bowel disease might include questions on bowel symptoms, as well as more general questions about pain and discomfort, fatigue, and ability to participate in activities.

The two types of PROMs have different uses. Generic PROMs can be used to compare the health gains across different health conditions. Condition-specific PROMs may be more useful in settings where the aim is to compare outcomes associated with different treatments for a specific condition.

## **What are the potential benefits of using PROMs?**

PROMs have long been used in research settings as part of the evaluation of health interventions. Their systematic use in real-world health care delivery settings is proposed to improve health systems on a number of levels (see, for example, Black 2013; Williams et al. 2016).

At the patient level, the collection of PROMs data can influence the patient–clinician interaction. It does this in two ways: by focusing attention on important aspects of patients' lives that might be affected by their health condition, and by providing a means to prompt discussion between the health care provider and the patient. This, in turn, can enhance information sharing (including about patients' priorities for their health care) and support shared decision making about treatments. In particular, aggregated PROMs

data could enhance shared decision making with patients by providing evidence-based information on expected outcomes at specific times after a health intervention (for example, at 2 weeks, 4 weeks and 3 months after a knee replacement). This information could help patients to make informed choices about their care.

At the service level, these data can be used for performance reporting and benchmarking by individual clinicians and/or health care services. In this way, providers can ensure that the outcomes achieved overall for their patients are comparable with those achieved by others (when adjusted for relevant patient characteristics). This information can then be used to review systems, processes and approaches to care (where poorer outcomes are seen), or to support sharing of information about good practices with better outcomes.

Another key potential use for PROMs lies in the ability of data—if available at the aggregate level and for a wide range of health services—to inform health care decisions at the system level. Specifically, if data were available about the improvements to health, quality of life and functioning status associated with specific health interventions or procedures (or the extent to which they slowed a decline in health status), this could substantially help the health system to re-focus on those interventions that deliver the best value for patients and for the system as a whole.

## Examples of the use of patient-reported outcome measures in health care delivery

This section describes some specific areas where there has been some cooperative effort in Australia to collect and share information about health outcomes (including patient-reported outcomes) associated with care. These are the Palliative Care Outcomes Collaboration (PCOC) and the Prostate Cancer Outcomes Registry.

### Palliative Care Outcomes Collaboration

The PCOC is a national program open to all palliative care service providers (providing either admitted patient or community-based services). It was set up in 2005. Participation is voluntary; in a recent period (January–June 2017), 127 services contributed data.

The program was established to promote the routine use of standardised, validated clinical assessment tools in clinical practice. One of the instruments used that is designed to be reported by patients is the Symptom Assessment Scale (Aoun et al. 2011), which measures distress associated with a range of symptoms. The instrument also allows assessment by proxy (for example, a carer) if the patient is unable to give the relevant rating directly.

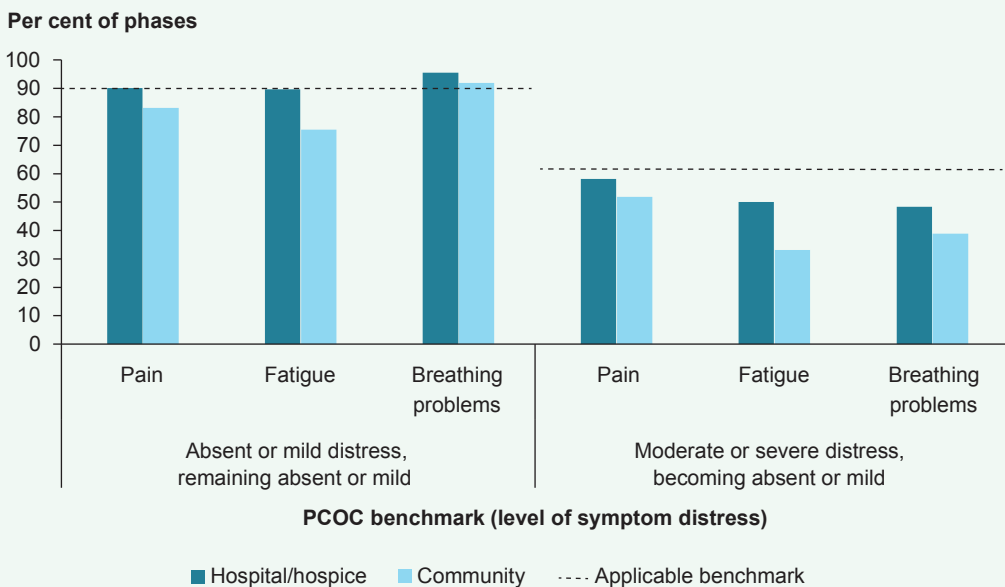
Assessments are conducted daily for admitted patients, or at contact for hospital consultative and community-based settings. Assessments can be done face to face or by telephone, as appropriate to the setting.

In this program, the data are primarily used as a benchmarking tool, rather than to formally evaluate different types of interventions. Outcomes data are collated, along with information about the patient's demographic profile, episode and setting of care, and phase of care (which provides information on the patient's needs and their clinical condition); these added data form an important context for analysis of the patient health status data. Summary reports are then returned to individual service providers to help in benchmarking. State, territory and national reports are also published. These reports compare aggregated data on a range of benchmarks that have been developed in consultation with participating services. For example, in relation to pain, fatigue and breathing problems, relevant benchmarks aim that:

- at least 90% of patients with absent or mild distress associated with the symptom (as measured by the Symptom Assessment Scale) at the start of their phase of palliative care have absent or mild distress at the end of the phase
- at least 60% of patients with moderate or severe distress associated with the symptom at the start of their phase of palliative care have absent or mild distress at the end of the phase (PCOC 2014).

For palliative care phases that ended between January and June 2017, relevant benchmarks were achieved (nationally) for patients who had absent or mild pain-related distress at the start of the care phase for hospital/hospice care only, and for patients who had absent or mild distress associated with breathing problems (for both hospital/hospice and community based care) (Figure 7.17.3). Nationally, relevant benchmarks were not met in the other areas, though these benchmarks were met in some individual services (Allingham et al. 2017).

**Figure 7.17.3: Proportion of palliative care phases where patient care met relevant PCOC benchmarks, by care setting, January–June 2017**



Source: Allingham et al. 2017; Table S7.17.2.

## Prostate Cancer Outcomes Registry

Clinical quality and population (disease- or condition-specific) health registries also provide a context in which patient-reported health outcomes data can be collected and used to assess treatments and services provided by specific health service providers (Williams et al. 2016).

One example is the Prostate Cancer Outcomes Registry–Australia and New Zealand. Established in 2013, it tracks the treatment and outcomes of men with prostate cancer (PCOR–ANZ 2016). Participating sites (distributed across most states and territories in Australia, and throughout New Zealand) recruit men diagnosed with prostate cancer to provide information about their treatment and other clinical data. Participants are then asked to periodically complete standardised questionnaires that capture data on their health-related quality of life. This includes reporting on symptoms that may be specifically associated with prostate cancer and its treatment (such as urinary continence and sexual functioning).

This information can be used to describe the patterns of treatment for patients (including those receiving no treatment, but who are under active surveillance) and enables monitoring of trends and benchmarking for all participating sites through public reporting at an aggregate level. As well, the data support activities to improve quality: reports sent back to participating sites and clinicians are framed in a way that allows them to compare their clinical practices and outcomes achieved for similar patients. The data can also be used to advise patients on the likelihood of symptoms associated with specific treatments and help them to understand how these might change over time.

As well, the data are made available to researchers, under specific conditions, to explore specific research questions.

## What is missing from the picture?

As already noted in this article, work is going on across the health sector to collect and report patient reported data on experiences of care and health outcomes; this is currently mainly restricted to selected settings and sectors. The value of these activities could be greatly enhanced by introducing more nationally coordinated technical and governance arrangements and by introducing improved data infrastructure. These activities could ensure that the data collected on outcomes and experiences are aligned (wherever possible). They also could establish a potential for national sharing of data or linkage arrangements to enable improvements in the delivery of health care at a range of levels.

## Where do I go for more information?

More information about the current use of PROMs in Australia and the AHPEQS is available at <[www.safetyandquality.gov.au](http://www.safetyandquality.gov.au)>.

More information on the YES survey for the mental health sector (including sample survey forms and application forms for use) is available in *Mental health services in Australia*, which is available for free download.

## References

- ABS (Australian Bureau of Statistics) 2017. Patient experiences in Australia: summary of findings, 2016–17 data cubes. ABS cat. no. 4839.0. Canberra: ABS. Viewed 24 January 2018, <<http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4839.02016-17?OpenDocument>>.
- ACSQHC (Australian Commission on Safety and Quality in Health Care) 2017a. Australian Non-proprietary Hospital Patient Experience Question Set (AHPEQS): status update. Viewed 20 December 2017, <<https://www.safetyandquality.gov.au/wp-content/uploads/2017/09/AHPEQS-update-for-web-September-2017.pdf>>.
- ACSQHC 2017b. Summary of development and testing of the AHPEQS, December 2017. Sydney: ACSQHC.
- Allingham S, Clapham S, Quinsey K, Mastroianni F & Foskett L 2017. Patient outcomes in palliative care: national results for January–June 2017, detailed report. Wollongong: Palliative Care Outcomes Collaboration, Australian Health Services Research Institute, University of Wollongong.
- Aoun SM, Montessoro L, Kristjanson LJ & McConigley R 2011. Measuring symptom distress in palliative care: psychometric properties of the Symptom Assessment Scale. *Journal of Palliative Medicine* 14(3):315–21.
- Black N 2013. Patient reported outcome measures could help transform healthcare. *British Medical Journal* 346:f167.
- CHC (COAG [Council of Australian Governments] Health Council) 2017. The Fifth National Mental Health and Suicide Prevention Plan. Canberra: Department of Health.
- CIHI (Canadian Institute for Health Information) 2018. Patient experience. Ottawa: CIHI. Viewed 24 January 2018, <<https://www.cihi.ca/en/patient-experience>>.
- HealthMeasures 2018. PROMIS. Evanston: Northwestern University. Viewed 24 January, <<http://www.healthmeasures.net/explore-measurement-systems/promis>>.
- NHPPC (National Health Information and Performance Principal Committee) 2017. The Australian Health Performance Framework. Viewed 16 February 2018, <[www.coaghealthcouncil.gov.au/Portals/0/OOS318\\_Attachment%201.pdf](http://www.coaghealthcouncil.gov.au/Portals/0/OOS318_Attachment%201.pdf)>.
- NSW Ministry of Health 2017. Your Experience of Service: what consumers say about NSW mental health services, 2016–17. Viewed 11 December 2017, <<http://www.health.nsw.gov.au/mentalhealth/Documents/yes-survey-report-2016-2017.pdf>>.
- OECD (Organisation for Economic Co-operation and Development) 2017. OECD work on health. Paris: OECD. Viewed 24 January 2018, <<http://www.oecd.org/health/Health-Brochure.pdf>>.
- PCOC (Palliative Care Outcomes Collaboration) 2014. Palliative Care Outcomes Collaboration: clinical manual. Wollongong: Australian Health Services Research Institute, University of Wollongong.
- PCOR–ANZ (Prostate Cancer Outcomes Registry–Australia and New Zealand) 2016. Prostate cancer outcomes Australia, 2016. Melbourne: Monash University. Viewed 24 January 2018, <[https://pcor.com.au/wp-content/uploads/2016/06/PCOR-ANZ-Annual-Report\\_2016\\_FINAL.pdf](https://pcor.com.au/wp-content/uploads/2016/06/PCOR-ANZ-Annual-Report_2016_FINAL.pdf)>.
- Picker Institute Europe 2018. NHS surveys. Oxford: Picker Institute Europe. Viewed 24 January 2018, <<http://www.nhssurveys.org/>>.
- Queensland Health 2017. Your Experience of Service: statewide report, 2016. Queensland Health: Brisbane.
- SCRGSP (Steering Committee for the Review of Government Service Provision) 2018. Report on government services, 2018. Part E, Chapter 10: Primary and community health. Viewed 29 March 2018, <[www.pc.gov.au/research/ongoing/report-on-government-services/2018/health/primary-and-community-health](http://www.pc.gov.au/research/ongoing/report-on-government-services/2018/health/primary-and-community-health)>.
- Thompson C, Sansoni J, Morris D, Capell J & Williams K 2016. Patient-reported outcome measures: an environmental scan of the Australian healthcare sector. ACSQHC: Sydney.
- Victorian DHHS (Victorian Department of Health and Human Services) 2017a. Victorian Healthcare Experience Survey—VHES. Melbourne: Victorian DHHS. Viewed 24 January 2017, <<https://www2.health.vic.gov.au/hospitals-and-health-services/quality-safety-service/patient-experience-survey>>.
- Victorian DHHS 2017b. Victoria's mental health services annual report, 2016–17. Victorian DHHS: Melbourne.
- Ware JE & Sherbourne CD 1992. The MOS 36-item Short Form Health Status Survey (SF-36): 1, conceptual framework and item selection. *Medical Care* 30:473–83.
- Williams K, Sansoni J, Morris D, Grootemaat P & Thompson C. 2016. Patient-reported outcome measures: literature review. ACSQHC: Sydney.
- WHO (World Health Organization) 2018. WHO Quality of Life-BREF (WHOQOL-BREF). Geneva: WHO. Viewed 24 January 2018, <[http://www.who.int/substance\\_abuse/research\\_tools/whoqolbref/en/](http://www.who.int/substance_abuse/research_tools/whoqolbref/en/)>.

## 7.18 Coordination of health care

Coordination of health care involves the delivery of consistent, coherent and connected health services to patients. These factors are what enables and sustains:

- an ongoing relationship between a patient and a provider
- the timely transfer of relevant patient information between different care providers
- the cooperation between these providers to allow for the provision of connected health care (RACGP 2017).

Coordination of health care is particularly important for the growing number of patients with multiple diseases or complex care needs, such as people living with cancer, arthritis, cardiovascular disease and mental illness (Primary Health Care Advisory Group 2016).

The Coordination of Health Care Study (the Study) aims to fill a national data gap by providing nationally consistent and locally relevant results, allowing for valid comparisons between local areas to inform policy efforts.

### Box 7.18.1: Survey of Health Care

The Survey of Health Care 2016 (the Survey)—the first component of the Study—looks at experiences with coordination of health care for people aged 45 and over who had at least 1 general practitioner (GP) visit in the 12 months before being selected for the survey (November 2014 to November 2015).

The Survey was conducted from April 2016 to June 2016. All responses relate to the 12 months before the time that each respondent completed the survey. The Survey explored:

- whether people had a relationship with a usual GP or place of care
- respondents' experiences with person-centred care and with transfer of information between a GP or practice and hospitals, emergency departments and specialists
- respondents' access and barriers to care.

All results reported in this snapshot come from the Survey. For detailed results, see *Survey of Health Care Australia, 2016* (ABS & AIHW 2017).

## Relationship with usual GPs/usual place of care

GPs are the first point of contact for many Australians with health problems. GPs deliver a variety of care—treating short-term and long-term illnesses and providing preventive care and health education. A usual GP/usual place of care is one to which people choose to visit consistently (if possible) when they need health care. This is often because a person and their usual GP/usual place of care have built mutual knowledge, understanding and trust—reasons associated with positive outcomes, such as better quality of care, better GP–patient communication and greater uptake of preventive and health promotion strategies.



In 2016, based on responses to the self-reported Survey (see Box 7.18.1):

- 98% of people were estimated to have a usual GP/usual place of care
- 65% of people with a usual GP reported that they had been going to their GP for 5 or more years
- people aged 65 and over were more likely to have a usual GP than people aged 45–64 (94% compared with 83%) (ABS 2017).

Overall, people were positive about their experiences with those aspects of the health system surveyed, with 96% reporting that they received excellent, very good or good-quality care from their usual GP/usual place of care.

In 2016, most people said that their usual GP/usual place of care:

- was always or usually aware of their health care history (85%)
- always or usually involved them in making decisions about their health care (88%)
- always or usually explained test results, such as blood tests and x-rays, in a way that could be understood (88%)
- always or usually asked about things in work or life that affected their health (56%)
- made them feel completely or very comfortable talking about personal problems related to their health (80%) (ABS 2017).

For a full breakdown of the response categories to the surveyed aspects of a patient's experience with their usual GP/usual place of care, see Supplementary Table S7.18.1.

## Coordination between GPs and other health providers

Effective communication and timely transfer of information between a patient's usual GP/usual place of care and other health care providers is essential to allow consistent and continuous care to be provided in the right place and at the right time.

In 2016, results varied for the proportion of people who reported that their usual GP or others in their usual place of care seemed informed about the care they had received from other health providers.

More than half (55%) of people saw a specialist doctor for their own health. Of these people:

- 76% said their usual GP/usual place of care seemed informed about the care they had received from the specialist doctor
- 8.7% said their usual GP/usual place of care did not seem informed about the care they had received from the specialist doctor, or did not seem to know about it until the patient told them (ABS 2017).

Almost 1 in 5 (18%) people reported visiting an emergency department. Of these people:

- 62% said their usual GP/usual place of care seemed informed about follow-up needs or medication changes after their visit to the emergency department
- 18% said their usual GP/usual place of care did not seem informed about the follow-up needs or medication changes after their visit to the emergency department, or did not seem to know about it until the patient told them (ABS 2017).

Slightly more than 1 in 5 (22%) people were admitted to hospital. Of these people:

- 66% said that their usual GP/usual place of care seemed informed about the follow-up needs or medication changes after their hospital admission
- 11% said that their usual GP/usual place of care did not seem informed about the follow-up needs or medication changes after their hospital admission, or did not seem to know about it until the patient told them (ABS 2017).

About 4 in 5 (82%) people reported taking at least one type of medication on an ongoing basis and 71% reported that they had had a test, x-ray or scan. Of these people who took medications or had tests:

- 72% said that a health professional reviewed all medications being taken
- 4.2% said they had been given a wrong medication or dose by a doctor, nurse or pharmacist
- 89% said that results from blood tests, x-rays or scans were available at their scheduled health care appointment (ABS 2017).

The proportions presented for the response categories do not add up to 100% as not all categories are shown here. For a full breakdown of the response categories to the surveyed aspects of a patient's experience with the transfer of information between other health care providers and their usual GP/usual place of care, see Supplementary Table S7.18.2.

## What is the AIHW doing?

The second part of the Study involves linking data from the 2016 Survey of Health Care for consenting participants with specific data items from the Medicare Benefits Schedule and Pharmaceutical Benefits Scheme (including Repatriation Pharmaceutical Benefits Scheme data). The data will also be linked with hospitalisation data, including visits to emergency departments and admissions to hospital. This analysis is being undertaken in 2018, and will allow for a broad range of research and policy issues related to health care to be explored. The outcomes of these undertakings will be detailed in future AIHW and Australian Bureau of Statistics (ABS) publications.

## What is missing from the picture?

The Survey of Health Care captures data only on those aged 45 and over who had seen a GP in the 12 months before being selected for the survey. As a result, the data cannot be used to investigate unmet health needs for the whole population; for example, data on patient experiences with the coordination of health care is required for younger age groups. Further analysis of the existing survey data can also provide insight into the experiences of patients with more complex needs, such as multiple long-term health conditions.

## Where do I go for more information?

The joint ABS and AIHW publication *Survey of Health Care Australia 2016* is available at <[www.abs.gov.au](http://www.abs.gov.au)>.

## References

ABS (Australian Bureau of Statistics) 2017. Survey of Health Care publication tables, 2016. ASB cat. no. 4343.0. Canberra: ABS.

ABS & AIHW (Australian Institute of Health and Welfare) 2017. Survey of Health Care Australia 2016. ABS cat. no. 4343.0. Canberra: ABS & AIHW.

Primary Health Care Advisory Group 2016. Better Outcomes for People with Chronic and Complex Health Conditions. Canberra: Department of Health.

RACGP (The Royal Australian College of General Practitioners) 2017. Standard for General Practices: 5th edition. Melbourne: RACGP. Viewed 21 February 2018, <[https://www.racgp.org.au/your-practice/standards/standards-for-general-practices-\(5th-edition\)/](https://www.racgp.org.au/your-practice/standards/standards-for-general-practices-(5th-edition)/)>.



## 7.19 Specialised alcohol and other drug treatment services

Alcohol and other drug treatment services help people to deal with their drug use through a range of treatments. Treatment objectives can include reducing or stopping drug use, and improving social and personal functioning. Treatment services include detoxification and rehabilitation, counselling and pharmacotherapy, delivered in residential and non-residential settings. Opioid pharmacotherapy is one treatment for dependence on opioid drugs, such as heroin and morphine.

Information on publicly funded alcohol and other drug treatment services in Australia and on the people and drugs treated is collected through the Alcohol and Other Drug Treatment Services National Minimum Data Set (AODTS NMDS). The National Opioid Pharmacotherapy Statistics Annual Data (NOPSAD) collection contains information on pharmacotherapy treatment—that is, opioid substitution therapy (OST)—provided to people dependent on opioid drugs.

Agencies whose sole function is to prescribe or provide dosing services for opioid pharmacotherapy are excluded from the AODTS NMDS as data from these agencies are captured in the NOPSAD collection.

### Who uses alcohol and other drug treatment services?

In 2016–17, 836 publicly funded alcohol and other drug treatment agencies provided more than 200,000 closed treatment episodes to around 127,000 clients aged 10 and over, who sought specialist alcohol and other drug treatment services.

Clients of alcohol and other drug treatment services were more likely to be male than female, and most likely to be aged 20–39. Aboriginal and Torres Strait Islander people were over-represented among clients seeking alcohol and other drug treatment services (15% of all clients compared with 2.7% of the Australian population aged 10 and over).

#### Who uses alcohol and other drug treatment services?



2 in 3 were male



Around 1 in 7 were Indigenous



More than half were aged 20–39

# Who receives opioid pharmacotherapy treatment?

On a snapshot day in mid-2017, nearly 50,000 clients received opioid pharmacotherapy treatment at more than 2,700 dosing points across Australia.

Clients receiving opioid pharmacotherapy treatment had broadly similar characteristics to the clients receiving alcohol and other drug treatment services, but were more likely to be slightly older. Pharmacotherapy clients were more likely to be male than female, and most likely to be aged 30–49. Indigenous Australians were over-represented among pharmacotherapy clients (9.2% of all clients compared with 3.3% of the total Australian population).

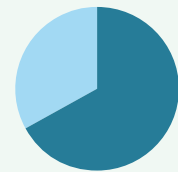
## Who receives opioid pharmacotherapy treatment?



2 in 3 were male



Around 1 in 11 were Indigenous

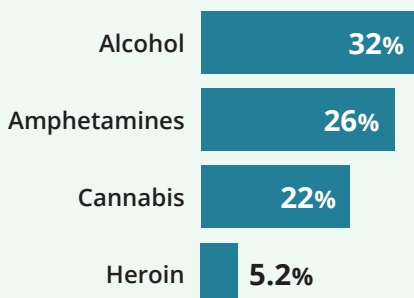


Two-thirds were aged 30–49

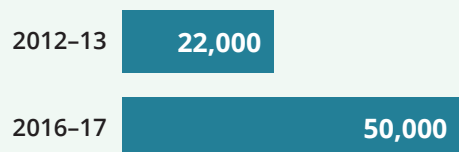
# For which drugs do people seek treatment?

In 2016–17, alcohol was the principal drug of concern that led to the largest percentage of clients to seek alcohol and other drug treatment services. Over the last 5 years, however, the percentage of clients seeking alcohol treatment services has fallen slightly. Over the same period, the percentage of treatment episodes attributable to amphetamines as a principal drug of concern has more than doubled.

## The top drugs that led clients to seek treatment were:

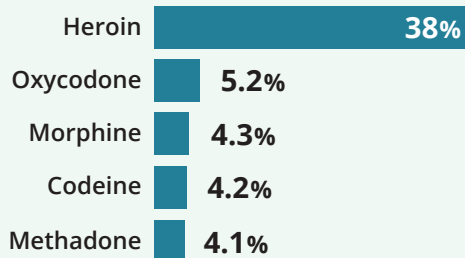


The fastest growing treatment area is for **amphetamine use**, with treatment episodes **more than doubling the last 5 years**:



In 2017, heroin continued to be the most common principal drug of concern for clients receiving opioid pharmacotherapy treatment, with methadone the most common form of OST provided.

The top opioid drugs that led clients to seek pharmacotherapy were:

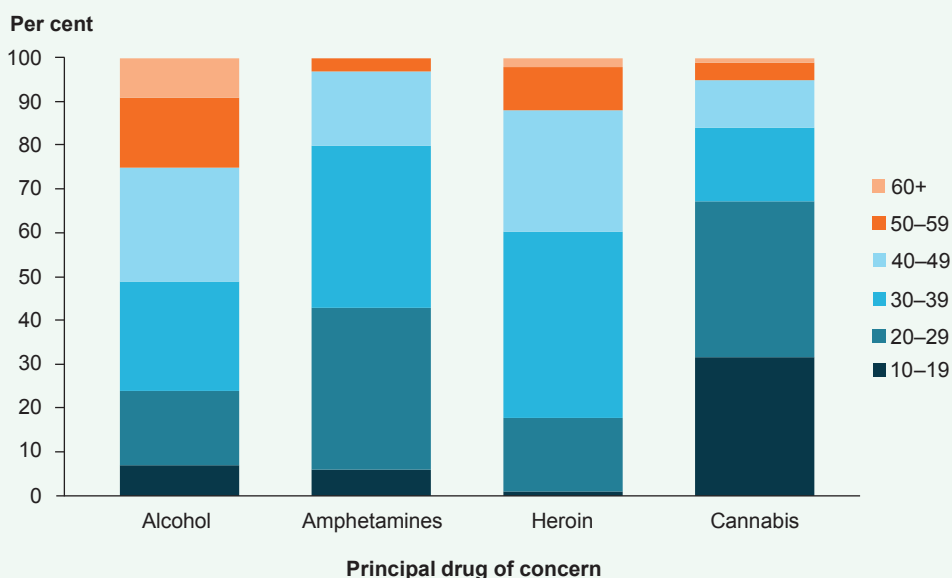


## Alcohol and other drug treatment patterns across age groups

There were notable differences by age group in the most common principal drugs of concern for which alcohol and other drug treatment services were provided in 2016–17 (Figure 7.19.1):

- where cannabis was the principal drug of concern, most clients of these services tended to be younger; with 36% aged 20–29 and 32% aged 10–19
- where amphetamines were the principal drug of concern, most clients (73%) were aged 20–39
- where alcohol was the principal drug of concern, most clients were older; with 51% aged 40 and over and only 6.9% aged 10–19.

Figure 7.19.1: Principal drug of concern for clients by age group, 2016–17



Source: AIHW 2018a; Table S7.19.1.

## What is missing from the picture?

It is difficult to quantify fully the scope of alcohol and other drug treatment services in Australia. There are a variety of settings in which people receive treatment for alcohol and other drug-related issues that are not in scope for the AODTS NMDS. These include services provided by not-for-profit organisations and private treatment agencies that do not receive public funding; some treatment services provided in hospitals by specialist alcohol and other drug treatment services, prisons, correctional facilities and detention centres; primary health care services; and accommodation services.

Because of the specifications for each data collection (AODTS NMDS and NOPSAD) and the complexities of the sectors, it is not possible to identify people who receive a course of pharmacotherapy treatment via a dosing point as well as treatment from a publicly funded alcohol and other drug treatment service. Also, the AODTS NMDS does not cover all agencies providing substance-use services to Indigenous Australians.

The AODTS NMDS does not currently include data describing the mode of delivery for a client's main treatment type, or data describing treatment outcomes or treatment waiting times. The AIHW is investigating options to deal with these data gaps, intending that such data may become available in future iterations of the collection.

## Where do I go for more information?

More information on specialised alcohol and other drug treatment services in Australia is available at <[www.aihw.gov.au/reports-statistics/health-welfare-services/alcohol-other-drug-treatment-services/overview](http://www.aihw.gov.au/reports-statistics/health-welfare-services/alcohol-other-drug-treatment-services/overview)>.

The reports *Alcohol and other drug treatment services in Australia 2016–17* and *National opioid pharmacotherapy statistics 2017* can be downloaded from the AIHW website: <[www.aihw.gov.au](http://www.aihw.gov.au)>.

## References

AIHW (Australian Institute of Health and Welfare), forthcoming 2018a. Alcohol and other drug treatment services in Australia 2016–17. Canberra: AIHW.

AIHW 2018b. National opioid pharmacotherapy statistics 2017. Canberra: AIHW. Viewed 17 April 2018, <[www.aihw.gov.au/reports/alcohol-other-drug-treatment-services/nopsad-2017/contents/summary](http://www.aihw.gov.au/reports/alcohol-other-drug-treatment-services/nopsad-2017/contents/summary)>.

## 7.20 Mental health services

Mental illness contributes substantially to the burden of disease in the community (see Chapter 3.12 'Mental health'). In Australia, people with mental disorders can access a variety of support services, delivered by the Australian Government and state and territory governments and by the private and not-for-profit sectors. A range of health care professionals provide these services in a number of care settings.

This snapshot provides a brief overview of the volume of mental health service activity, the associated workforce, and ongoing efforts to improve the safety and quality of mental health care in Australia.

Where might people go for mental health care?	Who might people see for mental health care?
Specialised hospital services—public and private	General practitioners
Residential mental health services	Psychiatrists and other medical staff
Community mental health care services	Psychologists
Private clinical practices	Nurses—registered and enrolled
Non-government organisation services	Social workers
	Other allied health professionals
	Peer workers
	Other personal care staff

### Service use

A considerable number of support services are provided to people with a mental illness each year. For example, state and territory community mental health care services provided more than 9.4 million contacts in 2015–16 (Table 7.20.1).



**Table 7.20.1: Selected mental health-related services provided, 2015–16/2016–17<sup>(a)</sup>**

Service type	Volume	Selected findings
Medicare-subsidised mental health-related services <sup>(b)</sup>	11.1 million services	General practitioners (GPs) (31%) were the largest providers of these services.
People accessing Medicare-subsidised mental health-related services <sup>(b)</sup>	2.4 million people	Females accessed these services at a rate of about 1.5 times that of males.
Mental health-related prescriptions <sup>(c)</sup>	36 million prescriptions	Antidepressant medication accounted for about 69% of all mental health-related prescriptions <sup>(c)</sup> .
Community mental health care service contacts	9.4 million contacts	More than 1 in 5 contacts were provided to patients with a principal diagnosis of schizophrenia.
Emergency department services	273,000 presentations	Aboriginal and Torres Strait Islander people accounted for 10% of mental health-related presentations.
Overnight admitted patient hospitalisations	244,900 hospitalisations	Overnight admitted patient hospitalisations with specialised mental health care made up about 64% of all overnight mental health-related hospitalisations.

(a) Medicare and prescription data shown are for 2016–17.

(b) Includes psychiatrists, GPs, clinical psychiatrists, other psychologists and other allied health services. These services are billed as mental health-related items, which underestimates the total mental health-related activity, especially for services provided by GPs.

(c) Prescriptions subsidised and under co-payment under the Pharmaceutical Benefits Scheme and Repatriation Pharmaceutical Benefits Scheme.

## Spending

About \$9 billion, or \$373 per person, was spent on mental health-related services in Australia during 2015–16—representing 7.7% of total government health expenditure. This spend had increased by an annual average of 1.4% per person from 2011–12 to 2015–16. The total expenditure in 2015–16 includes:

- about \$5.4 billion, or \$227 per person, spent on state and territory specialised mental health services (including \$2.4 billion on public hospital services for admitted patients and \$2.0 billion on community mental health care)
- about \$1.1 billion, or \$47 per person, spent on Medicare-subsidised services. This spending increased by an annual average of 3.9% per person over the 5 years to 2015–16
- about \$564 million, or \$24 per person, spent on mental health-related prescriptions subsidised under the Pharmaceutical Benefits Scheme and Repatriation Pharmaceutical Benefits Scheme, mostly to subsidise antipsychotic (50%) and antidepressant (37%) drugs.

## Workforce

A variety of professionals deliver care and support to people with mental illness, including psychologists, psychiatrists, mental health nurses, GPs, social workers, counsellors and peer workers. Available workforce data for some of these professions, show that in 2015:

- there were about 24,500 registered psychologists, 21,000 mental health nurses and 3,100 psychiatrists in Australia
- about 31% of mental health nurses were men, while around 10% of the general nursing workforce were men
- about 62% of psychiatrists were men, while around 70% of all medical specialists were men. About 22% of psychologists were men
- about 32% of mental health nurses and 44% of psychiatrists were aged 55 and over. The age profile of registered psychologists was younger, with 72% aged under 55.

In 2015–16, there were about 32,000 full-time equivalent (FTE) staff employed in state and territory specialised mental health care services. Nationally, this equates to 133 FTE staff per 100,000 population. In the same period, there were about 3,300 FTE staff employed in private hospital specialised mental health services, equating to 14 FTE staff employed per 100,000 population.

## Safety and quality of mental health services

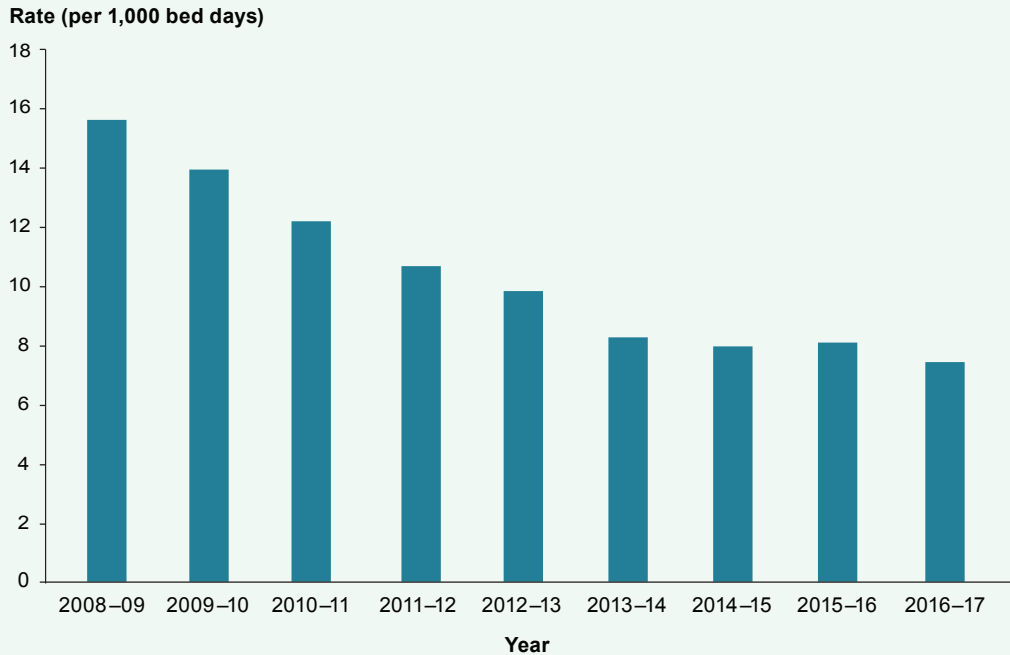
In Australia, there has been a sustained effort to minimise the use of restrictive practices in mental health care settings, such as seclusion and restraint. The National Mental Health Commission's Position Statement on seclusion and restraint in mental health calls for leadership across a range of priorities, including 'national monitoring and reporting on seclusion and restraint across jurisdictions and services' (NMHC 2015).

### Seclusion events in mental health care settings

Seclusion is defined as the confinement of a patient at any time of the day or night alone in a room or area from which free exit is prevented. Reducing and, where possible, eliminating the use of seclusion is a policy priority in Australian mental health care and has been supported by changes to legislation, policy and clinical practice.

Public reporting enables services to review their individual results against state and territory and national rates and like services, thereby supporting service reform and quality improvement agendas. The national data show a substantial reduction in the use of seclusion within specialised acute public hospital mental health services since the AIHW's first reported restrictive practice data in 2008–09. There was an average annual decrease of 8.9% from 2008–09 to 2016–17 (Figure 7.20.1).

Figure 7.20.1: Rate of seclusion events, public sector acute mental health hospital services, 2008–09 to 2016–17



Source: National Seclusion and Restraint Database; Table S7.20.1.

## What is missing from the picture?

From 1 July 2016, the role of Primary Health Networks has included responsibility for leading mental health planning and integration with states and territories; non-government organisations; National Disability Insurance Scheme (NDIS) providers; the private sector; and Indigenous, drug and alcohol and other related services and organisations. Data on the activity of Primary Health Networks—collected under the Department of Health’s Primary Mental Health Care Minimum Data Set—are anticipated to be available for reporting in 2018–19.

People with psychiatric disability who have substantial and permanent functional impairment are eligible to access funding through the NDIS. As well, for people with disability other than psychiatric disability, funding may also be provided for mental health-related services and support if required. Data on the supports accessed under the NDIS by people with psychiatric disability are not currently available for reporting.

The Bettering the Evaluation and Care of Health (BEACH) surveys provided data for the AIHW to report on mental health-related services provided by GPs. The 2015–16 BEACH data collection was the last to be conducted (see Chapter 7.5 'Primary health care'). This leaves the Medicare Benefits Schedule (MBS) items as the only source of data on mental health-related services provided by GPs. Not all mental health-related GP encounters are billed using mental health-specific MBS items—so these items are an underestimate of total mental health-related GP activity.

There are no nationally consistent data on the workforce or activities of mental health non-government organisations (NGOs) to inform policy, practice and planning of their activities. This is a notable data gap as NGOs play an important role in providing non-clinical mental health-related services to people living with mental illness, their families and carers.

## Where do I go for more information?

More information on mental health services and on restrictive practices in mental health services is available in the *Mental Health Services in Australia* report.

If you or someone you know needs help please call:

**Lifeline 13 11 14**

**beyondblue 1300 22 4636**

**Kids Helpline 1800 55 1800**

## Reference

NMHC (National Mental Health Commission) 2015. Position statement on seclusion and restraint in mental health. Sydney: NMHC.

## 7.21 Palliative care services

Palliative care aims to relieve suffering and improve the quality of life for people with a life threatening condition and their families (WHO 2016).

Palliative care is delivered by various government agencies in all jurisdictions in Australia, as well as by private and not-for-profit bodies. It is provided in almost all health care settings, including neonatal units, paediatric services, general practices, acute hospitals, residential and community aged care services, and generalist community services. Specialist palliative care services operate from professional inpatient services, hospices and community-based specialist services (Department of Health and Ageing 2010).

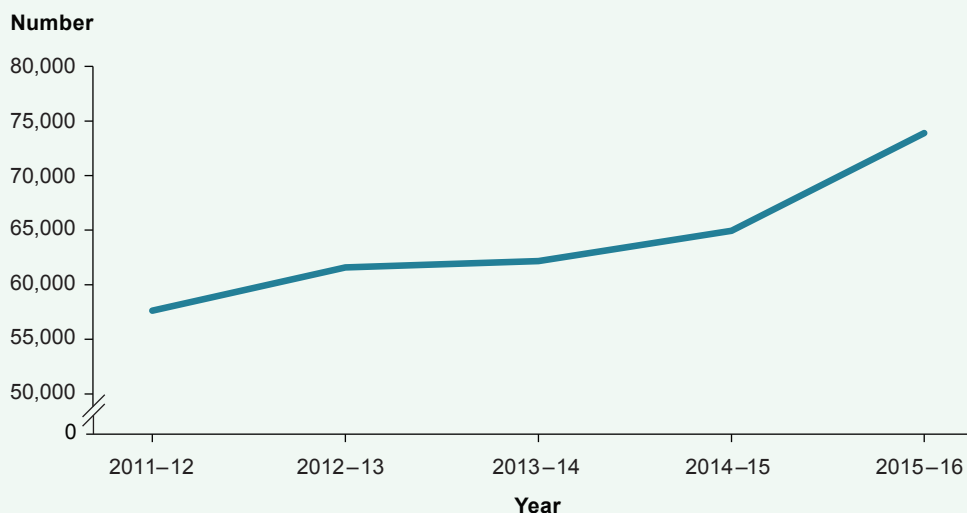
The demand for palliative care services is likely to increase in Australia in future years due to a growing and ageing population as well as to the high burden of disease, related to the higher prevalence of cancer and other chronic conditions, in older age groups.

### Palliative care in hospitals

A person may receive palliative care as an admitted patient in hospital and may require one or more hospitalisations while receiving this care. A subset of these patients will die in hospital. Admitted patient data in public and private hospitals show that:

- from 2011–12 to 2015–16, palliative care-related hospitalisations increased by 28% to almost 74,000 (Figure 7.21.1), compared with an increase of 15% of all hospitalisations over the same period
- half (51%) of all admitted patients who died in hospital had received palliative care in 2015–16
- almost half (48%) of palliative care-related hospitalisations recorded a principal diagnosis of cancer in 2015–16.

**Figure 7.21.1: Palliative care hospitalisations, 2011–12 to 2015–16**



Source: National Hospital Morbidity Database; Table S7.21.1.

# Medications for palliative care treatment

The use of prescription medications is an important part of palliative care. One of the attributes of this type of care is to 'provide relief from pain and other distressing symptoms' (WHO 2014). In the majority of cases, this involves medications being prescribed by the treating clinician.

- Over the 5 years from 2011–12 to 2015–16, the rate of subsidised palliative care-related prescriptions increased at an average annual rate of 17% nationally.
- In 2015–16, there were more than 83,000 palliative care-related prescriptions provided to almost 52,500 patients.
- The majority (90%) of palliative care-related medications were prescribed by a general practitioner; other medical specialists prescribed 7.7%, and palliative medicine specialists prescribed 2.4% in 2015–16.
- In 2015–16, \$4.4 million dollars was spent in benefits for medications included on the palliative care schedule (an average of \$118 per patient). The average cost per patient ranged from \$80 in Victoria to \$265 per patient in the Australian Capital Territory.

## Workforce

The palliative care workforce is made up of a number of professional groups, including specialist palliative medicine physicians, nurses, general practitioners, pharmacists, other medical specialists (such as oncologists and geriatricians), as well as other health workers, support staff and volunteers.

Nationally, in 2015, there were about 210 specialist palliative medicine physicians and more than 3,300 palliative care nurses. About 3 in 5 (62%) doctors employed as a specialist palliative medicine physician were women, which is more than double the female proportion of all employed medical specialists (30%).

### What is missing from the picture?

The fragmented and incomplete nature of palliative care data is well recognised and one of the challenges is identifying these activities across different health and social care settings. The AIHW is involved in current national data development activities aimed at addressing some of the recognised data gaps in the palliative care space.

### Where do I go for more information?

More information on palliative care in Australia can be found at <[www.aihw.gov.au](http://www.aihw.gov.au)>. Recent publications, including [Palliative care services in Australia](#), are available for free download.

More information on the Pharmaceutical Benefits Scheme is available at <[www.pbs.gov.au](http://www.pbs.gov.au)>.

## References

Department of Health and Ageing 2010. Supporting Australians to live well at the end of life: National Palliative Care Strategy 2010. Canberra: Department of Health and Ageing.

WHO (World Health Organization) 2014. Global atlas of palliative care at the end of life. Geneva: WHO.

WHO 2016. WHO definition of palliative care. Geneva: WHO. Viewed 16 November 2015, <<http://www.who.int/cancer/palliative/definition/en/>>.

**Methods and conventions**

**Symbols**

**Acronyms and abbreviations**

**Glossary**

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# Methods and conventions

## Age standardisation

This is a method of removing the influence of age when comparing populations with different age structures—either for different populations at the same time, or for the same population at different times. It is based on the use of standard population, which in this report is the Australian estimated resident population as at 30 June 2001 (Table A1).

This report uses direct age standardisation, which is generally used when there are large populations under study and the age-specific rates are reliable. Direct age-standardised rates are presented for most incidence, prevalence, hospitalisations and deaths data.

## Calculating direct age-standardised rates

There are 3 steps to calculate direct age-standardised rates:

Step 1: Calculate the age-specific rate for each age group.

Step 2: Multiply the age-specific rate by the corresponding standard population for each age group for the expected number of cases in each age group.

Step 3: Sum the expected number of cases in each age group and divide this sum by the total of the standard population to give the age-standardised rate.



**Table A1: Standard population for use in age standardisation, Australia, 30 June 2001**

Age group	Population
0	253,031
1-4	1,029,326
5-9	1,351,664
10-14	1,353,177
15-19	1,352,745
20-24	1,302,412
25-29	1,407,081
30-34	1,466,615
35-39	1,492,204
40-44	1,479,257
45-49	1,358,594
50-54	1,300,777
55-59	1,008,799
60-64	822,024
65-69	682,513
70-74	638,380
75-79	519,356
80-84	330,050
85 and over	265,235
<b>Total</b>	<b>19,413,240</b>

Source: ABS 2003.

## Average annual rates of change

Average annual rates of change or growth rates have been calculated as geometric rates:

$$\text{Average rate of change} = \left( \left( \frac{P_n}{P_o} \right)^{\frac{1}{N}} - 1 \right) \times 100$$

where  $P_n$  = value in later time period

$P_o$  = value in earlier time period

$N$  = number of years between the two time periods.

## Classifications used

The classification of deaths follows the 10th revision of the International Classification of Diseases (WHO 2011). Diseases treated in hospitals are classified using the International statistical classification of diseases and related health problems, 10th revision, Australian Modification (ICD-10-AM), of which the 10th edition is the latest version (ACCD 2016). The procedures performed during a hospital stay are classified using the Australian Classification of Health Interventions.

## Data subject to revision

This report draws data from a range of administrative and survey data sets, all of which are subject to change. Such changes may arise from:

- the nature and timing of the data collection—for example, notifiable diseases are based on a 'real-time' collection of reported cases, and the counts and rates could change daily
- a regular program of updates and maintenance—for example, for 2007 data onwards, the Australian Bureau of Statistics (ABS) revises cause-of-death data using information pertaining to coroners' cases that was not available at the time of original processing
- newly discovered errors or anomalies.

The latest version of a data set has been used wherever possible. In cases where the data change frequently, the date of the release is noted. Revisions and changes in coverage should be considered when interpreting changes over time.

Note: Cause of Death Unit Record File data are provided to the AIHW by the Registries of Births, Deaths and Marriages and the National Coronial Information System (managed by the Victorian Department of Justice) and include cause of death coded by the ABS. The data are maintained by the AIHW in the National Mortality Database.

## Quality assurance

The report content was largely prepared by AIHW staff, and was subject to rigorous internal review and clearance processes. Additional external peer reviewers were used to validate and strengthen the content of the report.

## Data sources

The best available information has been used to inform the report, drawn from a range of data sources that are referenced throughout the report. Most of the data sources are national collections managed by the AIHW and the ABS. These are supplemented by other data collections, as appropriate.

Each of the data sources used in the report has strengths and limitations that affect how the data can be used and what can be inferred from the results. The AIHW takes great care to ensure that data used are correct and that the conclusions drawn are robust.

Although this report is published in 2018, some of the statistics refer to 2014–15 or earlier. This is because some data, such as population-based surveys, are collected every 3–5 years or even less often. Also, it can often take some time before data are fully processed and provided to the AIHW. Finally, the AIHW often needs time to analyse the data and ensure the statistics are accurate and of high quality.

Given the comprehensive nature of this report, and the time it takes to prepare a compendium report of this scale, it is possible that some other reports may be released by the AIHW or others with more recent data. Readers are referred to the latest releases in the 'Where do I go for more information?' sections of articles and snapshots.

## Effects of rounding

Entries in columns and rows of tables may not add to the totals shown, because of rounding. Unless otherwise stated, derived values are calculated using unrounded numbers.

## Dates and time spans

Periods based on full calendar years (1 January to 31 December) are written as, for example, 2018 for 1 year. When there are 2 or more calendar years in the period, the first and final years are written in full. For example, 2017–2018 is a 2 calendar-year span and 2016–2018 covers 3 calendar years.

Periods based on financial years (1 July to 30 June) are written with a second number which is abbreviated: for example, 2017–18 for 1 financial year, 2016–18 for 2 and 2015–18 for 3. A longer span of financial years is written as 'In the 10 years from 2008–09 to 2017–18...'

Some surveys may be based on other 12-month spans—for example, the general practice Bettering the Evaluation of Care and Health (BEACH) survey is based on collection periods from 1 April to 30 March. These are presented as for financial years; for example, 2017–18 would be a 'year' or 12-month period.

## Use of icons

Icons and infographics are visual representations of data that are intended to present complex information quickly and clearly. Generally, these graphics simplify information so it can be easily understood and, as such, carry a risk of generalising or stereotyping. This is not the intention of the AIHW, which endeavours to use icons only to improve the clarity and accessibility of information.

# Use of italics

Italics are used in this report:

- for remoteness categories derived using the Australian Statistical Geography Standard. The main categories are *Major cities*, *Inner regional*, *Outer regional*, *Remote* and *Very remote*
- for publication titles
- to indicate terms that are part of a formal medical category/classification scheme. For example, triage categories: *Emergency*, *Urgent*, *Semi-urgent* and *Resuscitation*.

## References

ABS (Australian Bureau of Statistics) 2003. Australian demographic statistics, September quarter 2002. ABS cat. no. 31010.0. Canberra: ABS.

ACCD (Australian Consortium for Classification Development) 2016. International statistical classification of diseases and related health problems, tenth revision, Australian Modification. Tenth edition. Adelaide: Independent Hospital Pricing Authority.

WHO (World Health Organization) 2011. International statistical classification of diseases and related health problems, tenth revision. Fifth edition 2016. Geneva: WHO.

# Symbols

\$	Australian dollars, unless otherwise specified
%	per cent
<	less than
>	more than
≤	less than or equal to
≥	more than or equal to
*	estimate has a relative standard error of 25% to 50% and should be used with caution
#	statistically significant finding—see individual usage for details on how significance was derived
..	no data/insufficient data
'000	thousands
m	metre
mg	milligram
kg	kilogram
nmol/L	nanomoles per litre
n.a.	not available

# Acronyms and abbreviations

AATSIHS	Australian Aboriginal and Torres Strait Islander Health Survey
ABDS	Australian Burden of Disease Study
ABS	Australian Bureau of Statistics
ACCHO	Aboriginal Community Controlled Health Organisation
ACT	Australian Capital Territory
ADF	Australian Defence Force
AHPEQS	Australian Hospital Patient Experience Question Set
AHPF	Australian Health Performance Framework
AHPRA	Australian Health Practitioner Regulation Authority
AHS	Australian Health Survey
AIDS	acquired immune deficiency syndrome
AIHW	Australian Institute of Health and Welfare
AMR	Australian Mesothelioma Registry
AODTS NMDS	Alcohol and Other Drug Treatment Services National Minimum Data Set
ASGC	Australian Standard Geographical Classification
ASGS	Australian Statistical Geography Standard
ATC	Anatomical Therapeutic Chemical
bDMARDs	biological disease-modifying anti-rheumatic drugs
BEACH	Bettering the Evaluation and Care of Health
BMI	body mass index
CALD	culturally and linguistically diverse
CDI	<i>Clostridium difficile</i> infections
CHD	coronary heart disease
CI	confidence interval
CKD	chronic kidney disease
COAG	Council of Australian Governments
COPD	chronic obstructive pulmonary disease
CRP	Cardiac Rehabilitation Program
DALY	disability-adjusted life year
DDD	Defined Daily Doses
DSRS	deseal/reseal
DPP4	dipeptidyl peptidase 4
DVA	Department of Veterans' Affairs

ENT	ear, nose and throat
EPC	Enhanced Primary Care
ERP	estimated resident population
ESKD	end-stage kidney disease
FDSV	family, domestic and sexual violence
FTE	full-time equivalent
GDP	gross domestic product
GHG	greenhouse gas
GIRS	Geographically-adjusted Index of Relative Supply
GP	general practitioner
GRIM books	General Incidence of Mortality books
HAC	hospital acquired complication
HALE	health-adjusted life expectancy
HIV	human immunodeficiency virus
HPV	Human Papillomavirus
HSD	Highly Specialised Drugs
ICD	International Classification of Diseases
ICD-10	International Statistical Classification of Diseases and Related Health Problems, Tenth revision
ICD-10-AM	International Statistical Classification of Diseases and Related Health Problems, Tenth revision, Australian Modification
ICD-11	International Statistical Classification of Diseases and Related Health Problems, Eleventh revision
ICHOM	International Consortium for Health Outcomes Measurement
ICPC-2	International Classification for Primary Care, Version 2
iFOBT	immunochemical faecal occult blood test
IMD	invasive meningococcal disease
IRSD	Index of Relative Socio-Economic Disadvantage
ISPHCS	Indigenous-specific primary health care services
IVF	in-vitro fertilisation
K10	Kessler Psychological Distress Scale
KRT	kidney replacement therapy
LGBTI	lesbian, gay, bisexual, transgender or intersex
LHN	Local Hospital Network
MCIS	Mortality and Cancer Incidence Study
MDMA	3,4-methylenedioxymethamphetamine

MORT books	Mortality Over Regions and Time books
MRSA	methicillin-resistant <i>Staphylococcus aureus</i>
MSSA	methicillin-sensitive <i>Staphylococcus aureus</i>
NATSIHS	National Aboriginal and Torres Strait Islander Health Survey
NBCSP	National Bowel Cancer Screening Program
NCMCC	National Centre for Monitoring Chronic Conditions
NCMI	National Core Maternity Indicators
NCSP	National Cervical Screening Program
NDIS	National Disability Insurance Scheme
NDSHS	National Drug Strategy Household Survey
NGO	non-government organisation
NHMD	National Hospital Morbidity Database
NHPF	National Health Performance Framework
NHS	National Health Survey
NHWDS	National Health Workforce Data Set
NICU	neonatal intensive care unit
NIRA	National Indigenous Reform Agreement
NNAPEDCD	National Non-Admitted Patient Emergency Department Care Database
NNDSS	National Notifiable Diseases Surveillance System
NOPSAD	National Opioid Pharmacotherapy Statistics Annual Data
NPHDC	National Prisoner Health and Data Collection
NSPS	National Suicide Prevention Strategy
NSW	New South Wales
NT	Northern Territory
NTER	Northern Territory Emergency Response
NTRAI HHP	Northern Territory Remote Aboriginal Investment Hearing Health Program
NWDMP	National Wastewater Drug Monitoring Program
OECD	Organisation for Economic Co-operation and Development
OME	otitis media with effusion
OR	odds ratio
OST	opioid substitution therapy
PBS	Pharmaceutical Benefits Scheme
PCOC	Palliative Care Outcomes Collaboration
PES	Patient Experience Survey
PHN	Primary Health Network



PMKeyS	Personnel Management Key Solution
PPH	potentially preventable hospitalisation
PREM	patient-reported experience measure
PrEP	Pre-exposure prophylaxis for HIV prevention
PROM	patient reported outcome measure
PTSD	post-traumatic stress disorder
Qld	Queensland
RFDS	Royal Flying Doctor Service
RoGS	Report on Government Services
RPBS	Repatriation Pharmaceutical Benefits Scheme
s85	Section 85 of the <i>National Health Act 1953</i> (Cwlth)
s100	Section 100 of the <i>National Health Act 1953</i> (Cwlth)
SA	South Australia
SA2	Statistical Area level 2
SA3	Statistical Area level 3
SAB	<i>Staphylococcus aureus</i> bacteraemia
SCN	special care nursery
SDAC	Survey of Disability, Ageing and Carers
SEIFA	Socio-Economic Indexes for Areas
SF-36	Short Form-36
SHA	System of Health Accounts
SIDS	sudden infant death syndrome
UNHCR	United Nations High Commissioner for Refugees
UV	ultraviolet
VBAC	vaginal birth after caesarean section
Vic	Victoria
WA	Western Australia
WHO	World Health Organization
WHOQoL-BREF	World Health Organization Quality of Life Instrument
YES	Your Experience of Service
YLD	years lived with disability
YLL	years of life lost

# Glossary

**Aboriginal and Torres Strait Islander health practitioner:** A person who has completed a Certificate IV in Aboriginal and/or Torres Strait Islander Primary Health Care (Practice) and is registered with the Aboriginal and Torres Strait Islander Health Practice Board of Australia. The practitioner may undertake higher levels of clinical assessment and care within their agreed scope of practice. This role became nationally registered from 1 July 2013 under the National Registration and Accreditation Scheme for health professions.

**Aboriginal and Torres Strait Islander health worker:** An Aboriginal and/or Torres Strait Islander with a minimum qualification in the field of primary health care work or clinical practice. This includes **Aboriginal and Torres Strait Islander health practitioners** who are one speciality stream of health worker. Health workers liaise with patients, clients and visitors to hospitals and health clinics, and work as a team member to arrange, coordinate and deliver health care in community health clinics.

**Aboriginal or Torres Strait Islander:** A person of Aboriginal and/or Torres Strait Islander descent who identifies as an Aboriginal and/or Torres Strait Islander. See also **Indigenous**.

**abnormal blood lipid levels:** Abnormal levels of fats in the blood, such as cholesterol or **triglycerides**. Here it has been defined as total cholesterol  $\geq 5.5$  mmol/L, LDL cholesterol  $\geq 3.5$  mmol/L, HDL cholesterol  $< 1.0$  mmol/L in men or  $< 1.3$  mmol/L in women, triglycerides  $\geq 2$  mmol/L, or use of lipid-modifying medication.

**absolute cardiovascular disease risk:** A measure of the overall risk of cardiovascular disease rather than considering individual risk factors, such as cholesterol or blood pressure, in isolation.

**abstainer (alcohol):** A person who has not consumed a full serve of alcohol in the previous 12 months.

**accelerated ageing:** A process where a particular population, such as prisoners, show the level of health and signs of ageing at a younger age than another population, such as the general population.

**Accessibility/Remoteness Index of Australia:** Classifies the level of accessibility to goods and services (such as to general practitioners, hospitals and specialist care) based on proximity to these services (measured by road distance).

**acquired immune deficiency syndrome (AIDS):** A syndrome caused by the **human immunodeficiency virus (HIV)**. If HIV is untreated, the body's immune system is damaged and is unable to fight infections and cancer.

**acute:** A term used to describe something that comes on sharply and is often brief, intense and severe.

**acute care:** Care provided to patients admitted to hospital that is intended to cure illness, alleviate symptoms of illness or manage childbirth.

**acute otitis media:** The general term for acute otitis media both with and without perforation. It is the presence of fluid behind the eardrum and at least one of the following: bulging eardrum, red eardrum, recent discharge of pus, fever, ear pain or irritability. A bulging eardrum, recent discharge of pus and ear pain are the most reliable indicators of acute otitis media.

**additional diagnosis:** The diagnosis of a condition or recording of a complaint—either coexisting with the principal diagnosis or arising during the episode of admitted patient care (**hospitalisation**), episode of residential care or attendance at a health care establishment—that requires the provision of care. Multiple diagnoses may be recorded.

**ADF personnel:** Serving and ex-serving members of the Australian Defence Force; civilian personnel employed by the Department of Defence are excluded.

**admission:** An admission to hospital. In this report, the term **hospitalisation** is used to describe an episode of hospital care that starts with the formal admission process and ends with the formal **separation** process. The number of separations has been taken as the number of admissions; hence, the admission rate is the same as the separation rate.

**admitted patient:** A patient who undergoes a hospital's formal **admission** process.

**adverse event:** An incident involving harm to a person receiving health care. It includes infections, falls and other injuries, as well as reactions or complications due to surgery and other procedures, medical devices or medication—some of which may be preventable. Adverse events in health care can occur inside or outside hospitals and can be the cause of hospitalisation as well. The rate of adverse events treated in hospital is used as an indicator of safety in Australia's health system.

**age-specific rate:** A rate for a specific age group. The numerator and denominator relate to the same age group.

**age standardisation:** A way to remove the influence of age when comparing populations with different **age structures**. This is usually necessary because the rates of many diseases vary strongly (usually increasing) with age. The age structures of the different populations are converted to the same 'standard' structure, and then the disease rates that would have occurred with that structure are calculated and compared.

**age structure:** The relative number of people in each age group in a population.

**air pollutants:** Pollutants that include ozone (O<sup>3</sup>), nitrogen dioxide (NO<sup>2</sup>), particulate matter (PM<sub>10</sub> or 2.5), carbon monoxide (CO), sulfur dioxide (SO<sup>2</sup>) and biological allergens.

**all ranks other than commissioned officer:** A Defence member who holds a Sailor, Other Ranks or Airman/Airwoman rank.

**allergic rhinitis:** A bodily response triggered by an allergic reaction. The symptoms may include a runny or blocked nose and/or sneezing and watery eyes. Also known as 'hay fever'.

**allied health professional:** A health professional who is not a doctor, nurse or dentist. Allied health professionals include (but are not limited to) Aboriginal and Torres Strait Islander health practitioners, chiropractors, occupational therapists, optometrists, osteopaths, pharmacists, physiotherapists, podiatrists, psychologists, sonographers and speech pathologists.

**Alzheimer disease:** A condition marked by progressive loss of brain function, shown by worsening short-term memory, confusion and disorientation. A common form of **dementia**.

**angina:** Temporary chest pain or discomfort when the heart's own blood supply is inadequate to meet extra needs, as in exercise.

**anorexia nervosa:** A type of eating disorder characterised by the persistent restriction of food and water intake, intense fear of gaining weight and disturbance in self-perceived weight or shape.

**antenatal:** The period covering conception up to the time of birth. Synonymous with prenatal.

**antenatal care:** A planned visit between a pregnant woman and a midwife or doctor to assess and improve the wellbeing of the mother and baby throughout pregnancy. It does not include visits where the sole purpose is to confirm the pregnancy. Also known as an antenatal visit.

**anxiety disorders:** A group of mental disorders marked by excessive feelings of apprehension, worry, nervousness and stress. Includes generalised anxiety disorder, obsessive-compulsive disorder, panic disorder, **post-traumatic stress disorder** and various phobias.

**Apgar score:** Numerical score used to indicate a baby's condition at 1 minute and at 5 minutes after birth. Between 0 and 2 points are given for each of 5 characteristics: breathing, colour, heart rate, muscle tone and reflex irritability. The total score is between 0 and 10.

**arthritis:** A group of disorders for which there is **inflammation** of the joints—which can then become stiff, painful, swollen or deformed. The two main types of arthritis are **osteoarthritis** and **rheumatoid arthritis**.

**asbestos:** A group of naturally occurring fibrous minerals that do not readily break down.

**associated cause(s) of death:** A cause(s) listed on the Medical Certificate of Cause of Death, other than the **underlying cause of death**. They include the immediate cause, any intervening causes, and conditions that contributed to the death but were not related to the disease or condition causing death. See also **cause of death**.

**asthma:** A common, chronic inflammatory disease of the air passages that presents as episodes of wheezing, breathlessness and chest tightness due to widespread narrowing of the airways and obstruction of airflow.

**asthma-COPD overlap:** A condition where adults have features of both asthma and **chronic obstructive pulmonary disease (COPD)**.

**atrial fibrillation:** An uneven and fast heartbeat.

**attributable burden:** The amount of burden that could be avoided if the risk factor were removed.

**augmentation of labour:** Intervention after the spontaneous onset of labour to help its progress.

**Australian Standard Geographical Classification (ASGC):** Common framework defined by the Australian Bureau of Statistics for collecting and disseminating geographically classified statistics. The framework was implemented in 1984 and its final release was in 2011. It has been replaced by the **Australian Statistical Geography Standard (ASGS)**.

**Australian Statistical Geography Standard (ASGS):** Common framework defined by the Australian Bureau of Statistics for collecting and disseminating geographically classified statistics. It replaced the **Australian Standard Geographical Classification (ASGC)** in July 2011.

**average length of stay:** The average number of **patient days** for **admitted patient** episodes. Patients who have an **admission** and a **separation** on the same date are allocated a length of stay of 1 day.

**avoidable deaths:** See **potentially avoidable deaths**.

**back pain and problems:** A range of conditions related to the bones, joints, connective tissue, muscles and nerves of the back. Back problems are a substantial cause of disability and lost productivity.

**benefit-paid pharmaceuticals:** Pharmaceuticals listed in the schedule of the **Pharmaceutical Benefits Scheme (PBS)** and the Repatriation Pharmaceutical Benefits **Scheme (RPBS)** for which pharmaceutical benefits have been paid or are payable. Does not include listed pharmaceutical items where the full cost is met from the patient co-payment under the PBS or RPBS.

**binge drinking:** The consumption of an excessive amount of alcohol in a short period of time.

**binge eating disorder:** An eating disorder characterised by repeated episodes of binge eating. Binge eating means eating large amounts of food in a short period of time, often accompanied by a feeling of loss of control or an inability to stop eating.

**birthweight:** The first weight of a baby (stillborn or live born) obtained after birth (usually measured to the nearest 5 grams and obtained within 1 hour).

**blood cholesterol:** Fatty substance produced by the liver and carried by the blood to supply the rest of the body. Its natural function is to supply material for cell walls and for steroid hormones, but if levels in the blood become too high this can lead to atherosclerosis (a disease in which plaque builds up inside the arteries) and heart disease.

**blood pressure:** The force exerted by the blood on the walls of the arteries as it is pumped around the body by the heart. It is written, for example, as 134/70 mmHg, where the upper number is the systolic pressure (the maximum force against the arteries as the heart muscle contracts to pump the blood out) and the lower number is the diastolic pressure (the minimum force against the arteries as the heart relaxes and fills again with blood). Levels of blood pressure can vary greatly from person to person and from moment to moment in the same person. See also **high blood pressure/hypertension**.

**body mass index (BMI):** The most commonly used method of assessing whether a person is normal weight, underweight, overweight or obese (see **obesity**). It is calculated by dividing the person's weight (in kilograms) by their height (in metres) squared—that is,  $\text{kg} \div \text{m}^2$ . For both men and women, underweight is a BMI below 18.5, acceptable weight is from 18.5 to less than 25, overweight but not obese is from 25 to less than 30, and obese is 30 and over. Sometimes overweight and obese are combined—defined as a BMI of 25 and over.

**breech presentation:** A fetal presentation where a baby's buttocks are at the opening of the uterus. In a frank breech, the legs are straight up in front of the body. In a complete breech the legs are folded, but the feet are above the buttocks. In an incomplete breech, the feet are below the buttocks.

**bronchiectasis:** An abnormal widening of the lungs' air passages (bronchi). This allows infections to develop and leads to coughing with pus and sometimes blood. It has several causes, including **cystic fibrosis**; reduced immune functioning; and infections such as tuberculosis, **whooping cough (pertussis)** and **measles**.

**bronchitis:** Inflammation of the main air passages (bronchi). May be **acute** or **chronic**.

**built environment:** The human-made surroundings that provide the setting for people to live, work and recreate. It incorporates the building and transportation design of a setting, including elements such as open green spaces, bike ways/footpaths, shopping centres, business complexes and residential accommodation, together with their supporting infrastructure (such as transport, water and energy networks).

**bulimia nervosa:** A type of eating disorder characterised by repeated binge eating episodes followed by compensatory behaviours. Binge eating episodes involve eating large amounts of food in a short period of time accompanied by feeling a loss of control or inability to stop eating. Compensatory behaviours include self-induced vomiting, laxative or diuretic misuse, fasting, excessive exercise or the inappropriate use of any drugs for weight control (that is, drugs that have not been prescribed to the individual for weight control).

**bulk-billing:** The process where a medical practitioner or optometrist sends the bill for services directly to Medicare, so the patient pays nothing. Also known as direct billing.

**burden of disease and injury:** A term referring to the quantified impact of a disease or injury on an individual or population, using the **disability-adjusted life year (DALY)** measure.

**caesarean birth (also caesarean section or C-section):** A method of birth where a surgical incision is made in the mother's uterus via the abdomen to directly remove the baby.

**Campylobacteriosis:** A disease caused by *Campylobacter* bacteria. It is one of the most common causes of gastroenteritis in Australia and is a **notifiable disease**.

**cancer (malignant neoplasm):** A large range of diseases where some of the body's cells become defective, begin to multiply out of control, invade and damage the area around them, and can then spread to other parts of the body to cause further damage.

**cancer incidence:** The number or rate of new cases of cancer diagnosed in a population during a given time period.

**capital expenditure:** Spending on large-scale fixed assets (for example, new buildings and equipment) with a useful life extending over several years.

**cardiomyopathy:** A condition where there is direct and widespread damage to the heart muscle, weakening it. It can be due to various causes, such as viral infections and severe alcohol abuse. It can lead to an enlarged, thickened and dilated heart as well as **heart failure**.

**cardiovascular disease/condition:** Any disease of the circulatory system, namely the heart (cardio) or blood vessels (vascular). Includes **angina, heart attack, stroke** and peripheral vascular disease. Also known as **circulatory disease**.

**caries:** Bacterial disease that causes the demineralisation and decay of teeth and can involve inflammation of the central dental pulp.

**case-fatality:** The proportion of people with a disease or medical condition who die within a specified time period.

**casemix:** The range and types of patients (the mix of cases) treated by a hospital or other health service. Casemix classifications (such as Australian Refined Diagnosis Related Groups) provide a way to describe and compare hospitals and other services for management purposes.

**cause(s) of death:** All diseases, morbid conditions or injuries that either resulted in or contributed to death—and the circumstances of the accident or violence that produced any such injuries—that are entered on the Medical Certificate of Cause of Death. Causes of death are commonly reported by the **underlying cause of death**. See also **associated cause(s) of death** and **multiple causes of death**.

**cerebrovascular disease:** Any disorder of the blood vessels supplying the brain or its covering membranes. A notable and major form of cerebrovascular disease is **stroke**.

**child:** A person aged 0–14 unless otherwise stated.

**child mortality rate:** The number of deaths in a given period among children aged 0–14 per 100,000 children of the same age. Can also be presented for specific age groups within this age range, such as for children aged 0–4 which is also called the **under-five mortality rate**.

**chlamydia:** The most common sexually transmissible infection in Australia, caused by *Chlamydia trachomatis* bacteria. It is treatable and may not cause symptoms; however, it can lead to serious illness if untreated. It is a **notifiable disease**.

**cholesterol:** See **blood cholesterol**.

**chronic:** A term describing something that is persistent and long lasting.

**chronic diseases/conditions:** A diverse group of diseases/conditions, such as heart disease, cancer and arthritis, which tend to be long lasting and persistent in their symptoms or development. Although these features also apply to some **communicable diseases** (infectious diseases), the term is usually confined to non-communicable diseases.

**chronic kidney disease (CKD):** A term that refers to all conditions of the kidney, lasting at least 3 months, where a person has had evidence of kidney damage and/or reduced kidney function, regardless of the specific cause.

**chronic obstructive pulmonary disease (COPD):** Serious, progressive and disabling long-term lung disease where damage to the lungs (usually because of both **emphysema** and chronic **bronchitis**) obstructs oxygen intake and causes increasing shortness of breath. By far the greatest cause of COPD is cigarette smoking.

**chronic sinusitis:** The inflammation of the lining of one or more sinuses (large air cavities inside the face bones). It occurs when normal draining of the sinuses is obstructed by swelling, excessive mucus or an abnormality in the structure of the sinuses.

**chronic suppurative otitis media with discharge:** A persistent suppurative (see **suppurative**) discharge for more than 6 weeks from the middle ear through a perforation in the tympanic membrane (eardrum). Importantly, the diagnosis of this condition is appropriate only if the perforation is seen and is large enough to allow the discharge to flow out of the middle ear space.

**chronic suppurative otitis media without discharge:** A perforation (hole) in the tympanic membrane (eardrum) without evidence of discharge or fluid behind the eardrum. It is also known as 'inactive chronic suppurative otitis media' and 'dry perforation'.

**circulatory disease:** Alternative name for **cardiovascular disease**.

**clinical urgency category:** A category in which a patient on the public hospital waiting list for surgery is placed after a clinical assessment of urgency. The categories are as follows: *Category 1*—procedures that are clinically indicated within 30 days; *Category 2*—procedures that are clinically indicated within 90 days; *Category 3*—procedures that are clinically indicated within 365 days.

**closed treatment episode:** A period of contact between a client and a treatment provider, or team of providers. An episode is closed when treatment is completed, when there has been no further contact between the client and the treatment provider for 3 months, or when treatment has stopped.

***Clostridium difficile* infection:** A gastrointestinal infection that commonly affects hospitalised patients and people in a community.

**cohort:** A group of people who share a similar characteristic (for example, age).

**collective burden:** The sum of the **direct burden** and the **indirect burden**.

**colorectal (bowel) cancer:** This disease comprises cancer of the colon, cancer of the rectosigmoid junction and cancer of the rectum (ICD-10 codes C18–C20).

**commissioned officer:** An appointed Defence member who holds a rank of Midshipman or Officer Cadet, or higher.

**communicable disease:** Disease or illness caused by infectious organisms or their toxic products. The disease may be passed directly or indirectly to humans through contact with other humans, animals or other environments where the organism is found.

**community health services:** Non-residential health services offered to patients/clients in an integrated and coordinated manner in a community setting, or the coordination of health services elsewhere in the community. Such services are provided by, or on behalf of, state and territory governments.

**comorbidity:** A situation where a person has two or more health problems at the same time. Also known as **multimorbidity**.

**condition (health condition):** A broad term that can be applied to any health problem, including symptoms, diseases and various risk factors (such as high blood cholesterol, and obesity). Often used synonymously with **disorder**.

**conductive hearing loss:** A deviation of hearing threshold from the normal range associated with reduced conduction of sound through the outer ear, tympanic membrane (eardrum) or middle ear, including the ossicles (middle ear bones).

**confidence interval:** A range determined by variability in data, within which there is a specified (usually 95%) chance that the true value of a calculated parameter lies.

**congenital:** A condition that is recognised at birth, or is believed to have been present since birth, including conditions inherited or caused by environmental factors.

**congenital anomaly:** A structural, functional or metabolic abnormality that is present at birth, even if not diagnosed until months or years later.

**constant prices:** Dollar amounts for different years that are adjusted to reflect the prices in a chosen reference year. This allows spending over time to be compared on an equal dollar-for-dollar basis without the distorting effects of inflation. The comparison will reflect only the changes in the amount of goods and services purchased—changes in the ‘buying power’—not the changes in prices of these goods and services caused by inflation.



**co-payment:** The costs incurred by an individual for payment of a **Pharmaceutical Benefits Scheme (PBS)** or **Repatriation Pharmaceutical Benefits Scheme (RPBS)** medicine.

**core activity:** Term used in discussions of disability that refers to the basic activities of daily living: self-care, mobility and communication.

**core activity limitation:** A limitation where someone needs help with—or is having difficulty in using aids and equipment for—self-care, mobility and/or communication. See also **disability, mild or moderate core activity limitation** and **severe or profound core activity limitation**.

**coronary heart disease:** A disease due to blockages in the heart's own (coronary) arteries, expressed as **angina** or a **heart attack**. Also known as **ischaemic heart disease**.

**course of radiotherapy:** A series of one or more external beam radiotherapy treatments prescribed by a radiation oncologist. A patient can receive more than one course of radiotherapy at the same time (courses that are simultaneous or overlap). One course of radiotherapy may cover multiple phases and multiple treatment plans.

**curative treatment:** A treatment given with the intention of curing disease.

**current prices:** Expenditures reported for a particular year, unadjusted for inflation. Changes in current price expenditures reflect changes in both price and volume.

**cystic fibrosis:** A serious hereditary disease where mucus from glands is too thick and sticky, affecting the lungs and other organs. The person is prone to frequent chest infections, with related problems such as severe **bronchiectasis**, and has a much shortened life expectancy.

**DALY:** See **disability-adjusted life year**.

**data linkage:** The bringing together (linking) of information from two or more different data sources that are believed to relate to the same entity (for example, the same individual or the same institution). This linkage can yield more information about the entity and, in certain cases, provide a time sequence—helping to 'tell a story', show 'pathways' and perhaps unravel cause and effect. The term is used synonymously with 'record linkage' and 'data integration'.

**dementia:** A general term for disorders characterised by worsening mental processes (such as **Alzheimer disease** or vascular dementia). Symptoms include impaired memory, understanding, reasoning and physical functioning.

**dental condition:** Any issue with the teeth or gums that can affect a person's oral health.

**dental services:** Services provided by registered dental practitioners. These include cleft lip and palate services; dental assessment; oral and maxillofacial surgery items; orthodontic, pedodontic and periodontic services; and other dental items listed in the Medical Benefits Schedule. The term covers dental services funded by health funds, state and territory governments and by individuals' out-of-pocket payments.

**dentate:** The term used to describe someone with at least one natural tooth.

**deployment:** Warlike or non-warlike service overseas by members assigned for duty with a United Nations mission or a similar force.

**depression:** A mood disorder with prolonged feelings of being sad, hopeless, low and inadequate, with a loss of interest or pleasure in activities and often with suicidal thoughts or self-blame.

**depressive disorders:** A group of mood disorders with prolonged feelings of being sad, hopeless, low and inadequate, with a loss of interest or pleasure in activities and often with suicidal thoughts or self-blame.

**deseal/reseal (DSRS):** A term used to describe the formal F-111 aircraft fuel tank repair and maintenance programs that required degraded tank sealant (deseal) to be removed and a new sealant (reseal) applied. As well as these formal programs, ad hoc maintenance was undertaken as part of routine tank repairs and maintenance to keep the aircraft operational.

**determinant:** Any factor that can increase the chances of ill health (risk factors) or good health (protective factors) in a population or individual. By convention, services or other programs that aim to improve health are usually not included in this definition.

**diabetes (diabetes mellitus):** A chronic condition where the body cannot properly use its main energy source—the sugar glucose. This is due to a relative or absolute deficiency in insulin, a hormone produced by the pancreas that helps glucose enter the body's cells from the bloodstream and be processed by them. Diabetes is marked by an abnormal build-up of glucose in the blood; it can have serious short- and long-term effects. For the three main types of diabetes, see **type 1 diabetes**, **type 2 diabetes** and **gestational diabetes**.

**diagnostic imaging:** The production of diagnostic images; for example, computed tomography, magnetic resonance imaging, X-rays, ultrasound and nuclear medicine scans.

**dialysis:** An artificial method of removing waste substances from the blood and regulating levels of circulating chemicals—functions usually performed by the kidneys.

**digital health:** The electronic management of health information. This includes using technology to collect and share a person's health information. It can be as simple as a person wearing a device to record how much exercise they do each day, to health care providers sharing clinical notes about an individual.

**direct burden:** The burden calculated in burden of disease analysis to capture the main disabling consequences of the disease. For example, the direct diabetes burden includes diabetic nephropathy, neuropathy and retinopathy.

**disability:** An umbrella term for any or all of the following: an impairment of body structure or function, a limitation in activities, or a restriction in participation. Disability is a multidimensional concept and is considered as an interaction between health conditions and personal and environmental factors. See also **core activity limitation**, **mild or moderate core activity limitation** and **severe or profound core activity limitation**.

**disability-adjusted life year (DALY):** A year (1 year) of healthy life lost, either through premature death or equivalently through living with disability due to illness or injury. It is the basic unit used in burden of disease and injury estimates.

**discharge (Australian Defence Force):** Separation from the Australian Defence Force.

**discretionary foods:** Foods and drinks not necessary to provide the nutrients the body needs, but which may add variety. Many are high in saturated fats, sugars, salt and/or alcohol, and are energy dense.

**disease:** A physical or mental disturbance involving symptoms (such as pain or feeling unwell), dysfunction or tissue damage, especially if these symptoms and signs form a recognisable clinical pattern.

**disorder (health disorder):** A term used synonymously with **condition**.

**disposable household income:** Gross household income less income tax, the Medicare levy and the Medicare levy surcharge. It is the household income left after taxes are deducted that is available to support consumption and/or saving.

**domestic violence:** A set of violent behaviours between current or former intimate partners—typically, where one partner aims to exert power and control over another, usually through fear. Domestic violence can include physical violence, sexual violence, and emotional and psychological abuse.

**DPP4 inhibitors:** A class of oral diabetes drugs that work by inhibiting the enzyme dipeptidyl peptidase 4 (DPP4). This inhibiting action enhances the levels of active incretin hormones, which act to lower blood glucose levels by increasing insulin secretion and decreasing glucagon secretion (a hormone that has the opposite effect of insulin by increasing blood glucose levels).

**drug-induced deaths:** Deaths that include those due to acute instances of poisoning, or where drug use (including dependence) was thought to be the underlying causal factor. They are classified due to their intent—accidental, suicidal, undetermined intent or assault. Further, they include deaths from illicit drugs (for example, heroin, amphetamines and cocaine) and licit drugs (for example, benzodiazepines and anti-depressants). Alcohol- and tobacco-related deaths are excluded from this definition.

**drug-related hospitalisation:** Hospital care with selected principal diagnoses of drug use disorder or harm (accidental, intended or self-inflicted) due to selected drugs.

**dyslipidaemia:** Abnormal levels of fats, such as **cholesterol** or **triglycerides**, in the blood.

**elective surgery:** Elective care in which the procedures required by patients are listed in the surgical operations section of the Medicare Benefits Schedule, excluding specific procedures often done by non-surgical clinicians.

**emergency status (radiotherapy):** An indicator of whether the treatment required for the patient is clinically assessed as an emergency. An emergency is where the treating clinician has assessed that the waiting time for treatment cannot exceed 24 hours.

**emphysema:** A chronic lung disease where over-expansion or destruction of the lung tissue blocks oxygen intake, leading to shortness of breath and other problems.

**end-stage kidney disease (ESKD):** The most severe form of **chronic kidney disease (CKD)**, also known as Stage 5 CKD or kidney failure.

**epilepsy:** A common, long-term brain condition where a person has repeated seizures.

**estimated resident population (ERP):** The official Australian Bureau of Statistics estimate of the Australian population. The ERP is derived from the 5-yearly Census counts and is updated quarterly between each Census. It is based on the usual residence of the person. Rates are calculated per 1,000 or 100,000 mid-year (30 June) ERP.

**ex-serving (Australian Defence Force):** Includes serving, reserve, and ex-serving members in the Australian Defence Force.

**ex-smoker:** A person who has smoked at least 100 cigarettes or equivalent tobacco in his or her lifetime, but does not smoke now.

**extreme weather event:** An unusual weather event or phenomenon at the extreme of a 'typical' historical distribution, such as a violent storm, exceptionally high levels of rainfall, or a heat wave or drought that is longer or hotter than normal.

**family violence:** Violence between family members as well as between current or former intimate partners. For example, family violence can include acts of violence between a parent and a child. 'Family violence' is the preferred term used to identify experiences of violence for Indigenous people as it encompasses the broad range of extended family and kinship relationships within which violence may occur.

**fatal burden:** Quantified impact on a population of premature death due to disease or injury. Measured as **years of life lost (YLL)**.

**fertility rate:** Number of live births per 1,000 females aged 15–49.

**fetal death (stillbirth):** Death, before the complete expulsion or extraction from its mother, of a product of conception of 20 or more completed weeks of gestation, or of 400 g or more birthweight. Death is evidenced by the fact that, after such separation, the fetus does not breathe or show any other signs of life, such as beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles.

**filicide:** A homicide where a parent (or step-parent) kills a child.

**first trimester:** The first 3-months of a pregnancy. Pregnancy is divided into three trimesters: first trimester (conception to 13 weeks), second trimester (13 to 26 weeks) and third trimester (26 to 40 weeks).

**forceps:** Hand-held, hinged obstetric instrument applied to the fetal head to assist birth.

**full-time equivalent (FTE) workforce or workload:** A standard measure of the size of a workforce that takes into account both the number of workers and the hours that each works. For example, if a workforce comprises 2 people working full time 38 hours a week and 2 working half time, this is the same as 3 working full time—that is, an FTE of 3.

**gastrointestinal:** A term relating to the stomach and the intestine.

**gastrointestinal infection:** An infection that occurs when a micro-organism or its toxic product affects the gastrointestinal tract (including the stomach and intestines) causing illness such as pain, vomiting, diarrhoea and other symptoms.

**general inflation:** The rise in the general price level of goods and services in the economy.

**general practitioner (GP):** A medical practitioner who provides primary comprehensive and continuing care to patients and their families in the community.

**general private health insurance:** Private health insurance to cover non-hospital medical services that are not covered by Medicare, such as dental, optical, physiotherapy, other therapies and ambulance. Also known as 'ancillary' or 'extras' insurance.

**genomics:** The study of genes and their functions, and related techniques. Genomics addresses all genes and their interrelationships to identify their combined influence on the growth and development of the organism.

**gestational age:** Duration of pregnancy in completed weeks, calculated either from the date of the first day of a woman's last menstrual period to her baby's date of birth, or via ultrasound, or from clinical assessment during pregnancy, or from examination of the baby after birth.

**gestational diabetes:** A form of **diabetes** that is first diagnosed during pregnancy (gestation). It may disappear after pregnancy but signals a high risk of diabetes occurring later on in life. See **diabetes (diabetes mellitus)**.

**gonorrhoea:** A common sexually transmissible infection caused by *Neisseria gonorrhoeae* bacteria. It is treatable; however, if left untreated, it can lead to serious illness. It is a **notifiable disease**.

**gout:** A disease brought on by excess uric acid in the blood, causing attacks of joint pain (most often in the big toe) and other problems.

**gross domestic product (GDP):** A statistic commonly used to indicate national wealth. It is the total market value of goods and services produced within a given period after deducting the cost of goods and services used up in the process of production but before deducting allowances for the consumption of fixed capital.

**gum disease:** A disease of the gums and other tissues that attach teeth to the jaws.

**haemorrhage (bleeding):** The escape of blood from a ruptured blood vessel, externally or internally.

**haemorrhagic stroke:** A type of **stroke** caused by the rupture and subsequent bleeding of an artery in the brain or its surroundings.

**health:** Term relating to whether the body (including the mind) is in a well or ill state. With good health, the state of the body and mind are such that a person feels and functions well and can continue to do so for as long as possible.

**health-adjusted life expectancy:** The average number of years that a person at a specific age can expect to live in full health; that is, taking into account years lived in less than full health due to the health consequences of disease and/or injury.

**health administration:** Activities related to formulating and administering government and non-government health policy, and in setting and enforcing standards for health personnel and health services. One activity, for example, is the regulation and licensing of providers of health services.

The term includes only those administrative services that cannot be allocated to a particular health good or service. Such services might include, for example, maintaining an office for the Chief Medical Officer, a departmental liaison officer in the office of the Minister, or other agency-wide items for which it is not possible to derive appropriate or meaningful allocations to particular health programs.

**health indicator:** See **indicator**.

**health inflation:** The rise in the price level of goods and services in the health sector.

**health literacy:** The ability of people to access, understand and apply information about health and the health care system so as to make decisions that relate to their health.

**health outcome:** A change in the health of an individual or population due wholly or partly to a preventive or clinical intervention.

**health promotion:** A broad term to describe activities that help communities and individuals increase control over their health behaviours. Health promotion focuses on addressing and preventing the root causes of ill health, rather than on treatment and cure.

**health research:** Research with a health socioeconomic objective, which is done in tertiary institutions, private non-profit organisations, and government facilities. It excludes commercially oriented research that private business funds, the costs of which are assumed to be included in the prices charged for the goods and services (for example, medications that have been developed and/or supported by research activities).

**health status:** The overall level of health of an individual or population, taking into account aspects such as **life expectancy**, level of **disability**, levels of disease **risk factors** and so on.

**hearing:** The sense for perceiving sounds; includes regions within the brain where the signals are received and interpreted.

**hearing impairment:** Describes the degree of **impairment** associated with hearing loss in the 'better hearing ear', using a scale of mild, moderate, severe and profound. It is based on the degree of deviation from normal thresholds in the 'better ear', calculated as a 3frequency average of the threshold of hearing (in decibels Hearing Level; dB HL)—500 Hz (hertz), 1,000 Hz and 2,000 Hz.

**hearing loss:** Any hearing threshold response (using audiometry—the testing of a person's ability to hear various sound frequencies) outside the normal range, to any sound stimuli, in either ear. Hearing loss in a population describes the number of people who have abnormal hearing. Hearing loss may affect one ear (unilateral) or both ears (bilateral).

**heart attack:** Life-threatening emergency that occurs when a vessel supplying blood to the heart muscle is suddenly blocked completely by a blood clot. The medical term commonly used for a heart attack is myocardial infarction. See also **cardiovascular disease**.

**heart failure:** A condition that occurs when the heart functions less effectively in pumping blood around the body. It can result from a wide variety of diseases and conditions that can impair or overload the heart, such as heart attack, other conditions that damage the heart muscle directly (see **cardiomyopathy**), **high blood pressure**, or a damaged heart valve.

**hepatitis:** Inflammation of the liver, which can be due to certain viral infections, alcohol excess or a range of other causes.

**high blood cholesterol:** Total cholesterol levels above 5.5 mmol/L.

**high blood pressure/hypertension:** Definitions can vary but a well-accepted definition is from the World Health Organization: a systolic blood pressure of 140 mmHg or more or a diastolic blood pressure of 90 mmHg or more, or if [the person is] receiving medication for high blood pressure. Also see **blood pressure**.

**hospital private health insurance cover:** Private insurance cover for the cost of in-hospital treatment by medical practitioners, and hospital costs such as accommodation and theatre fees.

**hospital services:** Services provided to a patient who is receiving **admitted patient** services or non-admitted patient services in a hospital, but excluding community health services, health research done within the hospital, non-admitted dental services, patient transport services and public health activities. They can include services provided off site, such as dialysis or hospital in the home.

**hospitalisation:** Synonymous with **admission** and **separation**; that is, an episode of hospital care that starts with the formal admission process and ends with the formal separation process. An episode of care can be completed by the patient's being discharged, being transferred to another hospital or care facility, or dying, or by a portion of a hospital stay starting or ending in a change of type of care (for example, from acute to rehabilitation).

**household:** A group of two or more related or unrelated people who usually live in the same dwelling, and who make common provision for food or other essentials for living; or a single person living in a dwelling who makes provision for his or her own food and other essentials for living, without combining with any other person.

**housing adequacy:** A measure to assess whether a dwelling is overcrowded. The number of bedrooms a dwelling should have to provide freedom from crowding is determined by the Canadian National Occupancy Standard. This standard assesses bedroom requirements based on the following criteria:

- there should be no more than 2 people per bedroom
- children aged under 5 of different sexes may reasonably share a bedroom
- children aged 5 and over of opposite sex should have separate bedrooms
- children aged under 18 and of the same sex may reasonably share a bedroom
- single household members aged 18 and over should have a separate bedroom, as should parents or couples.

**human immunodeficiency virus (HIV):** A virus that damages the immune system and makes it harder for a person to fight infection. There is no cure for HIV but there are treatments available to stop its progression.

**hypertension:** See **high blood pressure**.

**illicit drugs:** Illegal drugs, drugs and volatile substances used illicitly, and pharmaceuticals used for non-medical purposes.

**illness:** A state of feeling unwell, although the term is also often used synonymously with disease.

**imaging:** See **diagnostic imaging**.

**immunisation:** A procedure designed to induce immunity against infection by using an antigen to stimulate the body to produce its own antibodies. See **vaccination**.

**immunochemical faecal occult blood test (iFOBT):** A test used to detect tiny traces of blood in a person's faeces that may be a sign of bowel cancer. The iFOBT is a central part of Australia's National Bowel Cancer Screening Program.

**impaired fasting blood glucose:** Blood glucose levels between 6.1 to 6.9 mmol/L, which is above normal but less than diabetes levels.

**impaired glucose regulation:** Condition in which blood glucose levels are higher than normal but less than required for a diagnosis of diabetes, but which signal an increased risk of developing **type 2 diabetes**.

**impairment:** Any loss or abnormality of psychological, physiological or anatomical structure or function.

**incidence:** The number of new cases (of an illness or event, and so on) occurring during a given period. Compare with **prevalence**.

**incidence relative risk (cancer):** The ratio of the observed cancer incidence rate in the study population to the estimated (weighted) rate in the comparison population(s).

**Index of Relative Socio-Economic Disadvantage (IRSD):** One of the set of **Socio-Economic Indexes for Areas** for ranking the average socioeconomic conditions of the population in an area. It summarises attributes of the population such as low income, low educational attainment, high unemployment and jobs in relatively unskilled occupations.

**indicator:** A key statistical measure selected to help describe (indicate) a situation concisely so as to track change, progress and performance; and to act as a guide for decision making. It may have an indirect meaning as well as a direct one; for example, Australia's overall death rate is a direct measure of mortality but is often used as a major indicator of population health. Taking this point further, time spent watching television may be used as one indicator of physical inactivity.

**Indigenous:** A person of Aboriginal and/or Torres Strait Islander descent who identifies as an Aboriginal and/or Torres Strait Islander. See also **Aboriginal or Torres Strait Islander**.

**indirect burden:** In burden of disease analysis (where the disease of interest is considered to be a risk factor (that is, disease-as-risk) for associated or 'linked' diseases), it is the burden from these linked diseases due to the disease-as-risk. For example, diabetes is considered to be a risk factor for coronary heart disease, stroke, dementia and other diseases, so the indirect burden is the burden attributable to diabetes for these linked diseases.

**induction of labour:** Intervention to stimulate the onset of labour.

**infant:** A child aged under 1.

**infant mortality rate:** The number of deaths among children aged under 1 in a given period, per 1,000 live births in the same period.

**inflammation:** Local response to injury or infection, marked by local redness, heat, swelling and pain. Can also occur when there is no clear external cause and the body reacts against itself, as in auto-immune diseases.

**influenza (flu):** An acute contagious viral respiratory infection marked by fever, fatigue, muscle aches, headache, cough and sore throat.

**instrumental delivery:** Vaginal delivery using **forceps** or **vacuum extraction**.

**insulin:** Hormone produced by the pancreas which regulates the body's energy sources, most notably the sugar glucose. It is an injectable agent that helps lower blood glucose levels by moving glucose into cells to be used as energy.

**intention of treatment (radiotherapy):** The reason treatment is provided to a patient; the intention may be:

- prophylactic
- curative
- palliative.

**International Classification for Primary Care, Version 2 (ICPC-2):** An internationally accepted classification system for primary care data.



## International Statistical Classification of Diseases and Related Health Problems

**(ICD):** The World Health Organization's internationally accepted classification of death and disease. The Tenth Revision (ICD-10) is currently in use. The ICD-10-AM is the Australian Modification of the ICD-10; it is used for diagnoses and procedures recorded for patients admitted to hospitals.

**intervention (for health):** Any action taken by society or an individual that 'steps in' (intervenes) to improve health, such as medical treatment and preventive campaigns.

**intimate partner violence:** A set of violent behaviours between current or former intimate partners. See also **domestic violence**.

**invasive meningococcal disease:** A serious though uncommon disease caused by *Neisseria meningitidis* bacteria. Five types cause human illness in Australia: serogroups A, B, C, W and Y. It is a **notifiable disease**.

**ischaemia:** A reduced or blocked blood supply. See also **ischaemic heart disease**.

**ischaemic heart disease:** See also **heart attack** and **angina** (chest pain). Also known as **coronary heart disease**. See also **ischaemia**.

**ischaemic stroke:** A type of **stroke** due to a reduced or blocked supply of blood in the brain. Also known as cerebral infarction.

**juvenile arthritis:** Inflammatory arthritis in children that begins before their 16th birthday and lasts at least 6 weeks. Also known as juvenile idiopathic arthritis.

**Kessler Psychological Distress Scale—10 items (Kessler-10; K10):** A survey device that is used to measure non-specific psychological distress in people. It uses 10 questions about negative emotional states that participants in the survey may have had in the 4 weeks leading up to their interview. The designers recommend using only for people aged 18 and over.

**kidney replacement therapy:** Having a functional **kidney transplant** or receiving regular **dialysis**.

**kidney transplant:** A procedure whereby a healthy kidney is taken from one person and surgically placed into someone with **end-stage kidney disease**. The kidney can come from a live or deceased donor.

**length of service (Australian Defence Force):** The time between the date of hire and date of discharge from the Australian Defence Force.

**life course:** A series of life stages that people are normally expected to pass through as they progress from birth to death. For example, stages often included are: birth and infancy, childhood, youth, working age, and older age.

**life expectancy:** An indication of how long a person can expect to live, depending on the age they have already reached. Technically, it is the number of years of life left to a person at a particular age if death rates do not change. The most commonly used measure is life expectancy at birth.

**lifetime risk (alcohol):** The accumulated risk from drinking either on many drinking occasions, or on a regular (for example, daily) basis over a lifetime. The lifetime risk of harm from alcohol-related disease or injury increases with the amount consumed. For healthy men and women, drinking no more than 2 standard drinks on any day reduces the lifetime risk of harm from alcohol-related disease or injury.

**linked disease:** A disease or condition on the causal pathway of the **risk factor**, and therefore more likely to develop if exposed to the risk.

**lipids:** Fatty substances, including **cholesterol** and **triglycerides**, that are in blood and body tissues.

**live birth (live born):** The complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life (such as the beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles), whether or not the umbilical cord has been cut or the placenta is attached; each product of such birth is considered live born (WHO definition).

**long-term condition:** A term used in the Australian Bureau of Statistics National Health Surveys to describe a health condition that has lasted, or is expected to last, at least 6 months. See also **chronic diseases/conditions**.

**low birthweight:** Weight of a baby at birth that is less than 2,500 grams.

**mammogram:** An X-ray of the breast. It may be used to assess a breast lump or as a screening test in women with no evidence of cancer.

**mandate:** An official order.

**maternal age:** Mother's age in completed years at the birth of her baby.

**measles:** A highly contagious infection, usually of children, that causes flu-like symptoms, fever, a typical rash and sometimes serious secondary problems such as brain damage. It is preventable by **vaccination**.

**median:** The midpoint of a list of observations that have been ranked from the smallest to the largest.

**median age:** The age point at which half the population is older than that age and half is younger than that age.

**medical services expenditure:** Expenditure on registered medical practitioners services. It excludes medical services provided to public patients admitted to public hospitals and medical services provided to public patients at outpatient clinics in public hospitals. Most medical services in Australia are provided on a fee-for-service basis and attract benefits from the Australian Government under Medicare. These include both private in-hospital medical services and out-of-hospital medical services.

This term also includes medical services not from the Medical Benefits Schedule, such as vaccines for overseas travel, as well as some expenditure by the Australian Government under alternative funding arrangements.

**medical specialist:** A doctor who has completed advanced education and clinical training in a specific area of medicine.

**Medicare:** A national, government-funded scheme that subsidises the cost of personal medical services for all Australians and aims to help them afford medical care. The Medicare Benefits Schedule (MBS) is the listing of the Medicare services subsidised by the Australian Government. The schedule is part of the wider Medicare Benefits Scheme (Medicare).

**Medicare levy:** A 2% tax on taxable income charged to fund Medicare. The Medicare levy is reduced if taxable income is below a certain threshold.

**Medicare levy surcharge:** A levy paid by Australian taxpayers who do not have private hospital cover and who earn above a certain income.

**medications:** Benefit-paid pharmaceuticals and other medications.

**melanoma:** A cancer of the body's cells that contain pigment (melanin), mainly affecting the skin. Survival rates are very high for those whose melanoma is detected and removed early, but low if not.

**mental illness** (or **mental disorders**): Disturbances of mood or thought that can affect behaviour and distress the person or those around them, so that the person has trouble functioning normally. They include **anxiety disorders**, **depression** and schizophrenia.

**mesothelioma:** An aggressive form of cancer occurring in the mesothelium—the protective lining of the body cavities and internal organs, such as the lungs, heart and bowel.

**metformin:** A medication that lowers blood glucose levels by reducing the amount of stored glucose released by the liver, slowing the absorption of glucose from the intestine, and helping the body to become more sensitive to insulin so that it works better.

**midwife:** A person, typically a woman, who is trained to help women in childbirth.

**mild or moderate core activity limitation:** The limitation of a person who needs no help but has difficulty with core activities (moderate) or has no difficulty (mild) with core activities, but uses aids or equipment, or has one or more of the following restrictions:

- cannot easily walk 200 metres
- cannot walk up and down stairs without a handrail
- cannot easily bend down to pick up an object from the floor
- cannot use public transport
- can use public transport but needs help or supervision
- needs no help or supervision but has difficulty using public transport.

See also **disability**, **core activity limitation** and **severe or profound core activity limitation**.

**monitoring (of health):** A process of keeping a regular and close watch over important aspects of the public's health and health services through various measurements, and then regularly reporting on the situation, so that the health system and society more generally can plan and respond accordingly. The term is often used interchangeably with surveillance, although surveillance may imply more urgent watching and reporting, such as the surveillance of infectious diseases and their epidemics. Monitoring can also be applied to individuals, such as hospital care where a person's condition is closely assessed over time.

**morbidity:** The ill health of an individual and levels of ill health in a population or group.

**mortality:** Number or rate of deaths in a population during a given time period.

**mortality relative risk:** The ratio of the observed mortality rate in the study population to the estimated (weighted) rate in the comparison population(s).

**multimorbidity:** A situation that occurs when a person has two or more health problems at the same time. Also known as **comorbidity**.

**multiple causes of death:** All the causes listed on the Medical Certificate of Cause of Death. These include the **underlying cause of death** and all **associated cause(s) of death**. See also **cause of death**.

**multiparous (multipara):** A pregnant woman who has had at least one previous pregnancy resulting in a live birth or stillbirth.

**musculoskeletal:** A term that relates to the muscles, joints and bones.

**musculoskeletal condition:** One of a group of conditions, along with arthritis and other conditions, that affects the bones, muscles and joints. These other conditions include **back pain and problems, juvenile arthritis, osteoarthritis, osteopenia, osteoporosis** (low bone density) and **rheumatoid arthritis**.

**My Health Record:** An online platform for storing a person's health information, including their Medicare claims history, hospital discharge information, diagnostic imaging reports, and details of allergies and medications.

**natural environment:** A setting that includes all vegetation and animal species (including micro-organisms), habitats and landscapes on earth, but excludes aspects of the environment that result from human activities. The natural environment includes air, water and climate.

**neonatal death:** The death of a live born baby within 28 days of birth.

**neural tube defects:** A group of serious birth defects that occur *in utero* during the development of the brain or spinal cord.

**neurology:** A branch of medicine concerned especially with the structure, function and diseases of the nervous system.

**never smoker:** A person who does not smoke now and has smoked fewer than 100 cigarettes or the equivalent tobacco in his or her lifetime.

**non-admitted patient:** A patient who receives care from a recognised non-admitted patient service/clinic of a hospital, including emergency departments and outpatient clinics.

**non-fatal burden:** The quantified impact on a population of ill health due to disease or injury. Measured as **years lived with disability (YLD)**, which is also sometimes referred to as **years of healthy life lost due to disability (YLL)**.

**non-hospital medical services:** Medical services delivered to patients who are not **admitted patients**.

**non-Indigenous:** People who have declared that they are not of Aboriginal or Torres Strait Islander descent. Compare with **Other Australians**.

**non-medical use:** The use of drugs either alone or with other drugs to induce or enhance a drug experience for performance enhancement or cosmetic purposes (this includes pain-killers/analgesics, tranquillisers/sleeping pills, steroids and meth/amphetamines and other opioids such as morphine or pethidine).

**non-organised sport:** Activities not organised by a club or recreation association—for example, running or walking for leisure.

**non-school qualification:** An educational qualification other than that of pre-primary, primary or secondary education. Non-school qualifications comprise a Bachelor degree; a Master degree; a Doctorate; a Diploma; a Graduate Diploma; an Advanced Diploma; a Certificate I, II, III and IV (trade certificates); and a Graduate Certificate.

**notifiable disease:** A group of communicable diseases that are reported to state and territory health departments, as required by legislation. The information enables public health responses and the **monitoring** of disease activity.

**nutrition:** The intake of food, considered in relation to the body's dietary needs.

**obesity:** Marked degree of overweight, defined for population studies as a **body mass index** of 30 or over. See also **overweight**.

**obesogenic environment:** An environment that promotes obesity among individuals and populations. It includes physical, economic, political and sociocultural factors.

**obstetrics:** The branch of medicine and surgery concerned with childbirth and midwifery.

**occupational exposures and hazards:** Chemical, biological, psychosocial, physical and other factors in the workplace that can potentially cause harm.

**occupational lung diseases:** Diseases that result from breathing in harmful dusts or fumes, such as silica, asbestos and coal dust. This exposure typically occurs in the workplace. Pneumoconiosis, or scarring of the lung tissue caused by inhaled dust, is one of the most common forms of occupational lung disease.

**odds ratio:** A measure of the association between an exposure and an outcome. The odds ratio represents the odds that an outcome will occur, given a particular exposure, compared with the odds of the outcome's occurring in the absence of that exposure. The value of the odds ratio is interpreted as:

- an odds ratio close or equal to 1 means that the exposure has little or no effect on the odds of the outcome's occurring
- an odds ratio greater than 1 means that the exposure increases the odds of the outcome's occurring
- an odds ratio less than 1 means that the exposure decreases the odds of the outcome's occurring.

**opioid:** A chemical substance that has a morphine-type action in the body. Opioids are most commonly used for pain relief, but they are addictive and can lead to drug dependence.

**opioid substitution therapy (OST):** The provision to opioid drug users of a prescription medicine that replaces their drug of choice (for example, heroin) and helps them to manage their addiction. This medicine is usually supplied in a clinically supervised setting. OST is also called opioid replacement therapy or maintenance therapy. The three medicines most commonly used as OST in Australia are methadone, buprenorphine and buprenorphine-nalaxone.

**optometry:** The practice of primary eye care, including testing for visual acuity and prescribing treatments for eye disorders.

**oral health:** The health of the mouth, tongue and oral cavity; the absence of active disease in the mouth.

**Organisation for Economic Co-operation and Development (OECD):** An organisation of 35 countries, including Australia, that are mostly developed and some emerging (such as Mexico, Chile and Turkey); the organisation's aim is to promote policies that will improve the economic and social wellbeing of people around the world.

**organised sport:** Activities done through an organisation, such as through a club or sporting body; this may also include school physical education classes.

**osteoarthritis:** A chronic and common form of **arthritis**, affecting mostly the spine, hips, knees and hands. It first appears from the age of about 30 and is more common and severe with increasing age.

**osteopenia:** A condition when bone mineral density is lower than normal but not low enough to be classified as osteoporosis.

**osteoporosis:** A condition that causes bones to become thin, weak and fragile, such that even a minor bump or accident can break a bone.

**Other Australians:** People who have declared that they are not of Aboriginal or Torres Strait Islander descent, and people whose Indigenous status is unknown. Compare with **non-Indigenous**.

**other health practitioner services:** Services that health practitioners (other than doctors and dentists) provide. These other practitioners include, but are not limited to, audiologists, chiropractors, dieticians, homeopaths, naturopaths, occupational therapists, optometrists, physiotherapists, podiatrists, practice nurses, practitioners of Chinese medicine and other forms of traditional medicine, and speech therapists.

**other medications:** Pharmaceuticals for which no **Pharmaceutical Benefits Scheme (PBS)** or **Repatriation Pharmaceutical Benefits Scheme (RPBS)** benefit was paid.

They include:

- pharmaceuticals listed in the PBS or RPBS, the total costs of which are equal to, or less than, the statutory patient contribution for the class of patient (under co-payment pharmaceuticals)
- pharmaceuticals dispensed through private prescriptions that do not fulfil the criteria for payment of benefit under the PBS or RPBS
- **over-the-counter** medicines, including pharmacy-only medicines, aspirin, cough and cold medicines, vitamins and minerals, herbal and other complementary medicines, and various medical non-durables, such as condoms, adhesive and non-adhesive bandages.

**other patients:** Primarily people whose hospitalisations were self-funded, or funded by worker's compensation, motor vehicle third party personal claims or the Department of Veterans' Affairs.

**other specified feeding and eating disorder:** An eating disorder that may present with symptoms of **anorexia nervosa**, **binge eating disorder** or **bulimia nervosa** but may not meet the full diagnosis criteria for any of these disorders individually. People with other specified feeding and eating disorder may present with symptoms such as disordered eating, weight control behaviour, distorted body image or an overvaluation of body weight or shape.

**otitis media:** All forms of inflammation and infection of the middle ear. Active inflammation or infection is nearly always associated with a middle ear effusion (fluid in the middle ear space).

**otitis media with effusion (OME):** The presence of an intact eardrum and middle ear fluid without symptoms or signs of acute infection. Other terms used to describe OME include 'glue ear', 'serious otitis media' and 'secretory otitis media'. OME may be episodic or persistent.

**outcome (health outcome):** A health-related change due to a preventive or clinical intervention or service. (The intervention may be single or multiple, and the outcome may relate to a person, group or population, or be partly or wholly due to the intervention.)

**out-of-pocket costs/expenditure:** The total costs incurred by individuals for health care services over and above any refunds from Medicare and private health insurance funds.

**over-the-counter medicines:** Medicine that one can buy without a prescription from a pharmacy or retail outlet.

**overweight:** Defined for the purpose of population studies as a **body mass index** of 25 or over. See also **obesity**.

**overweight but not obese:** Defined for the purpose of population studies as a **body mass index** between 25 and less than 30.

**palliative treatment (or palliative care):** Treatment given primarily to control pain or other symptoms. Consequent benefits of the treatment are considered secondary contributions to quality of life.

**Pap test:** See **Papanicolaou smear**.

**Papanicolaou smear (Pap smear):** a procedure to detect cancer and precancerous conditions of the female genital tract, which is the screening test of the National Cervical Screening Program. During a Pap test, cells are collected from the transformation zone of the cervix—the area of the cervix where the squamous cells from the outer opening of the cervix and glandular cells from the endocervical canal meet. This is the site where most cervical abnormalities and cancers are detected. For conventional cytology, these cells are transferred onto a slide, and sent to a pathology laboratory for assessment. Collected cells are then examined under a microscope to look for abnormalities.

**parricide:** A homicide where a child kills a parent or step-parent.

**pathology:** A general term for the study of disease, but often used more specifically to describe diagnostic services that examine specimens, such as samples of blood or tissue.

**patient days:** The number of full or partial days of stay for patients who were admitted to hospital for an episode of care and who underwent separation during the reporting period. A patient who is admitted and separated on the same day is allocated 1 patient day.

**patient transport services:** The services of organisations primarily engaged in transporting patients by ground or air—along with health (or medical) care. These services are often provided for a medical emergency, but are not restricted to emergencies. The vehicles are equipped with lifesaving equipment operated by medically trained personnel. Patient transport services include public ambulance services or flying doctor services, such as the Royal Flying Doctor Service and Care Flight.

Also included are patient transport programs, such as patient transport vouchers or support programs to help isolated patients with travel to obtain specialised health care. From 2003–04 onwards, this category includes patient transport expenses included in the operating costs of public hospitals.

**peacetime service:** Service provided by a Australian person who is serving, or has served, with a Peacekeeping Force outside Australia. These are military operations in support of diplomatic efforts to restore peace between belligerents, who may not be consenting to intervention and may be engaged in combat activities.

**peer worker:** A person employed (or engaged via contract), either part time or full time, on the basis of their lived experience, to support others experiencing a similar situation.

**performance indicators (of the health system):** Measures (**indicators**) that can relate to the health system as a whole or to parts of it (such as hospitals, health centres and so forth). The measures include accessibility, effectiveness, efficiency and sustainability, responsiveness, continuity of care and safety.

**perinatal:** Describes something that pertains to, or that occurred in, the period shortly before or after birth (usually up to 28 days after).

**perinatal death:** A fetal or **neonatal** death of at least 20 weeks gestation or at least 400 grams birthweight.

**perinatal mortality rate:** The number of **perinatal** deaths per 1,000 total births (fetal deaths plus live births).

**peripheral vascular disease:** A disease characterised by pain in the extremities, often the legs, due to an inadequate blood supply to them.

**permanent force:** Members of the permanent forces of the Australian Defence Force—Permanent Navy, Regular Army and Permanent Air Force—who usually serve in a full-time capacity and commit to an initial minimum period of service commensurate with the job role, rank and level of training.

**pertussis:** A highly infectious bacterial disease of the air passages marked by explosive fits of coughing and often a whooping sound on breathing in. It is preventable by **vaccination**. Also known as **whooping cough**.

**Pharmaceutical Benefits Scheme (PBS):** A national, government-funded scheme that subsidises the cost of a wide range of pharmaceutical drugs for all Australians to help them afford standard medications. The Schedule of Pharmaceutical Benefits (schedule) lists all the medicinal products available under the PBS and explains the uses for which they can be subsidised.

**pharmacotherapy:** The treatment of disease and illnesses using pharmaceutical drugs.

**physical therapy:** The treatment or management of physical disability, malfunction, or pain using therapeutic exercises, physical modalities such as massage and hydrotherapy, assistive devices, and patient education and training. Often referred to as physiotherapy.

**pneumonia:** Inflammation of the lungs as a response to infection by bacteria or viruses. The air sacs become flooded with fluid, and inflammatory cells and affected areas of the lung become solid. Pneumonia is often quite rapid in onset and marked by a high fever, headache, cough, chest pain and shortness of breath.



**population estimates:** Official population numbers compiled by the Australian Bureau of Statistics at both state and territory and statistical local area levels by age and sex, as at 30 June each year. These estimates allow geographical areas of differing population sizes and **age structures** to be compared.

**population health:** Typically, the organised response by society to protect and promote health, and to prevent illness, injury and disability. Population health activities generally focus on:

- prevention, promotion and protection rather than on treatment
- populations rather than on individuals
- the factors and behaviours that cause illness.

In this sense, the term is often used synonymously with **public health**. It can also refer to the health of particular subpopulations, and comparisons of the health of different populations.

**post-neonatal death:** The death of a live born baby after 28 days and within 1 year of birth.

**post-partum:** A term that indicates an occurrence after childbirth, with reference to the mother.

**post-traumatic stress disorder (PTSD):** The development of a set of reactions in people who have experienced a traumatic event that might have threatened their life or safety, or others around them. Examples of traumatic events can include war or torture, serious accidents, physical or sexual assault, or disasters. A person who has PTSD can experience feelings of helplessness, horror or intense fear.

**potentially avoidable deaths:** Deaths among people younger than age 75 that are avoidable in the context of the present health care system. They include deaths from conditions that are potentially preventable through individualised care and/or treatable through existing primary or hospital care. They are a subset of **premature deaths**. The rate of potentially avoidable deaths in Australia is used as an indicator of the health system's effectiveness. Potentially avoidable deaths are classified using nationally agreed definitions. (A revised definition was adopted in the National Healthcare Agreement 2015 leading to differences in the counts and rates of potentially avoidable deaths published previously.)

**potentially preventable hospitalisations (PPHs):** Hospital separations for a specified range of conditions where hospitalisation is considered to be largely preventable if timely and adequate care had been provided through population health services, primary care and outpatient services. The PPH conditions are classified as vaccine preventable, chronic and acute. Respective examples include **influenza** and **pneumonia, diabetes complications** and **COPD**, and dental and kidney conditions. The rate of PPHs is currently being used as an indicator of the effectiveness of a large part of the health system, other than hospital inpatient treatment.

**pre-eclampsia:** A condition that complicates pregnancy and is characterised by high blood pressure, fluid retention and protein in the urine. The placental function may be compromised.

**premature deaths** (or **premature mortality**): Deaths that occur at a younger age than a selected cut-off. The age below which deaths are considered premature can vary depending on the purpose of the analysis and the population under investigation. In this report, deaths among people aged under 75 are considered premature.

**prescription pharmaceuticals:** Pharmaceutical drugs available only on the prescription of a registered medical or dental practitioner and available only from pharmacies.

**pre-term birth:** Birth before 37 completed weeks of gestation.

**prevalence:** The number or proportion (of cases, instances, and so forth) in a population at a given time. For example, in relation to cancer, refers to the number of people alive who had been diagnosed with cancer in a prescribed period (usually 1, 5, 10 or 26 years). Compare with **incidence**.

**prevention (of ill health or injury):** Action to reduce or eliminate the onset, causes, complications or recurrence of ill health or injury.

**principal diagnosis:** The diagnosis established after study to be chiefly responsible for occasioning an episode of patient care (**hospitalisation**), an episode of residential care or an attendance at the health care establishment.

**primary health care:** These are services delivered in many settings, such as general practices, community health centres, Aboriginal health services and allied health practices (for example, physiotherapy, dietetic and chiropractic practices) and come under numerous funding arrangements. Expenditure on primary health care includes **recurrent expenditure** on health goods and services, such as on medical services, dental services, other health practitioner services, pharmaceuticals and community and public health services.

**Primary Health Network:** Primary Health Networks were established on 1 July 2015. These networks are intended to play a critical role in connecting health services across local communities so that patients, particularly those needing coordinated care, have the best access to a range of health care providers, including practitioners, community health services and hospitals. Primary Health Networks work directly with general practitioners, other primary care providers, secondary care providers and hospitals.

**prisoner:** An adult aged 18 and over held in custody, whose confinement is the responsibility of a corrective services agency. Prisoners includes sentenced prisoners, and prisoners held in custody awaiting trial or sentencing (remandees). Juvenile offenders, people in psychiatric custody, police cell detainees, people held in immigration detention centres, or Australians held in overseas prisons, are not included.

**private health insurance patients:** Patients whose hospitalisations had any funding from private health insurance.

**private hospital:** A privately owned and operated institution, catering for patients who are treated by a doctor of their own choice. Patients are charged fees for accommodation and other services provided by the hospital and by relevant medical and allied health practitioners. The term includes **acute care** and psychiatric hospitals as well as private free-standing day hospital facilities.

**private patient:** A person admitted to a private hospital, or a person admitted to a public hospital who decides to choose the doctor(s) who will treat them or to have private ward accommodation—this means they will be charged for medical services, food and accommodation.

**procedure:** A clinical intervention that is surgical in nature, carries a procedural risk, carries an anaesthetic risk, and requires specialist training and/or special facilities or equipment available only in the acute-care setting.

**prophylactic treatment:** Treatment given to prevent the occurrence of disease at a site that shows no sign of active disease but is considered to be at risk.

**protective factors:** Factors that enhance the likelihood of positive outcomes and lessen the chance of negative consequences from exposure to risk.

**psychological distress:** Unpleasant feelings or emotions that affect a person's level of functioning and interfere with the activities of daily living. This distress can result in having negative views of the environment, others and oneself, and manifest as symptoms of mental illness, including anxiety and depression (see also **Kessler Psychological Distress Scale**).

**public health:** Activities aimed at benefiting a population, with an emphasis on prevention, protection and health promotion as distinct from treatment tailored to individuals with symptoms. Examples include the conduct of anti-smoking education campaigns, and screening for diseases such as cancer of the breast and cervix. See also **population health**.

**public hospital:** A hospital controlled by a state or territory health authority. In Australia, public hospitals offer free diagnostic services, treatment, care and accommodation to all eligible patients.

**public hospital services expenditure:** Services provided by public hospitals from the balance of public hospital expenditure remaining after costs of community health services, public health services, non-admitted dental services, patient transport services, and health research activities conducted by public hospitals have been removed and reallocated to their own expenditure categories.

**public patients:** Patients who are admitted to hospital at no charge and are mostly funded through public sector health or hospital service budgets.

**quintile:** A group derived by ranking the population or area according to specified criteria and dividing it into five equal parts. The term can also mean the cut-points that make these divisions—that is, the 20th, 40th, 60th and 80th percentiles—but the first use is the more common one. Commonly used to describe socioeconomic areas based on **socioeconomic position**.

**Rank (Australian Defence Force):** A term that describes one's position in the Australian Defence Force operational hierarchy. Analysis by rank is presented for two broad groups: **commissioned officer**, and **all ranks other than commissioned officer**.

**rate:** A rate is one number (the numerator) divided by another number (the denominator). The numerator is commonly the number of events in a specified time. The denominator is the population 'at risk' of the event. Rates (crude, age-specific and age-standardised) are generally multiplied by a number such as 100,000 to create whole numbers.

**real expenditure:** Expenditure that has been adjusted to remove the effects of inflation (for example, expenditure for all years has been compiled using 2015–16 prices). Removing the effects of inflation allows comparisons to be made between expenditures in different years on an equal dollar-for-dollar basis. Changes in real expenditure measure the change in the volume of goods and services produced (see **constant prices**).

**reason for discharge (Australian Defence Force):** The main reason recorded for a person's separating (discharging) from the Australian Defence Force. Analysis by reason for discharge is presented for two broad groups: voluntary discharge—includes voluntary

redundancies and resignations; and involuntary discharge—comprises personnel deemed unsuitable for further duty for disciplinary, medical and operational reasons. Involuntary discharge is further divided into discharge for medical reasons, and non-medical involuntary discharge (which includes being physically unfit for service, training failure and disciplinary reasons).

**recent user (alcohol and other drugs):** Someone who has used in the last 12 months.

**record linkage:** See **data linkage**.

**recurrent expenditure:** Spending (expenditure) on goods and services that are used during the year (for example, salaries). Compare with **capital expenditure**.

**referred medical services:** Non-hospital medical services that are not classified as primary health care (see **unreferred medical services**).

**refugee:** A person who is subject to persecution in their home country and in need of resettlement. The majority of individuals considered to be a refugee are identified by the United Nations High Commissioner for Refugees (UNHCR) and referred by the UNHCR to Australia.

**relative income poverty:** A situation where a family's income is low compared with that of other families. It is assessed by the proportion of households with an equivalised income that is less than 50% of the national median equivalised household income.

**relative risk:** This measure is derived by comparing two groups for their likelihood of an event. It is also called the risk ratio because it is the ratio of the risk in the 'exposed' population divided by the risk in the 'unexposed' population. It is also known as the rate ratio.

**relative survival (cancer):** A measure of the average survival experience of a population of people diagnosed with cancer, relative to the 'average' Australian of the same sex and age, at a specified interval after diagnosis.

**remoteness classification:** Each state and territory is divided into several regions based on their relative accessibility to goods and services (such as to general practitioners, hospitals and specialist care) as measured by road distance. These regions are based on the **Accessibility/Remoteness Index of Australia** and defined as Remoteness Areas by either the **Australian Standard Geographical Classification (ASGC)** (before 2011) or the **Australian Statistical Geographical Standard (ASGS)** (from 2011 onwards) in each Census year. The five Remoteness Areas are *Major cities*, *Inner regional*, *Outer regional*, *Remote* and *Very remote*. See also **rural**.

**Repatriation Pharmaceutical Benefits Scheme (RPBS):** An Australian government scheme that provides a range of pharmaceuticals and wound dressings at a concessional rate for the treatment of eligible veterans, war widows/widowers, and their dependants.

**reserve/reservist:** An Australian Defence Force member in the active or inactive reserve forces of the Navy, Army or Air Force. Most members leaving full-time service make the transition to the inactive reserve forces, unless there are medical or other grounds preventing this.

**respiratory condition:** A chronic respiratory condition affecting the airways and characterised by symptoms such as wheezing, shortness of breath, chest tightness and cough. Conditions include **asthma** and **chronic obstructive pulmonary disease (COPD)**—which includes **emphysema** and chronic bronchitis.

**resuscitation of baby:** Active measure taken shortly after birth to assist the baby's ventilation and heartbeat, or to treat depressed respiratory effort to correct metabolic disturbances.

**revascularisation:** A procedure to restore adequate blood flow to the heart or other part of the body, usually after the supply has been reduced or blocked, as in **angina** or a **heart attack**. Revascularisation includes methods such as angioplasty and coronary artery bypass graft surgery.

**rheumatoid arthritis:** A chronic, multisystem disease whose most prominent feature is joint **inflammation** and resulting damage, most often affecting the hand joints in symmetrical fashion. It can occur in all age groups but most commonly appears between ages 20–40. Its causes are not certain but involve auto-immune processes.

**risk:** The probability of an event's occurring during a specified period of time.

**risk factor:** Any factor that represents a greater risk of a health disorder or other unwanted condition or event. Some risk factors are regarded as causes of disease; others are not necessarily so. Along with their opposites (protective factors), risk factors are known as **determinants**.

**rural:** Geographic areas outside urban areas such as towns and cities. In this report, rural and remote encompasses all areas outside Australia's *Major cities* according to the **remoteness classification** of the **Australian Statistical Geographic Standard**. In many instances, the term 'rural and remote' is used interchangeably with the classification terms 'regional and remote'.

**saturated fats:** Fats, most often of animal origin, that are solid at room temperature and whose fatty acid chains cannot incorporate additional hydrogen atoms. In excess, they tend to raise blood cholesterol.

**screening (for health):** A systematic method of detecting **risk factors** or suspicious abnormalities among people who are symptom free, so that health problems can be either prevented or followed up, diagnosed and treated as early as possible.

Screening is usually done through special programs aimed at higher risk groups in the population. A variant of screening, often known as case-finding, is where clinicians opportunistically look for risk factors or abnormalities in people when seeing them for other reasons; for example, when many doctors routinely measure blood pressure in all patients consulting them.

**screen time:** Activities done in front of a screen, such as watching television, working on a computer, or playing video games.

**separation (from hospital):** The formal process where a hospital records the completion of an episode of treatment and/or care for an **admitted patient**—in this report, described by the term **hospitalisation**.

**separation (from military service):** See **discharge**.

**service (Australian Defence Force):** The three broad arms of the Australian Defence Force—the Navy, Army and Air Force.

**serving full time (Australian Defence Force):** A term that describes Australian Defence Force members serving in a regular capacity in the Navy, Army or Air Force on continuous full-time service, or participating in the gap year program.

**severe or profound core activity limitation:** The limitation of a person who needs help or supervision always (profound) or sometimes (severe) to perform activities that most people undertake at least daily—that is, the core activities of self-care, mobility and/or communication. See also **core activity limitation** and **disability**.

**sexual violence:** The occurrence, attempt or threat of sexual assault experienced by a person since the age of 15. Sexual violence can be perpetrated by partners in a domestic relationship, former partners, other people known to the victims, or strangers.

**sexually transmissible infection:** An infectious disease that can be passed from one person to another by sexual contact. Examples include **chlamydia** and **gonorrhoea** infections.

**siblicide:** A homicide where one sibling kills another sibling.

**single-occasion risk (alcohol):** A single-occasion risk, in the context of alcohol, is defined as the risk of alcohol-related injury arising from having a sequence of drinks without the blood alcohol concentration reaching zero in between them. The risk of an alcohol-related injury arising from a single occasion of drinking increases with the amount consumed. For healthy men and women, drinking no more than 4 standard drinks on a single occasion reduces the risk of alcohol-related injury from that occasion.

**sleep apnoea:** A situation that occurs when a person repeatedly stops breathing during sleep. It has the same cause as snoring—reduced air flow at the back of the mouth—but is more extreme. More common in males and the obese, it leads to poorer mental functioning during the day and a greater risk of accidents.

**smartphone:** A mobile phone built on a mobile operating system, with more advanced computing capability and connectivity.

**smartwatch:** A mobile device, consisting of a package that includes a computer and display, attached to a bracelet.

**smoker:** Someone who reports smoking daily, weekly or less than weekly.

**social determinants of health:** The circumstances in which people are born, grow up, live, work and age, and the systems put in place to deal with illness. These circumstances are in turn shaped by a wider set of forces: economics, social policies and politics.

**social exclusion:** A situation where people do not have the resources, opportunities and capabilities they need to learn, work, engage with or have a voice in their communities. Composite measures of social exclusion weight indicators such as income level, access to education, unemployment, poor English, health services and transport, and non-material aspects such as stigma and denial of rights. These measures are typically divided into three levels: marginal exclusion, deep exclusion and very deep exclusion.

**Socio-Economic Indexes for Areas (SEIFA):** A set of indexes, created from Census data, that aim to represent the **socioeconomic position** of Australian communities and identify areas of advantage and disadvantage. The index value reflects the overall or average level of disadvantage of the population of an area; it does not show how individuals living in the same area differ from each other in their socioeconomic group. This report uses the **Index of Relative Socio-Economic Disadvantage**.

**socioeconomic position:** An indication of how 'well off' a person or group is. In this report, socioeconomic areas are mostly reported using the **Socio-Economic Indexes for Areas**, typically for five groups (**quintiles**)—from the most disadvantaged (worst off or lowest socioeconomic area) to the least disadvantaged (best off or highest socioeconomic area).

**solar ultraviolet (UV) radiation:** High-energy rays from the sun which are invisible to the human eye. UV radiation is divided into three types according to wavelength (UVA, UVB and UVC). UVA, and to a lesser extent UVB, are not wholly absorbed by atmospheric ozone and therefore are of interest for human health.

**specialist attendance:** A specialist attendance is a referred patient-doctor encounter (with Medicare funding benefits), such as a visit, consultation and attendance (including a video conference) with a medical practitioner who has been recognised as a specialist or consultant physician for the purposes of Medicare benefits.

**specialist services:** Services that support people with specific or complex health conditions and issues, who are generally referred by primary health care providers. They are often described as 'secondary' health care services. In many cases, a formal referral is required for an individual to be able to access the recommended specialist service.

**spontaneous labour:** The onset of labour without intervention.

**standard drink (alcohol):** A serve that contains 10 grams of alcohol (equivalent to 12.5 millilitres of alcohol). It is also referred to as a full serve.

***Staphylococcus aureus* bacteraemia (SAB):** An infection of the bloodstream. When associated with health care procedures, these infections are considered to be potentially preventable.

**statins:** A class of drugs commonly used to lower blood cholesterol.

**statistical significance:** A statistical measure indicating how likely the observed difference or association is due to chance alone. Rate differences are deemed to be statistically significant when their **confidence intervals** do not overlap, since their difference is greater than what could be explained by chance.

**stillbirth:** See **fetal death (stillbirth)**.

**stroke:** An event that occurs when an artery supplying blood to the brain suddenly becomes blocked or bleeds. A stroke often causes paralysis of parts of the body normally controlled by that area of the brain, or speech problems and other symptoms. It is a major form of **cerebrovascular disease**.

**substance misuse:** Use of **illicit drugs** (illegal drugs, drugs and volatile substances used illicitly, and pharmaceuticals used for non-medical purposes).

**substance use disorder:** A disorder of harmful use and/or dependence on illicit or licit drugs, including alcohol, tobacco and prescription drugs.

**suicidal ideation:** Serious thoughts about ending one's own life.

**suicidality:** The collective term for **suicidal ideation**, **suicide** plans and suicide attempts.

**suicide:** An action to deliberately end one's own life.

**sulfonylureas:** A class of medicines that lower blood glucose levels by stimulating the pancreas to release more insulin.

**suppurative:** A term that describes pus produced in response to inflammatory bacterial infections.

**syphilis (infectious):** A **sexually transmitted infection**, which if untreated can cause irreversible damage. It is caused by *Treponema pallidum* bacteria. It is a **notifiable disease**.

**tablet (information and communication technologies):** A hand-held, internet-enabled, wireless personal computer, usually having a touchscreen or a digital pen-enabled interface, and no hardware keyboard.

**telehealth:** Health services delivered using information and communication technologies, such as videoconferencing.

**thromboembolism:** The obstruction of a blood vessel, usually a large vein, with thrombotic material carried in the blood from its site of origin to block another vessel.

**tooth decay:** Decay of the teeth caused by **caries**, and progressing to cavities in the enamel and the dentine.

**trachoma:** An infectious disease of the eye caused by *Chlamydia trachomatis*. If left untreated, follicles form on the upper eyelids and grow larger until the granulations invade the cornea, eventually causing blindness.

**Transition (Australian Defence Force):** In the context of military services, the process of moving from full-time Australian Defence Force service into civilian life.

**treatment episode:** The period of contact between a client and a treatment provider or a team of providers. In the context of alcohol and other drug treatment, each treatment episode has 1 principal drug of concern and 1 main **treatment type**. If the principal drug or main treatment changes, a new episode is recorded.

**treatment type:** In the context of alcohol and other drug treatment, the type of activity that is used to treat the client's alcohol or other drug problem. Examples include assessment only, counselling, information and education only, pharmacotherapy, rehabilitation, support and case management only, and withdrawal management (detoxification).

**triage category:** A category used in the emergency departments of hospitals to indicate the urgency of a patient's need for medical and nursing care. Patients are triaged into 1 of 5 categories on the Australasian Triage Scale. The triage category is allocated by an experienced registered nurse or medical practitioner.

**triglyceride:** A compound made up of a single molecule of glycerol and three molecules of fatty acid. Triglycerides are the main constituents of natural fats and oils.

**type 1 diabetes:** A form of **diabetes** mostly arising among children or younger adults and marked by a complete lack of insulin. Insulin replacement is needed for survival. See **diabetes (diabetes mellitus)**.

**type 2 diabetes:** The most common form of **diabetes**, occurring mostly in people aged 40 and over, and marked by reduced or less effective insulin. See **diabetes (diabetes mellitus)**.

**Under-five mortality rate:** see **child mortality rate**.



**underlying cause of death:** The disease or injury that initiated the train of events leading directly to death, or the circumstances of the accident or violence that produced the fatal injury. See also **cause of death** and **associated cause(s) of death**.

**underweight:** A category defined for population studies as a **body mass index** less than 18.5.

**unreferred medical service:** A medical service provided to a person by, or under the supervision of, a medical practitioner—being a service that has not been referred to that practitioner by another medical practitioner or person with referring rights. In this report, these are medical services that are classified as primary health care (see **referred medical services**).

**vaccination:** The process of administering a vaccine to a person to produce immunity against infection. See **immunisation**.

**vacuum extraction:** A procedure to assist birth using traction or rotation on a suction cap applied to the baby's head.

**vascular risk factors:** Metabolic and behavioural **risk factors** that increase the risk of vascular disease. They also increase the risk of some vascular diseases themselves ('diseases-as-risks', such as **diabetes**, **stroke**, **atrial fibrillation** and **chronic kidney disease**) that involve or increase the risk of damaged blood vessels, and which jointly and individually increase the risk of **dementia**.

**vector-borne disease:** A disease, parasite or infection transmitted from one host to another by a vector. The largest group of vectors are insects and other arthropods, most commonly mosquitoes, ticks, flies, lice and fleas. The abundance and distribution of vector populations (and hence the spread of vector-borne diseases) is closely intertwined with environmental conditions that encourage their survival.

**weighting:** Adjustment of the characteristics of one group so they are statistically similar to the characteristics of another group so that comparisons of the effect under study can be more certain.

**wellbeing:** A state of health, happiness and contentment. It can also be described as judging life positively and feeling good. For public health purposes, physical wellbeing (for example, feeling very healthy and full of energy) is also viewed as critical to overall wellbeing. Because wellbeing is subjective, it is typically measured with self-reports, but objective indicators (such as household income, unemployment levels and neighbourhood crime) can also be used.

**whooping cough:** See **pertussis**.

**workforce:** People who are employed or unemployed (not employed but actively looking for work). Also known as the labour force.

**years lived with disability (YLD):** A measure calculated as the prevalence of a condition, multiplied by a disability weight for that condition. Sometimes referred to as **years of healthy life lost due to disability (YLD)**.

**years of healthy life lost due to disability:** See **years lived with disability (YLD)**.

**years of life lost (YLL):** For each new case, years of life lost equals the number of years between premature death and the standard life expectancy for the individual.

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- Australia's health system
- Causes of ill health
- Determinants of health
- Health of population groups
- Indigenous health
- Prevention, treatment and health services

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