



# Chapter 5

## Repeat analyses

### Introduction

This chapter examines changes over time in numbers of Pharmaceutical Benefits Scheme (PBS) prescriptions dispensed for the following items mapped in the first *Australian Atlas of Healthcare Variation*:

- Antimicrobial medicines dispensing, all ages
- Amoxicillin and amoxicillin–clavulanate dispensing, all ages
- Antipsychotic medicines dispensing, 17 years and under
- Antipsychotic medicines dispensing, 18–64 years
- Antipsychotic medicines dispensing, 65 years and over
- Attention deficit hyperactivity disorder (ADHD) medicines dispensing, 17 years and under
- Opioid medicines dispensing, all ages.

These are among the most commonly prescribed medicines in Australia, and are effective treatments when used for the right patient at the right dose and duration, for the right condition. When used outside these indications, these medicines can potentially expose individuals and the community to avoidable harms and unnecessary costs.

The first Atlas showed large variations in dispensing rates of PBS prescriptions for these medicines according to where people live in 2013–14. The findings suggested that some people may be missing out on effective treatment while others may be taking these medicines for little or no benefit.<sup>1</sup>

# Introduction

## Why explore use of these medicines over time?

Growing concerns about the potential harms to individuals and the community from high and rising use of these medicines demonstrates a clear need to monitor variations in their use across Australia.

### Antimicrobials

Monitoring use is a national priority for antimicrobials. Antimicrobial resistance is a global threat to human health.<sup>2,3</sup> Findings from the third Atlas will complement data collected by the Antimicrobial Use and Resistance in Australia (AURA) Surveillance System, and support national, state and local initiatives to improve prescribing of antimicrobial medicines.<sup>2,3</sup>

### Antipsychotic and ADHD medicines

The third Atlas findings on antipsychotic medicines and ADHD medicines are of particular importance for better understanding use among key prescribers.

The third Atlas revisits these medicine items and examines use over time (from 2013–14 to 2016–17) with the aims of:

- Monitoring rises and falls in rates nationally
- Monitoring changes in the magnitude of variation across Australia
- Understanding whether more effort is needed to promote safe and appropriate use of these medicines.

### Opioids

Improving opioid medicines use is a national priority as a result of recent increases in misuse, overdose and opioid dependence.<sup>4,5</sup> Between 2011 and 2015, twice as many people died from overdose due to an opioid medicine than due to heroin (2,145 compared with 985).<sup>6</sup> Opioids are one of the priority substances identified in the National Drug Strategy 2017–2026.<sup>7</sup> Increased opioid misuse has also prompted a number of national regulatory and policy responses in Australia over the past three years to support harm minimisation.<sup>5,8</sup>

The Australian Commission on Safety and Quality in Health Care (the Commission) will publish a detailed analysis of the data in this chapter in 2019, including recommendations for improving the appropriate use of these medicines. However, because of the work that has already been undertaken on use of antipsychotic medicines in people aged 65 years and over, and ongoing concerns that these medicines are being prescribed inappropriately, recommendations on this topic are included in this Atlas on page 237.

The 2019 report will also include analyses by state and territory, and local area, which will help to inform interventions by health departments and health service organisations for improving the safe and appropriate use of these medicines.

## Recommendations

Recommendations for improving the safe and appropriate use of antipsychotic medicines in people aged 65 years and over are included below. Recommendations for the other topics in this chapter will be published in 2019.

5a. Prescribers to use antipsychotic medicines for people 65 years and over as a form of restrictive practice only as a last resort, and not until alternative strategies have been considered. The following conditions must be met:

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- i. Informed consent (from the patient or a properly authorised substitute decision maker) to be given in writing

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  - ii. A structured consent form to be mandated for use in aged care homes to help ensure that prescribers comply with clinical and legal requirements

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  - iii. A pharmacist to conduct a medicines review after six months, with the outcomes of the review provided to the treating general practitioner and placed in the medication record

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  - iv. Approval of pro re nata (PRN) orders to be no more than three times a month, and repeat PRN prescription to be limited so that renewal is only permitted after a further evaluation of the resident by the prescribing practitioner.
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5b. Aged care providers to record the use of antipsychotic medicines as a form of restrictive practice on all applicable patients in their aged care home and report on this to the Aged Care Quality and Safety Commission.

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5c. The Aged Care Quality and Safety Commission accreditation assessments to review the use of psychotropic agents in aged care homes.

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5d. The Aged Care Quality and Safety Commission to commence public reporting from July 2020 on rate of use of antipsychotic medicines, in line with recommendation 13 of the 2014 Senate Community Affairs References Committee on care and management of younger and older Australians living with dementia and behavioural and psychological symptoms of dementia (BPSD).

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5e. The Aged Care Quality and Safety Commission to consider approaches to educating consumers about the risks of prescribing antipsychotic medicines outside guideline recommendations – such as for BPSD – before secondary causes have been excluded and non-pharmacological measures have been tried.

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5f. The Therapeutic Goods Administration (TGA) to review product information for all the antipsychotics most commonly prescribed inappropriately for BPSD in older people, to ensure that the lack of evidence of efficacy and the harms associated with use for BPSD are expressed as clearly as possible, and the product information is optimally framed to discourage prescribing for unapproved use for BPSD.

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5g. The TGA to establish and/or review risk management plans for atypical antipsychotic medicines commonly prescribed for BPSD outside therapeutic guidelines. This will include requiring sponsors to more proactively provide or support education in appropriate treatment options for BPSD, emphasising the significant clinical risks and lack of efficacy in using antipsychotic medicines for this purpose.

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5h. The Pharmaceutical Benefits Advisory Committee to review the relevant PBS streamlined authority as it applies to the prescribing of atypical antipsychotic medicines to ensure sufficient information about the clinical justification for prescribing of these medicines. This should include the condition for which the medicine is being prescribed, and a record that consent or substitute consent has been provided. This information should be specified on the form which is provided to the dispensing pharmacist.

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## References

1. Australian Commission on Safety and Quality in Health Care, National Health Performance Authority. Australian Atlas of Healthcare Variation. Sydney: ACSQHC; 2015.
2. Australian Government Department of Health, Australian Government Department of Agriculture and Water Resources. Australia's first national antimicrobial resistance strategy 2015–2019: progress report. Canberra: Australian Government; 2017.
3. Australian Government Department of Health, Australian Government Department of Agriculture and Water Resources. Antimicrobial resistance [Internet]. Canberra: Department of Health; 2017 [cited 2018 Sep]. Available from: [www.amr.gov.au/](http://www.amr.gov.au/)
4. Dobbin M. Pharmaceutical drug misuse in Australia. *Aust Prescr* 2014;37:79–81.
5. Therapeutic Goods Administration. Prescription strong (Schedule 8) opioid use and misuse in Australia: options for a regulatory response. Consultation paper. Version 1.0. Canberra: TGA; 2018. [www.tga.gov.au/sites/default/files/consultation-prescription-strong-schedule-8-opiod-use-misuse-in-australia-options-for-regulatory-response.pdf](http://www.tga.gov.au/sites/default/files/consultation-prescription-strong-schedule-8-opiod-use-misuse-in-australia-options-for-regulatory-response.pdf) (accessed Aug 2018).
6. Penington Institute. Australia's annual overdose report 2017. Melbourne: Penington Institute; 2017. [www.penington.org.au/australias-annual-overdose-report-2017/](http://www.penington.org.au/australias-annual-overdose-report-2017/) (accessed Aug 2018).
7. Australian Government Department of Health. National drug strategy 2017–2026. Canberra: Department of Health; 2017. [www.health.gov.au/internet/main/publishing.nsf/Content/55E4796388E9EDE5CA25808F00035035/\\$File/National-Drug-Strategy-2017-2026.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/55E4796388E9EDE5CA25808F00035035/$File/National-Drug-Strategy-2017-2026.pdf) (accessed Jul 2018).
8. Australian Government National Drug Strategy. National pharmaceutical drug misuse framework for action (2012–2015). Canberra: Australian Government; 2013. [www.nationaldrugstrategy.gov.au/internet/drugstrategy/Publishing.nsf/content/drug-mu-frm-action](http://www.nationaldrugstrategy.gov.au/internet/drugstrategy/Publishing.nsf/content/drug-mu-frm-action) (accessed Aug 2018).

# 5.1 Antimicrobial medicines dispensing, all ages

## Context

This section examines antimicrobial medicines dispensing in Australia from 2013–14 to 2016–17 for people of all ages.

Antimicrobial medicines are used to treat microbial infections. They include antibiotics (or antibacterials), antivirals and antifungals. Use is often driven by factors such as physician experience, patient factors, the incidence of infection, and the prevalence of antimicrobial resistance.<sup>1</sup>

The rate of antimicrobial dispensing per 100,000 people in all age groups was mapped in the first *Australian Atlas of Healthcare Variation*, published in November 2015. The first Atlas reported that, in 2013–14, more than 30 million Pharmaceutical Benefits Scheme (PBS) prescriptions for antimicrobial medicines were dispensed in Australia. Dispensing rates tended to be higher in areas with socioeconomic disadvantage. This is consistent with poorer health outcomes and higher infection rates observed in areas with socioeconomic disadvantage. Dispensing rates were lower in areas with socioeconomic advantage, as well as in remote communities. Low dispensing rates in remote communities were partly attributed to medicines dispensed by remote-area Aboriginal health services not being captured in the PBS database.<sup>1</sup>

The data item on antimicrobial dispensing included systemic and topical antibacterials and antifungals, because the resistance issues for antifungals are similar to those for antibacterials. It did not include antivirals.

# Antimicrobial medicines dispensing, all ages

## Why is it important to monitor antimicrobial use nationally?

Improving the use of antimicrobials is a national priority because of the ongoing concern about antimicrobial resistance (AMR) and because inappropriate use is exposing patients unnecessarily to the adverse effects of these medicines.

Antimicrobial-resistant microorganisms can stop an antimicrobial from working effectively. AMR is a concern because, as antimicrobials become ineffective, the ability to treat infections becomes more limited. With few new antimicrobials under development, especially for infections that occur in the community, AMR has been declared by the World Health Organization as one of the greatest threats to human and animal health, as well as to food and agriculture.<sup>2</sup> Without effective antimicrobials, there is the possibility of a post-antibiotic era when minor infections can no longer be treated. Use of antimicrobials is one of the biggest drivers of resistance in the individual and wider community – the more they are used, the more likely it is that resistance will develop. For example, an individual prescribed an antibiotic for respiratory tract infection is 2.4 times more likely to acquire bacteria resistant to that antimicrobial and carry it for up to 12 months.<sup>3</sup>

Prescribing antimicrobials inappropriately – for example, for longer than necessary – contributes to resistance and exposes patients unnecessarily to the adverse effects of these medicines.

Examining how antimicrobials are being used will help inform strategies to minimise resistance and adverse effects in patients.

Australia continues to have very high overall rates of community antimicrobial use compared with other countries. In 2015, almost half the Australian population in the community setting had at least one antimicrobial dispensed under the PBS or Repatriation Pharmaceutical Benefits Scheme (RPBS). The 11 most commonly dispensed antimicrobials made up 84% of all use, and were most often dispensed to young children, or those aged over 65 years. Use in all age groups was also higher in winter months, suggesting that they are potentially being used for respiratory tract infections. Most antimicrobial use in the Australian community is unnecessary, because they are frequently used to treat infections for which they provide little or no benefit.<sup>4,5</sup>

## What initiatives have taken place since 2015?

Increased antimicrobial use has prompted a number of policy and regulatory responses in Australia since publication of the first Atlas in 2015. Australia has taken a One Health approach, coordinating responses from all sectors that use antimicrobials. Responses have included:

- Development of Australia's First National Antimicrobial Resistance Strategy, as part of a global response to combat AMR<sup>2</sup>
- Development of the Antimicrobial Use and Resistance in Australia (AURA) Surveillance System by the Australian Commission on Safety and Quality in Health Care (the Commission) to inform strategies to prevent and contain AMR<sup>6</sup>
- Establishment of the National Alert System for Critical Antimicrobial Resistance (CARAlert) by the Commission, as part of AURA, to collect close to real-time data on critical resistances to the last-line antimicrobials<sup>6</sup>
- Establishment of the National Centre for Antimicrobial Stewardship, to promote the rational use of antimicrobials across Australia<sup>7</sup>
- Implementation of antimicrobial stewardship programs in all health service organisations across Australia, under the requirements of the National Safety and Quality Health Service Standards<sup>8</sup>
- Continued delivery of the NPS MedicineWise Resistance Fighter campaign (2012–2017) – a national initiative to help raise awareness of AMR and encourage reduction in antibiotic use where appropriate and safe to do so<sup>9</sup>
- Letters from Australia's Chief Medical Officer to general practitioners prescribing high amounts of antimicrobials, prompting audit of their antimicrobial prescribing practice to identify areas for quality improvement.<sup>10</sup>

## About the data

Data are sourced from the PBS dataset. This dataset includes all prescriptions dispensed under the PBS or the RPBS, including prescriptions that do not receive an Australian Government subsidy. Note that some dispensed medicines may not be consumed by the patient.

The dataset does not include prescriptions dispensed for patients during their hospitalisation in public hospitals, discharge prescriptions dispensed from public hospitals in New South Wales and the Australian Capital Territory, direct supply of medicines to remote Aboriginal health services, over-the-counter purchase of medicines, doctor's bag medicines and private prescriptions.

This analysis was not undertaken by Aboriginal and Torres Strait Islander status because this information was not available for PBS data at the time of publication.

Changes have been made to the data specification used in the first Atlas to improve the robustness of comparing rates over time. The main change is the addition of sex standardisation, as the data specification for the first Atlas standardised for age only. These changes have resulted in small differences in the rates reported for 2013–14 in the first Atlas and this Atlas. The rates reported in this Atlas should be used to monitor changes over time.

# Antimicrobial medicines dispensing, all ages

## What do the data show?

### Magnitude of variation\*

In 2016–17, the rate of dispensing of antimicrobial medicine prescriptions was **4.8 times as high** in the area (Statistical Area Level 3 – SA3) with the highest rate as in the SA3 with the lowest rate. The magnitude of variation **increased** from 2013–14, when there was a 4.6-fold difference between the highest and lowest rates (Figure 5.3).

### Rate of prescriptions dispensed

In 2016–17, there were 29,147,238 PBS prescriptions dispensed for antimicrobial medicines, representing an Australian rate of **115,894** prescriptions dispensed per 100,000 people of all ages. The Australian rate **decreased** from 2013–14, when 126,864 prescriptions per 100,000 people were dispensed (Figure 5.3).

### People dispensed at least one prescription

In 2016–17, there were **43,215** people per 100,000 people nationally who had at least one prescription dispensed for an antimicrobial medicine. The number of people nationally who had at least one prescription dispensed in a year **decreased** from 2013–14, when 45,411 people per 100,000 people nationally had at least one antimicrobial medicine prescription dispensed (Table 5.1).

**Table 5.1: Number of people dispensed at least one PBS prescription for an antimicrobial medicine per 100,000 people of all ages, age and sex standardised, 2013–14 to 2016–17**

	2013–14	2014–15	2015–16	2016–17
<b>Australian rate</b>	45,411	46,032	44,866	43,215

### Volume of antimicrobial medicine use

In 2016–17, there were 23.21 defined daily doses<sup>†</sup> (DDDs)<sup>†</sup> of antimicrobial medicines per 1,000 people dispensed on any given day. The national DDD rate per 1,000 people per day was relatively **stable** between 2013–14 and 2016–17 (Table 5.2).

**Table 5.2: Number of defined daily doses of antimicrobial medicines dispensed per 1,000 people of all ages per day, age and sex standardised, 2013–14 to 2016–17**

	2013–14	2014–15	2015–16	2016–17
<b>Australian rate</b>	23.55	24.16	23.64	23.21

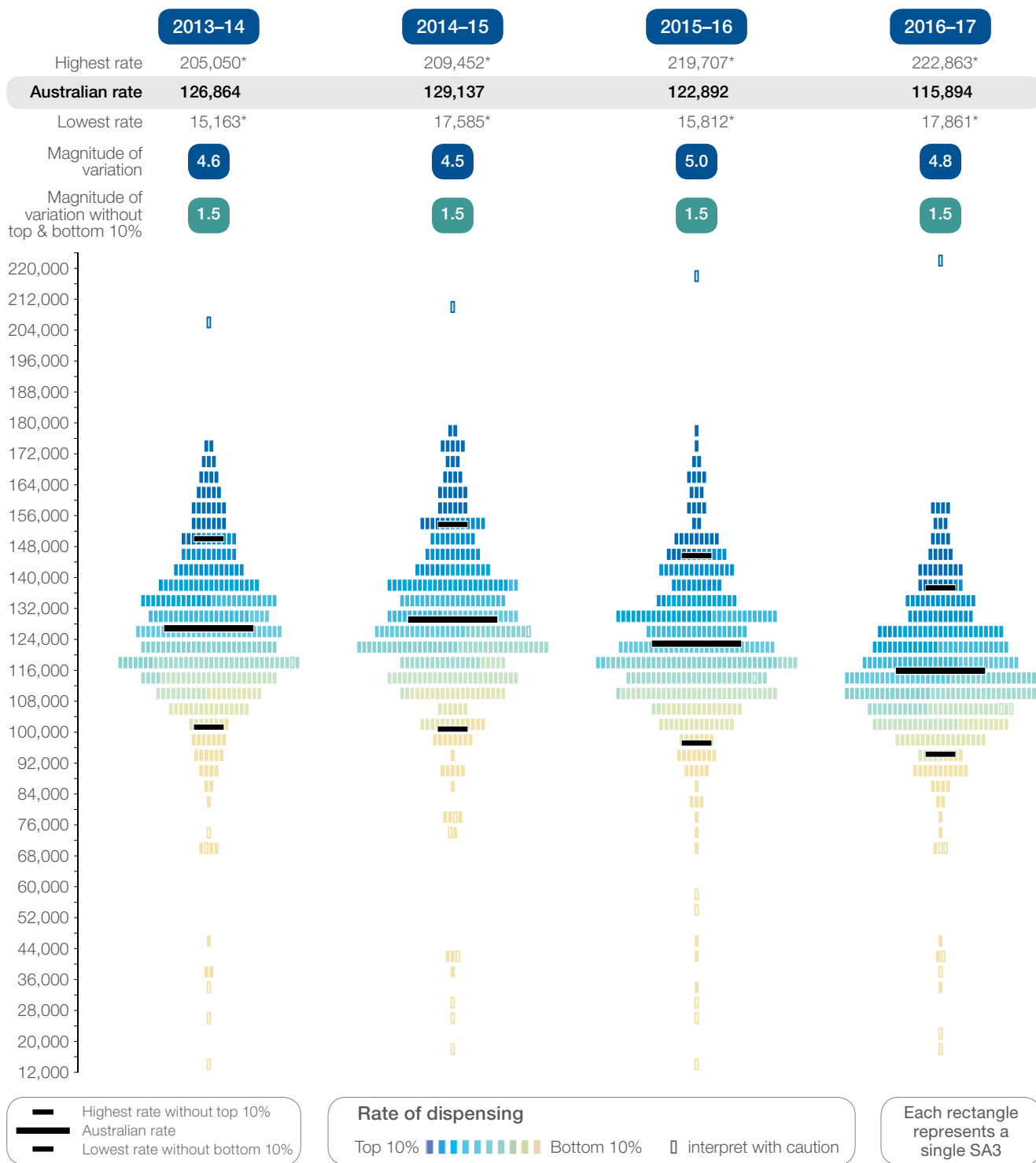
\* Some of the published SA3 rates were considered more volatile than others. These rates are excluded from the calculation of the difference between the highest and lowest SA3 rates in Australia.

† A defined daily dose (DDD) is a measure of medicines use that allows comparison between different therapeutic groups, and between countries. The DDD is based on the average dose per day of the medicine when used for its main indication by adults. Refer to the Technical Supplement for more information.



# Rates across years

Figure 5.3: Number of PBS prescriptions dispensed for antimicrobial medicines per 100,000 people of all ages, age and sex standardised, by Statistical Area Level 3 (SA3) of patient residence, 2013–14 to 2016–17



**Notes:**

Hollow rectangles (□) and asterisks (\*) indicate rates that are considered more volatile than other published rates and should be interpreted with caution. These rates are excluded from the calculation of the difference between the highest and lowest SA3 rates in Australia. For further detail about the methods used, please refer to the Technical Supplement.

**Sources:** AIHW analysis of Pharmaceutical Benefits Scheme data and ABS Estimated Resident Population 30 June 2013 to 2016.

# Antimicrobial medicines dispensing, all ages

## Interpretation

Between 2013–14 and 2016–17, the rate of antimicrobial prescriptions dispensed per 100,000 people nationally decreased by 9%, and the rate of people dispensed at least one prescription for an antimicrobial also decreased. While this is encouraging, the volume of antimicrobials used in the Australian community, as indicated by the DDD per 1,000 people per day, remained relatively stable, indicating that there was little change in the amount of antimicrobial medicines supplied during the four-year period. Further, the magnitude of variation in dispensing rates also increased, which might indicate changes in antimicrobial medicine use in some areas but not others.

Potential reasons for this pattern include:

- The number of authority prescriptions dispensed – for example, a rise in these types of prescriptions for an increased quantity supplied could lower rates of prescriptions dispensed
- Changes in guidelines and prescribing behaviours, affecting the type of antimicrobial chosen and dose dispensed (as different conditions might require courses with a different dose or the same condition may be treated with a higher dose, which will not affect the rate of prescriptions dispensed, but will affect the DDD).

To explore this, further analysis could potentially focus on:

- Types of antimicrobials, reasons for prescribing and doses being dispensed
- Quantities of antimicrobials being dispensed on authority prescriptions
- The context in which antimicrobials are dispensed – for example, in patients with chronic disease.

## Is there more to be done?

Although antimicrobial dispensing rates fell in Australia between 2013–14 and 2016–17, the findings suggest that further efforts to improve antimicrobial use are needed. The magnitude of variation in dispensing rates increased, which is unlikely to be explained by infection rates. Despite reduced dispensing rates, this has had little effect on the overall volume of antimicrobial medicines supplied on any given day in the Australian community during the four-year period. Improving antimicrobial prescribing requires a sustained, multi-pronged approach. Australia's first National Antimicrobial Resistance Strategy describes the collaborative efforts required to bring about practice change where appropriate, and to implement initiatives that support improvement in antimicrobial use in all settings of health care.<sup>2</sup>

The Commission will publish a further report of these data in 2019, including analyses by state and territory, and local area. This information will help to identify whether changes in antimicrobial use are occurring in some areas and not others, and what further targeted strategies are needed to promote safe and appropriate use of antimicrobials in Australia.

## References

1. Australian Commission on Safety and Quality in Health Care, National Health Performance Authority. Australian Atlas of Healthcare Variation. Sydney: ACSQHC; 2015.
2. Australian Government Department of Health, Australian Government Department of Agriculture and Water Resources. Australia's first national antimicrobial resistance strategy 2015–2019: progress report. Canberra: Australian Government; 2017.
3. Costelloe C, Metcalfe C, Lovering A, Mant D, Hay AD. Effect of antibiotic prescribing in primary care on antimicrobial resistance in individual patients: systematic review and meta-analysis. *BMJ* 2010;340:c2096.
4. Australian Commission on Safety and Quality in Health Care. AURA 2017: second Australian report on antimicrobial use and resistance in human health. Sydney: ACSQHC; 2017.
5. McCullough AR, Pollack AJ, Plejdrup Hansen M, Glasziou PP, Locke DF, Britt HC, et al. Antibiotics for acute respiratory infections in general practice: comparison of prescribing rates with guideline recommendations. *Med J Aust* 2017;207(2):65–9. Epub 2017/07/14.
6. Australian Commission on Safety and Quality in Health Care. Antimicrobial use and resistance in Australia [Internet]. Sydney: ACSQHC; 2018 [cited Sep 2018]. Available from: [www.safetyandquality.gov.au/antimicrobial-use-and-resistance-in-australia/](http://www.safetyandquality.gov.au/antimicrobial-use-and-resistance-in-australia/)
7. Doherty Institute. National centre for antimicrobial stewardship [Internet]. Melbourne: Melbourne Health; 2018 [cited 2018 Sep]. Available from: [www.ncas-australia.org/](http://www.ncas-australia.org/)
8. Australian Commission on Safety and Quality in Health Care. Assessment to the NSQHS Standards [Internet]. Sydney: ACSQHC; 2018 [cited 2018 Sep]. Available from: [www.safetyandquality.gov.au/our-work/assessment-to-the-nsqhs-standards/](http://www.safetyandquality.gov.au/our-work/assessment-to-the-nsqhs-standards/)
9. NPS MedicineWise. Reducing antibiotic resistance [Internet]. Sydney: NPS MedicineWise; 2018 [cited 2018 Sep]. Available from: [www.nps.org.au/medical-info/clinical-topics/reducing-antibiotic-resistance](http://www.nps.org.au/medical-info/clinical-topics/reducing-antibiotic-resistance)
10. Australian Government Department of Health, Australian Government Department of the Prime Minister and Cabinet. Nudge vs superbugs: a behavioural economics trial to reduce the overprescribing of antibiotics. Canberra: Department of Health, and Department of the Prime Minister and Cabinet; 2018. [www.health.gov.au/internet/main/publishing.nsf/Content/Nudge-vs-Superbugs-behavioural-economics-trial-to-reduce-overprescribing-antibiotics-June-2018](http://www.health.gov.au/internet/main/publishing.nsf/Content/Nudge-vs-Superbugs-behavioural-economics-trial-to-reduce-overprescribing-antibiotics-June-2018) (accessed Sep 2018).



## 5.2 Amoxicillin and amoxicillin–clavulanate dispensing, all ages

### Context

This section examines amoxicillin and amoxicillin–clavulanate dispensing in Australia between 2013–14 and 2016–17 for people of all ages.

Antimicrobial medicines are used to treat microbial infections. They include antibiotics (or antibacterials), antivirals and antifungals. Use is often driven by factors such as physician experience, patient factors, the incidence of infection, and the prevalence of antimicrobial resistance.<sup>1</sup>

Amoxicillin is an antibiotic, and is the most frequently prescribed antimicrobial in the community. In 2013, amoxicillin accounted for 21% of systemic antimicrobial dispensing, with repeat dispensing ordered on 40% of prescriptions.<sup>2</sup> Amoxicillin is preferred for treating infections that are less likely to be caused by  $\beta$ -lactamase-producing bacteria, such as most upper and lower bacterial respiratory tract infections.<sup>3</sup>

The addition of clavulanic acid, a  $\beta$ -lactamase inhibitor, to amoxicillin broadens its spectrum of activity to include bacteria that commonly harbour acquired  $\beta$ -lactamases, such as *Escherichia coli*, *Klebsiella* species and *Staphylococcus aureus*.<sup>3</sup> The combination of amoxicillin–clavulanate is the third most commonly prescribed antimicrobial in the community.<sup>2</sup> Because antimicrobial resistance is known to be increasing in Australia, amoxicillin–clavulanate is preferred over amoxicillin for treating urinary tract infections.<sup>1,3</sup>

The rate of amoxicillin and amoxicillin–clavulanate dispensing per 100,000 people in all age groups was mapped in the first *Australian Atlas of Healthcare Variation*, published in November 2015.<sup>1</sup> The first Atlas reported that, combined, these two antimicrobials accounted for more than 10 million Pharmaceutical Benefits Scheme (PBS) prescriptions dispensed in 2013–14; nearly 5.7 million were for amoxicillin and nearly 4.7 million were for amoxicillin–clavulanate.<sup>1</sup>

# Amoxicillin and amoxicillin–clavulanate dispensing, all ages

As with dispensing for all antimicrobials, rates of amoxicillin and amoxicillin–clavulanate dispensing tended to be higher in areas with socioeconomic disadvantage. This is consistent with poorer health outcomes and higher infection rates observed in areas with socioeconomic disadvantage. Dispensing rates were lower in areas with socioeconomic advantage, as well as in remote communities. Low dispensing rates in remote communities were partly attributed to medicines dispensed by remote-area Aboriginal health services not being captured in the PBS database.<sup>1</sup>

## Why is it important to monitor antimicrobial use nationally?

Improving the use of antimicrobials is a national priority because of the ongoing concern about antimicrobial resistance (AMR) and because inappropriate use is exposing patients unnecessarily to the adverse effects of these medicines.

Antimicrobial-resistant microorganisms can stop an antimicrobial from working effectively. AMR is a concern because, as antimicrobials become ineffective, the ability to treat infections becomes more limited. With few new antimicrobials under development, especially for infections that occur in the community, AMR has been declared by the World Health Organization as one of the greatest threats to human and animal health, as well as food and agriculture.<sup>4</sup> Without effective antimicrobials, there is the possibility of a post-antibiotic era when minor infections can no longer be treated. Use of antimicrobials is one of the biggest drivers of resistance in the individual and wider community – the more they are used, the more likely it is that resistance will develop. For example, an individual prescribed an antibiotic for respiratory tract infection is 2.4 times more likely to acquire a bacterium resistant to that antimicrobial and carry it for up to 12 months.<sup>5</sup>

Prescribing antimicrobials inappropriately – for example, for longer than necessary – contributes to resistance and exposes patients unnecessarily to the adverse effects of these medicines. Examining how antimicrobials are being used will help inform strategies to minimise resistance and adverse effects in patients.

Australia continues to have very high overall rates of amoxicillin and amoxicillin–clavulanate use in the community compared with other countries, and misuse is common. For example, amoxicillin–clavulanate, which is the third most commonly dispensed antimicrobial in the community, should only be prescribed for infections where resistance to amoxicillin is suspected or proven. In 2017, the second Australian report on antimicrobial use and resistance in human health reported data obtained from the NPS MedicineWise MedicineInsight program. It showed that 14% of amoxicillin–clavulanate prescriptions were for upper respiratory tract infections, where antimicrobials are not needed, and 15% of prescriptions were for sinusitis, where antimicrobials are only needed in certain circumstances (with amoxicillin being the recommended medicine).<sup>3,6</sup>

## What initiatives have taken place since 2015?

Increased antimicrobial use and misuse has prompted a number of policy and regulatory responses in Australia since publication of the first Atlas in 2015. Australia has taken a One Health approach, coordinating responses from all sectors that use antimicrobials. Responses have included:

- Development of Australia's First National Antimicrobial Resistance Strategy, as part of a global response to combat AMR<sup>4</sup>
- Development of the Antimicrobial Use and Resistance in Australia (AURA) Surveillance System by the Australian Commission on Safety and Quality in Health Care (the Commission) to inform strategies to prevent and contain AMR<sup>7</sup>
- Establishment of the National Alert System for Critical Antimicrobial Resistance (CARAlert) by the Commission, as part of AURA, to collect close to real-time data on critical resistances to the last-line antimicrobials<sup>7</sup>
- Establishment of the National Centre for Antimicrobial Stewardship, to promote the rational use of antimicrobials across Australia<sup>8</sup>
- Implementation of antimicrobial stewardship programs in all health service organisations across Australia, under the requirements of the National Safety and Quality Health Service Standards<sup>9</sup>
- Continued delivery of the NPS MedicineWise Resistance Fighter campaign (2012–2017) – a national initiative to help raise awareness of antibiotic resistance and encourage reduction in antibiotic use where appropriate and safe to do so<sup>10</sup>
- Letters from Australia's Chief Medical Officer to general practitioners prescribing high amounts of antimicrobials, prompting audit of their antimicrobial prescribing practice to identify areas for quality improvement.<sup>11</sup>

## About the data

Data are sourced from the PBS dataset. This dataset includes all prescriptions dispensed under the PBS or the Repatriation Pharmaceutical Benefits Scheme, including prescriptions that do not receive an Australian Government subsidy. Note that some dispensed medicines may not be consumed by the patient.

The dataset does not include prescriptions dispensed for patients during their admission to public hospitals, discharge prescriptions dispensed from public hospitals in New South Wales and the Australian Capital Territory, direct supply of medicines to remote Aboriginal health services, over-the-counter purchase of medicines, doctor's bag medicines and private prescriptions.

This analysis was not undertaken by Aboriginal and Torres Strait Islander status because this information was not available for PBS data at the time of publication.

Changes have been made to the data specification used in the first Atlas to improve the robustness of comparing rates over time. The main change is the addition of sex standardisation, as the data specification for the first Atlas standardised for age only. These changes have resulted in small differences in the rates reported for 2013–14 in the first Atlas and this Atlas. The rates reported in this Atlas should be used to monitor changes over time.

# Amoxicillin and amoxicillin–clavulanate dispensing, all ages

## What do the data show?

### Magnitude of variation\*

In 2016–17, the rate of dispensing of amoxicillin prescriptions was **7.6 times as high** in the area (Statistical Area Level 3 – SA3) with the highest rate as in the SA3 with the lowest rate. The magnitude of variation was stable from 2013–14, then **decreased** from 2015–16 when there was a 7.9-fold difference between the highest and lowest rates (Figure 5.4).

The rate of dispensing of amoxicillin–clavulanate prescriptions was **5.8 times as high** in the SA3 with the highest rate as in the SA3 with the lowest rate 2016–17. The magnitude of variation **increased** from 2013–14, when there was a 5.0-fold difference between the highest and lowest rates (Figure 5.9).

### Rate of prescriptions dispensed

In 2016–17, there were 5,443,251 PBS prescriptions dispensed for amoxicillin, representing an Australian rate of **22,286** prescriptions dispensed per 100,000 people of all ages. The Australian rate **decreased** from 2013–14, when 24,112 prescriptions per 100,000 people were dispensed. (Figure 5.4)

In 2016–17, there were 4,936,412 PBS prescriptions dispensed for amoxicillin–clavulanate, representing an Australian rate of **19,567** prescriptions dispensed per 100,000 people of all ages. The Australian rate **increased** from 2013–14, when 19,110 prescriptions per 100,000 people were dispensed (Figure 5.9).

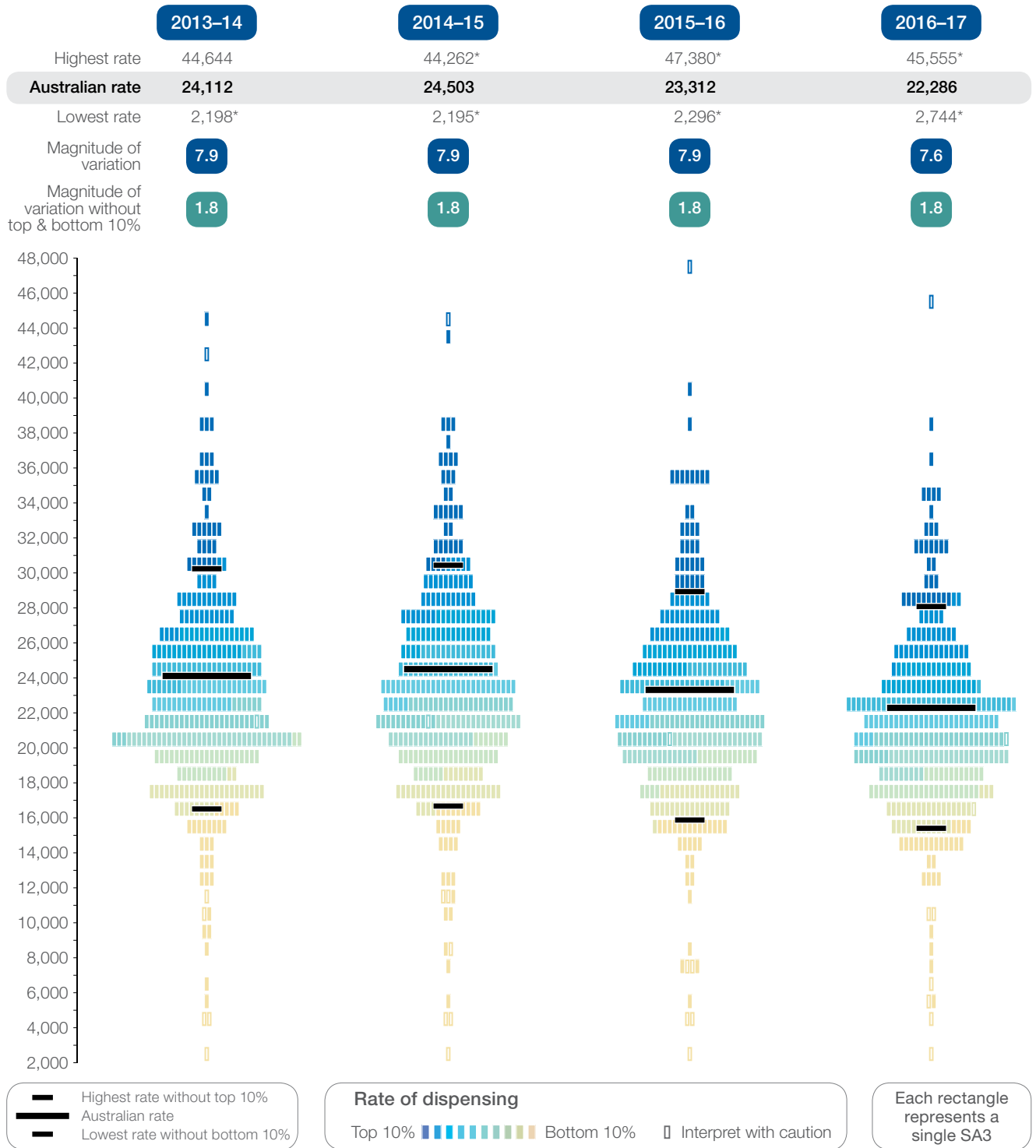
\* Some of the published SA3 rates were considered more volatile than others. These rates are excluded from the calculation of the difference between the highest and lowest SA3 rates in Australia.



# Amoxicillin dispensing, all ages

## Rates across years

Figure 5.4: Number of PBS prescriptions dispensed for amoxicillin per 100,000 people of all ages, age and sex standardised, by Statistical Area Level 3 (SA3) of patient residence, 2013–14 to 2016–17



**Notes:**  
Hollow rectangles (□) and asterisks (\*) indicate rates that are considered more volatile than other published rates and should be interpreted with caution. These rates are excluded from the calculation of the difference between the highest and lowest SA3 rates in Australia. For further detail about the methods used, please refer to the Technical Supplement.  
**Sources:** AIHW analysis of Pharmaceutical Benefits Scheme data and ABS Estimated Resident Population 30 June 2013 to 2016.

# Amoxicillin and amoxicillin–clavulanate dispensing, all ages

## People dispensed at least one prescription

In 2016–17, there were **15,143** people per 100,000 people nationally who had at least one prescription dispensed for amoxicillin. The number of people nationally who had at least one prescription dispensed in a year **decreased** from 2013–14, when 15,890 people per 100,000 people nationally had at least one amoxicillin prescription dispensed (Table 5.5).

**Table 5.5: Number of people dispensed at least one PBS prescription for amoxicillin per 100,000 people of all ages, age and sex standardised, 2013–14 to 2016–17**

	2013–14	2014–15	2015–16	2016–17
Australian rate	15,890	16,205	15,733	15,143

In 2016–17, there were **10,683** people per 100,000 people nationally who had at least one prescription dispensed for amoxicillin–clavulanate. The number of people nationally who had at least one prescription dispensed in a year **increased** from 2013–14, when 10,338 people per 100,000 people nationally had at least one amoxicillin–clavulanate prescription dispensed (Table 5.6).

**Table 5.6: Number of people dispensed at least one PBS prescription for amoxicillin–clavulanate per 100,000 people of all ages, age and sex standardised, 2013–14 to 2016–17**

	2013–14	2014–15	2015–16	2016–17
Australian rate	10,338	10,996	10,849	10,683

## Volume of amoxicillin and amoxicillin–clavulanate use

In 2016–17, there were 5.12 defined daily doses<sup>†</sup> (DDDs) of amoxicillin per 1,000 people dispensed on any given day. The national DDD rate per 1,000 people per day **fell** from 2013–14, when it was 5.33 (Table 5.7).

**Table 5.7: Number of defined daily doses of amoxicillin dispensed per 1,000 people of all ages per day, age and sex standardised, 2013–14 to 2016–17**

	2013–14	2014–15	2015–16	2016–17
Australian rate	5.33	5.47	5.27	5.12

In 2016–17, there were 4.31 DDDs of amoxicillin–clavulanate per 1,000 people dispensed on any given day. The national DDD per 1,000 people per day **increased** from 2013–14, when it was 4.17 (Table 5.8).

**Table 5.8: Number of defined daily doses of amoxicillin–clavulanate dispensed per 1,000 people of all ages per day, age and sex standardised, 2013–14 to 2016–17**

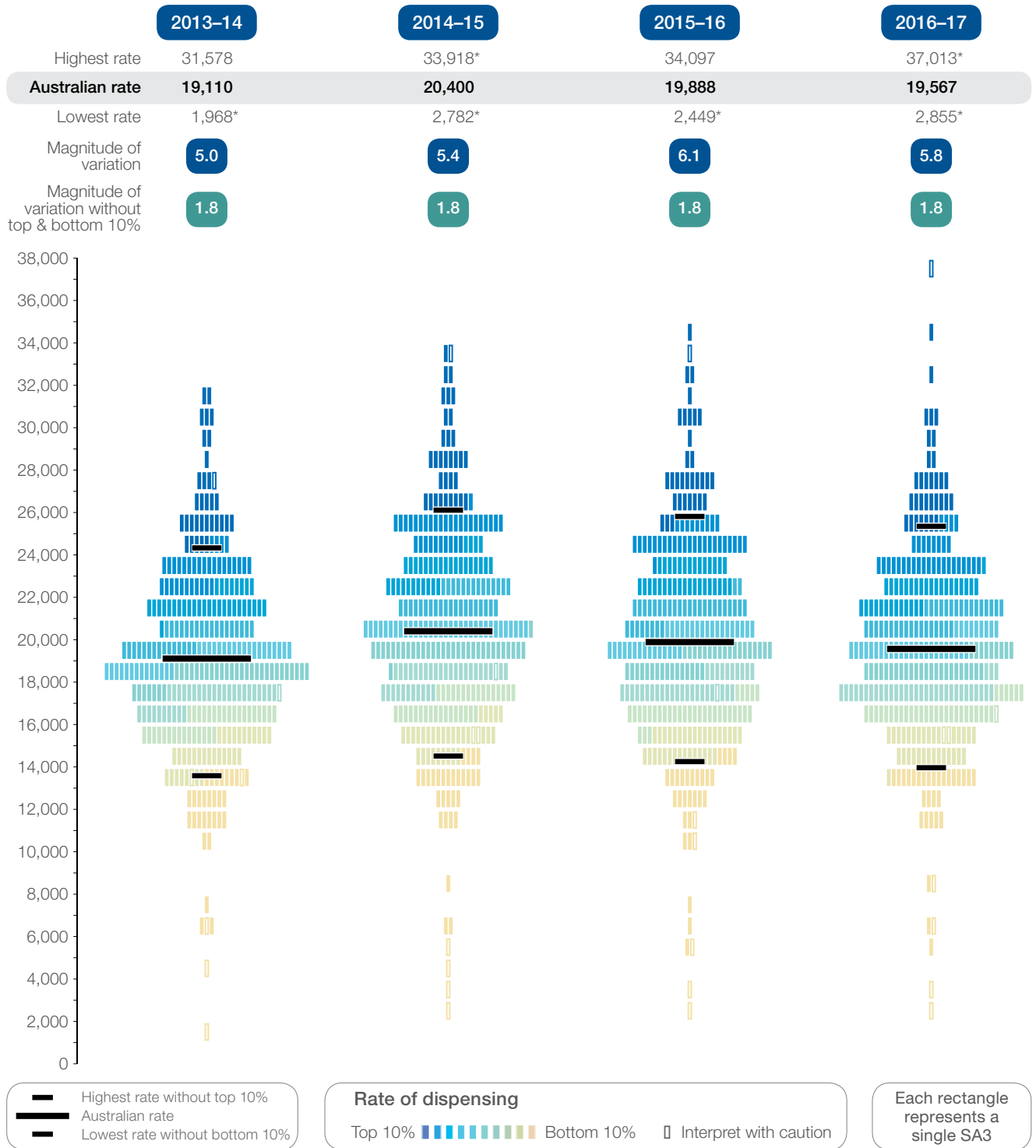
	2013–14	2014–15	2015–16	2016–17
Australian rate	4.17	4.46	4.36	4.31

<sup>†</sup> A defined daily dose (DDD) is a measure of medicines use that allows comparison between different therapeutic groups, and between countries. The DDD is based on the average dose per day of the medicine when used for its main indication by adults. Refer to the Technical Supplement for more information.

# Amoxicillin–clavulanate dispensing, all ages

## Rates across years

Figure 5.9: Number of PBS prescriptions dispensed for amoxicillin–clavulanate per 100,000 people of all ages, age and sex standardised, by Statistical Area Level 3 (SA3) of patient residence, 2013–14 to 2016–17



**Notes:**

Hollow rectangles (□) and asterisks (\*) indicate rates that are considered more volatile than other published rates and should be interpreted with caution. These rates are excluded from the calculation of the difference between the highest and lowest SA3 rates in Australia. For further detail about the methods used, please refer to the Technical Supplement.

**Sources:** AIHW analysis of Pharmaceutical Benefits Scheme data and ABS Estimated Resident Population 30 June 2013 to 2016.

# Amoxicillin and amoxicillin–clavulanate dispensing, all ages

## Interpretation

Between 2013–14 and 2016–17, the rate of amoxicillin prescriptions dispensed per 100,000 people nationally decreased by 7.6%, and the rate of people dispensed at least one prescription for amoxicillin also decreased. In contrast, the rate of amoxicillin–clavulanate prescriptions dispensed per 100,000 people nationally increased by 2.4%. Collectively, the volume of both medicines used in the Australian community, as indicated by the DDDs per 1,000 people per day, has remained relatively stable, indicating that there has been little change in the amount of either of these antimicrobials supplied during the four-year period. The magnitude of variation in dispensing decreased for amoxicillin, but increased for amoxicillin–clavulanate. It is unclear whether these patterns indicate changes in some areas and not others.

Potential reasons for these patterns include:

- The number of authority prescriptions dispensed – for example, a rise in these types of prescriptions for an increased quantity supplied could lower rates of prescriptions dispensed
- Changes in guidelines and prescribing behaviours, affecting the choice of amoxicillin or amoxicillin–clavulanate and dose dispensed (as different conditions might require courses with a different dose or the same condition may be treated with a higher dose, which will not affect the rate of prescriptions dispensed, but will affect the DDD).

To explore this, further analysis could potentially focus on:

- Reasons for prescribing and doses being dispensed
- Quantities being dispensed on authority prescriptions
- The context in which these antibiotics are being prescribed and whether it is in accordance with guidelines.

## Is there more to be done?

Although amoxicillin dispensing rates fell in Australia between 2013–14 and 2016–17, rates for amoxicillin–clavulanate dispensing did not. The magnitude of variation in dispensing rates decreased for amoxicillin and increased for amoxicillin–clavulanate, which is unlikely to be explained by infection rates. Australia still has high volumes of use of both amoxicillin and amoxicillin–clavulanate. Further investigation is required to identify whether these patterns are warranted. Improving prescribing of these antimicrobials requires a sustained, multi-pronged approach. Australia's first National Antimicrobial Resistance Strategy describes the collaborative efforts required to bring about practice change where appropriate, and to implement initiatives that support improvement in use in all settings of health care.<sup>4</sup>

The Commission will publish a further analysis of these data in 2019, including analyses by state and territory, and local area. This information will help to identify whether changes in the use of these antimicrobials are occurring in some areas and not others, and what further targeted strategies are needed to promote safe and appropriate use of these medicines in Australia.

## References

1. Australian Commission on Safety and Quality in Health Care, National Health Performance Authority. Australian Atlas of Healthcare Variation. Sydney: ACSQHC; 2015.
2. Drug Utilisation Sub-Committee. Antibiotics: PBS/RPBS utilisation. Pharmaceutical Benefits Scheme October 2014 and February 2015.
3. Therapeutic guidelines: antibiotic. Version 15. Melbourne: Therapeutic Guidelines Limited; 2014.
4. Australian Government Department of Health, Australian Government Department of Agriculture and Water Resources. Australia's first national antimicrobial resistance strategy 2015–2019: progress report. Canberra: Australian Government; 2017.
5. Costelloe C, Metcalfe C, Lovering A, Mant D, Hay AD. Effect of antibiotic prescribing in primary care on antimicrobial resistance in individual patients: systematic review and meta-analysis. *BMJ* 2010;340:c2096.
6. Australian Commission on Safety and Quality in Health Care. AURA 2017: second Australian report on antimicrobial use and resistance in human health. Sydney: ACSQHC; 2017.
7. Australian Commission on Safety and Quality in Health Care. Antimicrobial use and resistance in Australia [Internet]. Sydney: ACSQHC; 2018 [cited 2018 Sep]. Available from: [www.safetyandquality.gov.au/antimicrobial-use-and-resistance-in-australia/](http://www.safetyandquality.gov.au/antimicrobial-use-and-resistance-in-australia/)
8. Doherty Institute. National Centre for Antimicrobial Stewardship [Internet]. Melbourne: Melbourne Health; 2018 [cited 2018 Sep]. Available from: [www.ncas-australia.org/](http://www.ncas-australia.org/)
9. Australian Commission on Safety and Quality in Health Care. Assessment to the NSQHS Standards [Internet]. Sydney: ACSQHC; 2018 [cited 2018 Sep]. Available from: [www.safetyandquality.gov.au/our-work/assessment-to-the-nsqhs-standards/](http://www.safetyandquality.gov.au/our-work/assessment-to-the-nsqhs-standards/)
10. NPS MedicineWise. Reducing antibiotic resistance [Internet]. Sydney: NPS MedicineWise; 2018 [cited 2018 Sep]. Available from: [www.nps.org.au/medical-info/clinical-topics/reducing-antibiotic-resistance](http://www.nps.org.au/medical-info/clinical-topics/reducing-antibiotic-resistance)
11. Australian Government Department of Health, Australian Government Department of the Prime Minister and Cabinet. Nudge vs superbugs: a behavioural economics trial to reduce the overprescribing of antibiotics. Canberra: Department of Health, and Department of the Prime Minister and Cabinet; 2018. [www.health.gov.au/internet/main/publishing.nsf/Content/Nudge-vs-Superbugs-behavioural-economics-trial-to-reduce-overprescribing-antibiotics-June-2018](http://www.health.gov.au/internet/main/publishing.nsf/Content/Nudge-vs-Superbugs-behavioural-economics-trial-to-reduce-overprescribing-antibiotics-June-2018) (accessed Sep 2018).



## 5.4 Antipsychotic medicines dispensing, 18–64 years

### Context

This section examines antipsychotic medicines dispensing for people aged 18–64 years between 2013–14 and 2016–17.

Antipsychotic medicines are used to manage psychotic disorders such as schizophrenia, and the psychotic symptoms of mood disorders. In adults, antipsychotic medicines are commonly used to reduce or sometimes eliminate the distressing and disabling symptoms of psychosis, such as paranoia, confused thinking, delusions and hallucinations.

Effective treatment of schizophrenia and related disorders usually includes ongoing clinical support in the community and psychological therapy, including education about symptoms and how to manage them, psychosocial rehabilitation, assistance with accommodation and employment, and educational support. Antipsychotic medicines are considered to be just one component of treating mental health conditions and rarely considered sufficient when used on their own.<sup>1</sup>

The rate of antipsychotic medicines dispensing per 100,000 people aged 18–64 years was mapped in the first *Australian Atlas of Healthcare Variation*, published in November 2015. The first Atlas reported that, in 2013–14, just over 2.5 million Pharmaceutical Benefits Scheme (PBS) prescriptions for antipsychotic medicines were dispensed in Australia to people aged 18–64 years. Dispensing rates were lower than for people aged 65 years and over. Rates were similar in major cities and regional areas, but higher rates were observed in areas with socioeconomic disadvantage. Dispensing rates were lower in remote communities, which was partly attributed to medicines dispensed by remote-area Aboriginal health services not being captured in the PBS database.<sup>1</sup>

# Antipsychotic medicines dispensing, 18–64 years

## Why is it important to monitor antipsychotic medicines use nationally?

Improving use of antipsychotic medicines in this age group is of national importance because of the wide variation in use across Australia. Of particular concern is that these medicines are being inappropriately prescribed to manage sleep disorders, which is outside their approved indication for use.<sup>1–3</sup>

## What initiatives have taken place since 2015?

Since 2015, initiatives to improve use of antipsychotic medicines in people aged 18–64 years have been undertaken as part of a wider strategy to improve the management of mental health conditions in Australia. The National Mental Health Commission, which was established in 2012, continues to provide advice on ways to improve Australia's mental health and acts as a catalyst for change.<sup>4</sup> In 2016, the Australian Bureau of Statistics published *Patterns of Use of Mental Health Services and Prescription Medications, 2011*.<sup>5</sup> Regulatory changes have also been made to the number of repeat supplies that can be ordered on prescriptions for low-dose quetiapine.

## About the data

Data are sourced from the PBS dataset. This dataset includes all prescriptions dispensed under the PBS or the Repatriation Pharmaceutical Benefits Scheme, including prescriptions that do not receive an Australian Government subsidy. Note that some dispensed medicines may not be consumed by the patient.

The dataset does not include prescriptions dispensed for patients during their hospitalisation in public hospitals, discharge prescriptions dispensed from public hospitals in New South Wales and the Australian Capital Territory, direct supply of medicines to remote Aboriginal health services, over-the-counter purchase of medicines, doctor's bag medicines and private prescriptions.

The PBS data do not include prescriptions for clozapine dispensed by public hospitals and claimed through offline arrangements up to 2014–15. The Technical Supplement has further details about clozapine prescriptions.

This analysis was not undertaken by Aboriginal and Torres Strait Islander status because this information was not available for PBS data at the time of publication.

Changes have been made to the data specification used in the first Atlas to improve the robustness of comparing rates over time. The main change is the addition of sex standardisation, as the data specification for the first Atlas standardised for age only. These changes have resulted in small differences in the rates reported for 2013–14 in the first Atlas and this Atlas. The rates reported in this Atlas should be used to monitor changes over time.

## What do the data show?

### Magnitude of variation\*

In 2016–17, the rate of dispensing of antipsychotic medicine prescriptions in people aged 18–64 years was **14.1 times as high** in the area (Statistical Area Level 3 – SA3) with the highest rate as in the SA3 with the lowest rate. The magnitude of variation **decreased** from 2013–14, when there was an 18.5-fold difference between the highest and lowest rates (Figure 5.13).

### Rate of prescriptions dispensed

In 2016–17, there were 2,908,555 PBS prescriptions dispensed for antipsychotic medicines to people aged 18–64 years, representing an Australian rate of **19,420** prescriptions dispensed per 100,000 people aged 18–64 years. The Australian rate **increased** during the four years from 2013–14, when 17,873 prescriptions per 100,000 people were dispensed (Figure 5.13).

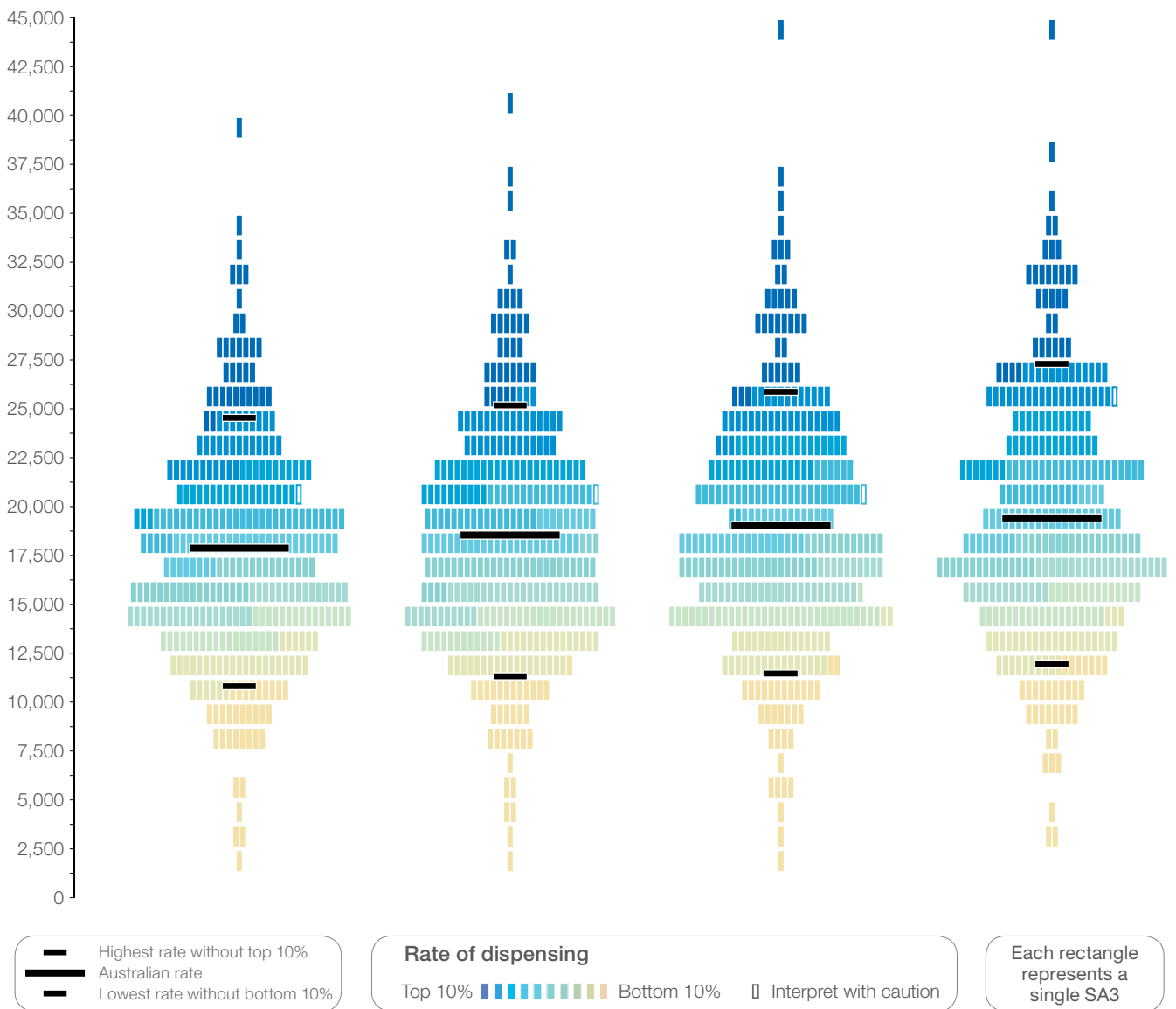
\* Some of the published SA3 rates were considered more volatile than others. These rates are excluded from the calculation of the difference between the highest and lowest SA3 rates in Australia.



# Rates across years

Figure 5.13: Number of PBS prescriptions dispensed for antipsychotic medicines per 100,000 people aged 18–64 years, age and sex standardised, by Statistical Area Level 3 (SA3) of patient residence, 2013–14 to 2016–17

	2013–14	2014–15	2015–16	2016–17
Highest rate	39,283	41,104	43,795	44,085
<b>Australian rate</b>	<b>17,873</b>	<b>18,544</b>	<b>19,032</b>	<b>19,420</b>
Lowest rate	2,126	2,006	2,297	3,124
Magnitude of variation	18.5	20.5	19.1	14.1
Magnitude of variation without top & bottom 10%	2.3	2.2	2.3	2.3



**Notes:**

Hollow rectangles (□) indicate rates that are considered more volatile than other published rates and should be interpreted with caution. These rates are excluded from the calculation of the difference between the highest and lowest SA3 rates in Australia. For further detail about the methods used, please refer to the Technical Supplement.

**Sources:** AIHW analysis of Pharmaceutical Benefits Scheme data and ABS Estimated Resident Population 30 June 2013 to 2016.

# Antipsychotic medicines dispensing, 18–64 years

## People dispensed at least one prescription

In 2016–17, there were **2,074** people per 100,000 people aged 18–64 years nationally who had at least one prescription dispensed for an antipsychotic medicine. The number of people who had at least one prescription dispensed in a year **increased** during the four years from 2013–14, when 1,975 people per 100,000 people nationally had at least one antipsychotic medicine prescription dispensed (Table 5.14).

**Table 5.14: Number of people dispensed at least one PBS prescription for an antipsychotic medicine per 100,000 people aged 18–64 years, age and sex standardised, 2013–14 to 2016–17**

	2013–14	2014–15	2015–16	2016–17
<b>Australian rate</b>	1,975	2,006	2,046	2,074

## Estimated proportion of population treated daily with antipsychotic medicines

In 2016–17, there were 15.23 defined daily doses<sup>†</sup> (DDDs) of antipsychotic medicines per 1,000 people aged 18–64 years dispensed on any given day – this is equivalent to 1.5% of the population receiving an antipsychotic medicine each day in that year. The national DDD rate per 1,000 people per day **increased** during the four years from 2013–14, when it was 14.06 (Table 5.15).

**Table 5.15: Number of defined daily doses of antipsychotic medicines dispensed per 1,000 people aged 18–64 years per day, age and sex standardised, 2013–14 to 2016–17**

	2013–14	2014–15	2015–16	2016–17
<b>Australian rate</b>	14.06	14.71	15.02	15.23

<sup>†</sup> A defined daily dose (DDD) is a measure of medicines use that allows comparison between different therapeutic groups, and between countries. The DDD is based on the average dose per day of the medicine when used for its main indication by adults. Refer to the Technical Supplement for more information.

## Interpretation

Between 2013–14 and 2016–17, the rate of antipsychotic medicines dispensed per 100,000 people aged 18–64 years increased by 9% in Australia during the four-year period. The magnitude of variation in dispensing rates decreased from 2013–14, but was still high in 2016–17. The rate of people dispensed at least one prescription increased. The volume of antipsychotic medicines used in the Australian community in this age group, as indicated by the DDD per 1,000 people per day, increased, indicating that the overall amount of antipsychotic medicines supplied to people in this age group increased during the four-year period.

Potential reasons for this pattern include:

- The prevalence of mental health conditions in this age group
- The number of people in this age group seeking care
- Use in conditions other than psychosis
- Prescribing indications and behaviours, affecting the type of antipsychotic medicine chosen and dose dispensed (as doses for different indications will affect the DDD)
- Access to psychosocial interventions, mental health services, or psychiatric and psychological services.

To explore this, further analysis could potentially focus on:

- Types of antipsychotic medicines, reasons for prescribing and doses being prescribed
- Dispensing rates based on practitioner type to determine whether there is variation in prescribing between primary care and specialist care providers (currently under analysis by the Australian Commission on Safety and Quality in Health Care – the Commission)
- Dispensing rates excluding low-dose quetiapine, given concerns about its non-approved use as a sedative.

## Is there more to be done?

Dispensing rates and the volume of antipsychotic medicines in the community on any given day in people aged 18–64 years continued to increase during the four years from 2013–14. It is unclear whether this reflects increased incidence of mental health conditions and diagnosis, improved access to medicines, or increased inappropriate use. Although variation in the magnitude of dispensing of antipsychotic medicines has fallen since 2013–14, it is still high. Further investigation is required to identify whether these patterns are unwarranted, and what ongoing vigilance is needed to promote safe and appropriate use of these medicines.

The Commission will publish a further analysis of these data in 2019, including analyses by state and territory, and local area; and an analysis by practitioner type. This information will help to identify what further targeted interventions are needed to improve the use of antipsychotic medicines.

# Antipsychotic medicines dispensing, 18–64 years

## References

1. Australian Commission on Safety and Quality in Health Care, National Health Performance Authority. Australian Atlas of Healthcare Variation. Sydney: ACSQHC; 2015.
2. Brett J. Concerns about quetiapine. *Aust Prescr* 2015;38:95–7.
3. Kjosavik SR, Gillam MH, Roughead EE. Average duration of treatment with antipsychotics among concession card holders in Australia. *Aust NZ J Psychiatry*. 2017;51(7):719–26. Epub 2017/02/15.
4. Australian Government National Mental Health Commission [Internet]. Canberra: Australian Government; 2014 [cited 2018 Oct]. Available from: [www.mentalhealthcommission.gov.au/](http://www.mentalhealthcommission.gov.au/)
5. Australian Bureau of Statistics. Patterns of use of mental health services and prescription medications, 2011. Canberra: Australian Government; 2016. [www.abs.gov.au/ausstats/abs@.nsf/mf/4329.0.00.003](http://www.abs.gov.au/ausstats/abs@.nsf/mf/4329.0.00.003) (accessed Sep 2018).

## 5.3 Antipsychotic medicines dispensing, 17 years and under

### Context

This section examines antipsychotic medicines dispensing for children and adolescents aged 17 years and under between 2013–14 and 2016–17.

Antipsychotic medicines are primarily used to manage psychotic disorders such as schizophrenia, and the psychotic symptoms of mood disorders. They are used to reduce or sometimes eliminate the distressing and disabling symptoms of psychosis, such as paranoia, confused thinking, delusions and hallucinations. In adolescents, this is the most common use of these medicines.

In children and some adolescents, antipsychotic medicines are also used to treat a range of behavioural disturbances related to developmental and behavioural conditions, including autism spectrum disorder, attention deficit hyperactivity disorder and conduct disorder.

Effective management of psychosis and behavioural disorders usually includes ongoing clinical support in the community and psychological therapy, including family therapy, education about symptoms and how to manage them, assistance with accommodation and employment, and educational support. Antipsychotic medicines are considered to be just one component of treating mental health conditions and rarely considered sufficient when used on their own.<sup>1</sup>

The rate of antipsychotic medicines dispensing per 100,000 people aged 17 years and under was mapped in the first *Australian Atlas of Healthcare Variation*, published in November 2015.<sup>1</sup> The first Atlas reported that, in 2013–14, nearly 105,000 Pharmaceutical Benefits Scheme (PBS) prescriptions for antipsychotic medicines were dispensed in Australia to people aged 17 years and under. Variation was marked, with a 22.5-fold difference in rates of dispensing between local areas. Dispensing rates were similar in major cities and regional areas, and lowest in remote communities. Socioeconomic groupings had a small association with dispensing rates. Lower rates of dispensing of antipsychotic medicines in remote communities were partly attributed to medicines dispensed by remote-area Aboriginal health services not being captured in the PBS database.<sup>1</sup>

# Antipsychotic medicines dispensing, 17 years and under

## Why is it important to monitor antipsychotic medicines use nationally?

Antipsychotic medicines can cause long-term harm, even at low doses. It is therefore essential that these medicines are prescribed appropriately in young people to ensure that their benefits outweigh the risks. Use of antipsychotic medicines for non-approved indications, such as acute sedation in the absence of psychotic symptoms, is a particular concern.<sup>2,3</sup>

## What initiatives have taken place since 2015?

Since 2015, initiatives to improve use of antipsychotic medicines in people aged 17 years and under have been undertaken as part of a wider strategy to improve the management of mental health conditions in Australia. The National Mental Health Commission, which was established in 2012, continues to provide advice on ways to improve Australia's mental health and acts as a catalyst for change.<sup>4</sup> In 2016, the Australian Bureau of Statistics published *Patterns of Use of Mental Health Services and Prescription Medications, 2011*.<sup>5</sup>

Updated guidelines from the Royal Australian and New Zealand College of Psychiatrists – *Professional Practice Guideline 7: Guidance for psychotropic medication use in children and adolescents* (2015) – were also published.<sup>6</sup> Mental health organisations such as Beyond Blue and the Black Dog Institute provide support to all people across Australia, including children and adolescents, who are living with a mental health condition. Other programs such as Headspace have been developed to specifically focus on supporting youth mental health.

## About the data

Data are sourced from the PBS dataset. This dataset includes all prescriptions dispensed under the PBS or the Repatriation Pharmaceutical Benefits Scheme, including prescriptions that do not receive an Australian Government subsidy. Note that some dispensed medicines may not be consumed by the patient.

The dataset does not include prescriptions dispensed for patients during their hospitalisation in public hospitals, discharge prescriptions dispensed from public hospitals in New South Wales and the Australian Capital Territory, direct supply of medicines to remote Aboriginal health services, over-the-counter purchase of medicines, doctor's bag medicines and private prescriptions.

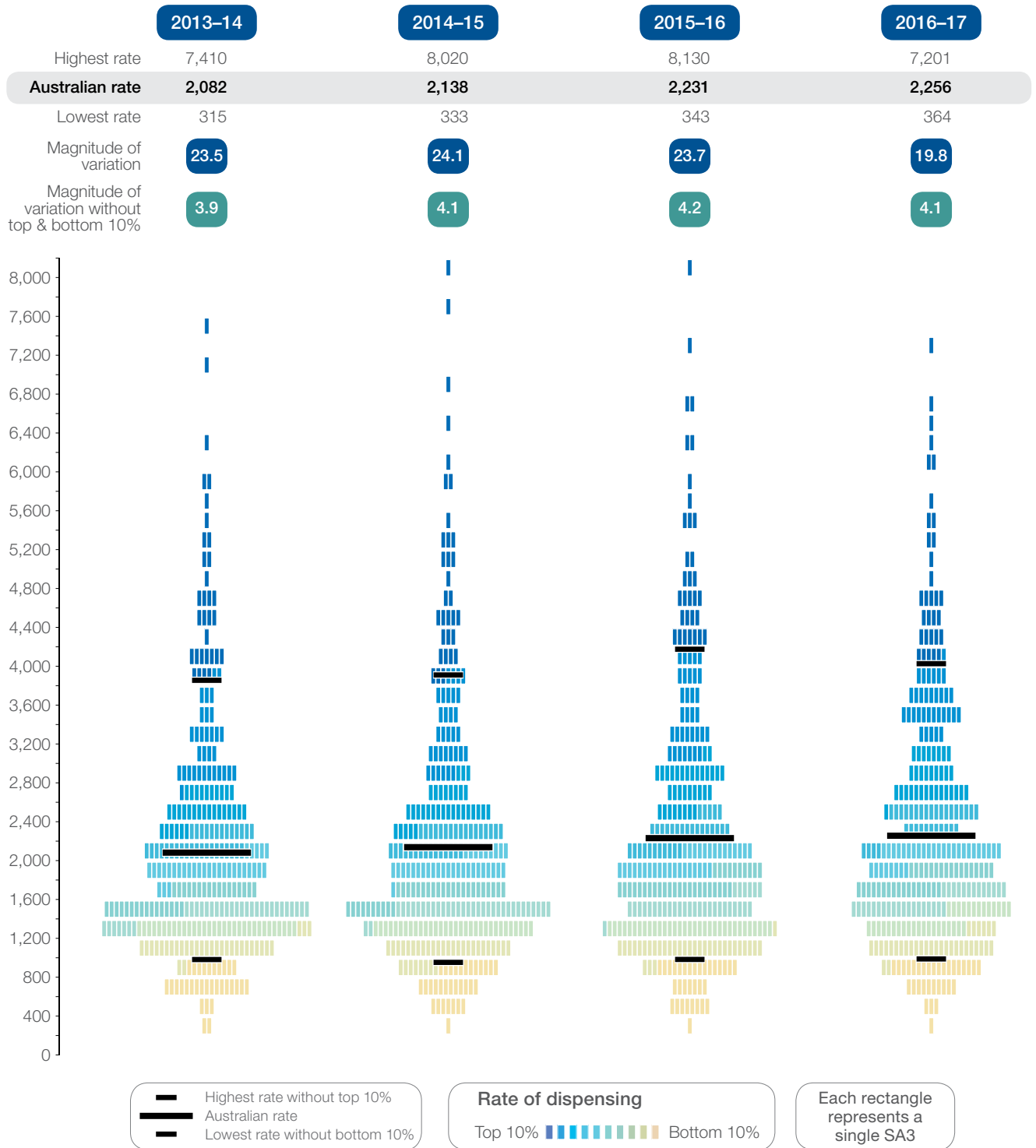
The PBS data do not include prescriptions for clozapine dispensed by public hospitals and claimed through offline arrangements up to 2014–15. The Technical Supplement has further details about clozapine prescriptions.

This analysis was not undertaken by Aboriginal and Torres Strait Islander status because this information was not available for PBS data at the time of publication.

Changes have been made to the data specification used in the first Atlas to improve the robustness of comparing rates over time. The main change is the addition of sex standardisation, as the data specification for the first Atlas standardised for age only. These changes have resulted in small differences in the rates reported for 2013–14 in the first Atlas and this Atlas. The rates reported in this Atlas should be used to monitor changes over time.

# Rates across years

Figure 5.10: Number of PBS prescriptions dispensed for antipsychotic medicines per 100,000 people aged 17 years and under, age and sex standardised, by Statistical Area Level 3 (SA3) of patient residence, 2013–14 to 2016–17



**Notes:**

For further detail about the methods used, please refer to the Technical Supplement.

**Sources:** AIHW analysis of Pharmaceutical Benefits Scheme data and ABS Estimated Resident Population 30 June 2013 to 2016.

# Antipsychotic medicines dispensing, 17 years and under

## What do the data show?

### Magnitude of variation

In 2016–17, the rate of dispensing of antipsychotic medicine prescriptions in people aged 17 years and under was **19.8 times as high** in the area (Statistical Area Level 3 – SA3) with the highest rate as in the SA3 with the lowest rate. The magnitude of variation **decreased** from 2013–14, when there was a 23.5-fold difference between the highest and lowest rates (Figure 5.10).

### Rate of prescriptions dispensed

In 2016–17, there were 117,511 PBS prescriptions dispensed for antipsychotic medicines to people aged 17 years and under, representing an Australian rate of **2,256** prescriptions per 100,000 people aged 17 years and under. The Australian rate **increased** during the four years from 2013–14, when 2,082 prescriptions per 100,000 people aged 17 years and under were dispensed (Figure 5.10).

### People dispensed at least one prescription

In 2016–17, there were **438** people per 100,000 people aged 17 years and under nationally who had at least one prescription dispensed for an antipsychotic medicine. The number of people nationally who had at least one prescription dispensed in a year **increased** during the four years from 2013–14, when 393 people per 100,000 people aged 17 years and under nationally had at least one antipsychotic medicine prescription dispensed (Table 5.11).

Table 5.11: Number of people dispensed at least one prescription for an antipsychotic medicine per 100,000 people aged 17 years and under, age and sex standardised, 2013–14 to 2016–17

	2013–14	2014–15	2015–16	2016–17
Australian rate	393	407	423	438

### Volume of antipsychotic medicines use in people aged 17 years and under

In 2016–17, there were 0.92 defined daily doses\* (DDDs) of antipsychotic medicines per 1,000 people aged 17 years and under dispensed on any given day. The national DDD rate per 1,000 people aged 17 years and under per day **increased** during the four years from 2013–14, when it was 0.83 (Table 5.12).

Table 5.12: Number of defined daily doses of antipsychotic medicines dispensed per 1,000 people aged 17 years and under per day, age and sex standardised, 2013–14 to 2016–17

	2013–14	2014–15	2015–16	2016–17
Australian rate	0.83	0.86	0.90	0.92

\* A defined daily dose (DDD) is a measure of medicines use that allows comparison between different therapeutic groups, and between countries. The DDD is based on the average dose per day of the medicine when used for its main indication by adults. Refer to the Technical Supplement for more information.



## Interpretation

Between 2013–14 and 2016–17, the rate of antipsychotic medicines dispensed per 100,000 people aged 17 years and under increased by 8% in Australia during the four-year period. The magnitude of variation in dispensing rates decreased, but was still high in 2016–17. The rate of people dispensed at least one prescription increased during the four years from 2013–14. The volume of antipsychotic medicines used in the Australian community in this age group, as indicated by the DDD per 1,000 people per day, also increased, indicating that the overall amount of antipsychotic medicines supplied to people in this age group increased during the four-year period.

Potential reasons for this pattern include:

- An increase in the prevalence of mental health conditions in this age group
- An increase in the number of people in this age group seeking care
- Changes to guidelines and prescribing behaviours, affecting the type of antipsychotic medicine chosen and the dose dispensed (as doses for different indications will affect the DDD)
- Changes in access to psychosocial interventions, mental health services, or psychiatric and psychological services.

To explore this, further analysis could potentially focus on:

- Types of antipsychotics, reasons for prescribing and doses being prescribed
- Dispensing rates based on practitioner type, to determine whether there is variation in prescribing between primary care and specialist care providers (currently under analysis by the Australian Commission on Safety and Quality in Health Care – the Commission).

## Is there more to be done?

Dispensing rates and the volume of antipsychotic medicines in the community on any given day in people aged 17 years and under continued to increase during the four years from 2013–14. It is unclear whether this reflects increased incidence of mental health conditions and diagnosis, improved access to medicines, or increased inappropriate use. Although the magnitude of variation in dispensing rates fell from 2013–14, it was still high in 2016–17. Further investigation is required to identify whether these patterns are unwarranted, and what ongoing vigilance is needed to promote safe and appropriate use of these medicines.

The Commission will publish a further analysis of these data in 2019, including analyses by state and territory, and local area; and an analysis by practitioner type. This information will help to identify what further targeted interventions are needed to improve the management of mental illness, and that of behavioural disturbances in autism spectrum disorder.

# Antipsychotic medicines dispensing, 17 years and under

## References

1. Australian Commission on Safety and Quality in Health Care, National Health Performance Authority. Australian Atlas of Healthcare Variation. Sydney: ACSQHC; 2015.
2. Vitiello B, Correll C, van Zwieten-Boot B, Zuddas A, Parellada M, Arango C. Antipsychotics in children and adolescents: increasing use, evidence for efficacy and safety concerns. *Eur Neuropsychopharmacol* 2009;19(9):629–35.
3. Drug Utilisation Sub-committee. Use of antipsychotics in children and adolescents, February 2013 & June 2013. Canberra: Australian Government Department of Health. [www.pbs.gov.au/info/industry/listing/participants/public-release-docs/antipsychotics/antipsychotics-children-adolescents-2013](http://www.pbs.gov.au/info/industry/listing/participants/public-release-docs/antipsychotics/antipsychotics-children-adolescents-2013) (accessed Sep 2018).
4. Australian Government National Mental Health Commission [Internet]. Canberra: Australian Government; 2014 [cited 2018 Oct]. Available from: [www.mentalhealthcommission.gov.au/](http://www.mentalhealthcommission.gov.au/)
5. Australian Bureau of Statistics. Patterns of use of mental health services and prescription medications, 2011. Canberra: Australian Government; 2016. [www.abs.gov.au/ausstats/abs@.nsf/mf/4329.0.00.003](http://www.abs.gov.au/ausstats/abs@.nsf/mf/4329.0.00.003) (accessed Sep 2018).
6. Royal Australian and New Zealand College of Psychiatrists Faculty of Child and Adolescent Psychiatry. Professional practice guideline 7: guidance for psychotropic medication use in children and adolescents. Melbourne: RANZCP; 2015. [www.ranzcp.org/publications/Guidelines-and-resources-for-practice](http://www.ranzcp.org/publications/Guidelines-and-resources-for-practice) (accessed Sep 2018).

## 5.5 Antipsychotic medicines dispensing, 65 years and over

### Context

This section examines antipsychotic medicines dispensing for people aged 65 years and over between 2013–14 and 2016–17.

Antipsychotic medicines are used to manage psychotic disorders such as schizophrenia, and the psychotic symptoms of mood disorders. Antipsychotic medicines are commonly used to reduce or sometimes eliminate the distressing and disabling symptoms of psychosis, such as paranoia, confused thinking, delusions and hallucinations. In older adults, antipsychotic medicines are also used where non-pharmacological approaches have failed to manage behavioural and psychological symptoms of dementia (BPSD).

Effective treatment of psychosis and related disorders includes ongoing clinical support in the community and psychological therapy, including education about symptoms and how to manage them, psychosocial rehabilitation, assistance with accommodation and employment, and educational support. Antipsychotic medicines are considered to be just one component of treating mental health conditions and rarely considered sufficient when used on their own.<sup>1</sup>

Although antipsychotic medicines may be appropriate for adults with severe mental health issues or long-term mental illness, there is concern that these medicines are being prescribed inappropriately in people aged 65 years and over for their sedative effects – that is, as a form of chemical restraint for people with psychological and behavioural symptoms of dementia or delirium.<sup>1,2</sup>

The rate of antipsychotic medicines dispensing per 100,000 people aged 65 years and over was mapped in the first *Australian Atlas of Healthcare Variation*, published in November 2015.<sup>1</sup> The first Atlas reported that, in 2013–14, nearly 1 million Pharmaceutical Benefits Scheme (PBS) prescriptions for antipsychotic medicines were dispensed in Australia to people aged 65 years and over. Dispensing rates were higher than for people aged 18–64 years. Rates were higher in major cities than in regional and remote areas, and there was a weak pattern of higher rates in areas with socioeconomic disadvantage. Lower rates of dispensing of antipsychotic medicines in remote communities were partly attributed to medicines dispensed by remote-area Aboriginal health services not being captured in the PBS database.<sup>1</sup>

# Antipsychotic medicines dispensing, 65 years and over

## Why is it important to monitor antipsychotic medicines use nationally?

Improving use of antipsychotic medicines in this age group is of national importance because of concerns about overuse to manage BPSD, and variation in use of these medicines across Australia. Of particular concern is that these medicines are being prescribed to manage behavioural disturbances related to dementia or delirium before secondary causes have been excluded or non-pharmacological treatment has been tried, which is outside current guideline recommendations.<sup>1-5</sup> People with behavioural disturbances related to dementia or delirium should be treated in the first instance with approaches that do not include antipsychotic medicines. Antipsychotic medicines offer only a modest benefit and are associated with harms such as confusion, falls, pneumonia, hip fracture and stroke.<sup>6-8</sup> For people with severe symptoms – for example, if a person is severely distressed or is a significant risk of harm to themselves or others – antipsychotic medicines may be indicated alongside ongoing non-pharmacological management.<sup>2,5</sup>

## What initiatives have taken place since 2015?

Concerns about the misuse of antipsychotic medicines in people aged 65 years and over have prompted a number of national responses during the past three years. These have included:

- The Caring for Cognitive Impairment campaign by the Australian Commission on Safety and Quality in Health Care (the Commission) – see the infographic at Figure 5.19, page 275. The campaign builds on initiatives to increase awareness of cognitive impairment as a safety and quality issue, including the use of antipsychotic medicines.<sup>9</sup> Actions have included
  - release of the Delirium Clinical Care Standard, which emphasises the importance of minimising use of antipsychotic medicines for behavioural disturbances related to delirium<sup>10</sup>
  - incorporation of actions relating to managing cognitive impairment and minimising use of antipsychotic medicines into the National Safety and Quality Health Service Standards (second edition)<sup>11</sup>
- Two roundtable meetings with key experts convened by the Commission, to specifically discuss ways to reduce inappropriate use of antipsychotic medicines in this age group; the meetings identified the need for a range of multi-component strategies, and system and regulatory levers to address the issue<sup>2</sup>
- Regulatory changes by the Therapeutic Goods Administration, limiting the indication for risperidone use to BPSD of the Alzheimer's type only, and limiting the duration of therapy to a maximum of 12 weeks<sup>2</sup>
- The Veterans' MATES program, funded by the Australian Government Department of Veterans' Affairs, to reduce the use of antipsychotic medicines for treating BPSD<sup>2,12</sup>

- Updated guidelines from the Royal Australian and New Zealand College of Psychiatrists on use of antipsychotic medicines for treatment of BPSD<sup>5,13</sup>
- NPS MedicineWise and Alzheimer’s Australia consumer awareness campaign about medicines and dementia<sup>14</sup>
- Training programs from Dementia Training Australia for staff working in aged care homes about optimising use of antipsychotic medicines in people with dementia<sup>15</sup>
- The Empowered Project, funded by the Australian Government Dementia and Aged Care Services Fund, to empower people living with dementia and their carers to be informed decision-makers about the care and treatment (including any medicines) they receive for their condition<sup>16</sup>
- The RedUSE project (Reducing Use of Sedatives in residential aged care facilities), a prospective, longitudinal program across 150 Australian aged care homes to improve prescribing and use of antipsychotic medicines and benzodiazepines in residents of aged care homes<sup>17,18</sup>
- Inclusion of advice about appropriate use of antipsychotic medicines in Evolve<sup>19</sup> and Choosing Wisely Australia campaigns<sup>20</sup>
- Development of the new Aged Care Quality Standards; assessment and monitoring against these standards will commence from 1 July 2019<sup>21</sup>
- Review of National Aged Care Quality Regulatory Processes and the proposal to establish an Aged Care Quality and Safety Commission.<sup>22</sup>

## About the data

Data are sourced from the PBS dataset. This dataset includes all prescriptions dispensed under the PBS or the Repatriation Pharmaceutical Benefits Scheme, including prescriptions that do not receive an Australian Government subsidy. Note that some dispensed medicines may not be consumed by the patient.

The dataset do not include prescriptions dispensed for patients during their hospitalisation in public hospitals, discharge prescriptions dispensed from public hospitals in New South Wales and the Australian Capital Territory, direct supply of medicines to remote Aboriginal health services, over-the-counter purchase of medicines, doctor’s bag medicines and private prescriptions.

The PBS data do not include prescriptions for clozapine dispensed by public hospitals and claimed through offline arrangements up to 2014–15. The Technical Supplement has further details about clozapine prescriptions.

This analysis was not undertaken by Aboriginal and Torres Strait Islander status because this information was not available for PBS data at the time of publication.

Changes have been made to the data specification used in the first Atlas to improve the robustness of comparing rates over time. The main change is the addition of sex standardisation, as the data specification for the first Atlas standardised for age only. These changes have resulted in small differences in the rates reported for 2013–14 in the first Atlas and this Atlas. The rates reported in this Atlas should be used to monitor changes over time.

# Antipsychotic medicines dispensing, 65 years and over

## What do the data show?

### Magnitude of variation\*

In 2016–17, the rate of dispensing of antipsychotic medicine prescriptions in people aged 65 years and over was **13.2 times as high** in the area (Statistical Area Level 3 – SA3) with the highest rate as in the SA3 with the lowest rate. The magnitude of variation **increased** from 2013–14, when there was a 7.9-fold difference between the highest and lowest rates (Figure 5.18).

### Rate of prescriptions dispensed

In 2016–17, there were 947,941 PBS prescriptions dispensed for antipsychotic medicines to people aged 65 years and over, representing an Australian rate of **25,788** prescriptions dispensed per 100,000 people aged 65 years and over. The Australian rate **decreased** during the four years from 2013–14, when 27,396 prescriptions per 100,000 people were dispensed (Figure 5.18).

### People dispensed at least one prescription

In 2016–17, there were **3,594** people per 100,000 people aged 65 years and over nationally who had at least one prescription dispensed for an antipsychotic medicine. The number of people who had at least one prescription dispensed in a year **decreased** during the four years from 2013–14, when 3,738 people per 100,000 nationally had at least one antipsychotic medicine prescription dispensed (Table 5.16).

**Table 5.16: Number of people dispensed at least one PBS prescription for an antipsychotic medicine per 100,000 people aged 65 years and over, age and sex standardised, 2013–14 to 2016–17**

	2013–14	2014–15	2015–16	2016–17
<b>Australian rate</b>	3,738	3,713	3,652	3,594

### Volume of antipsychotic medicines use in people aged 65 years and over

In 2016–17, there were 11.54 defined daily doses<sup>†</sup> (DDDs) of antipsychotic medicines per 1,000 people aged 65 years and over dispensed on any given day. The national DDD rate per 1,000 people per day was **stable** from 2013–14 to 2016–17 (Table 5.17).

**Table 5.17: Number of defined daily doses of antipsychotic medicines dispensed per 1,000 people aged 65 years and over per day, age and sex standardised, 2013–14 to 2016–17**

	2013–14	2014–15	2015–16	2016–17
<b>Australian rate</b>	11.48	11.55	11.56	11.54

### Interpretation

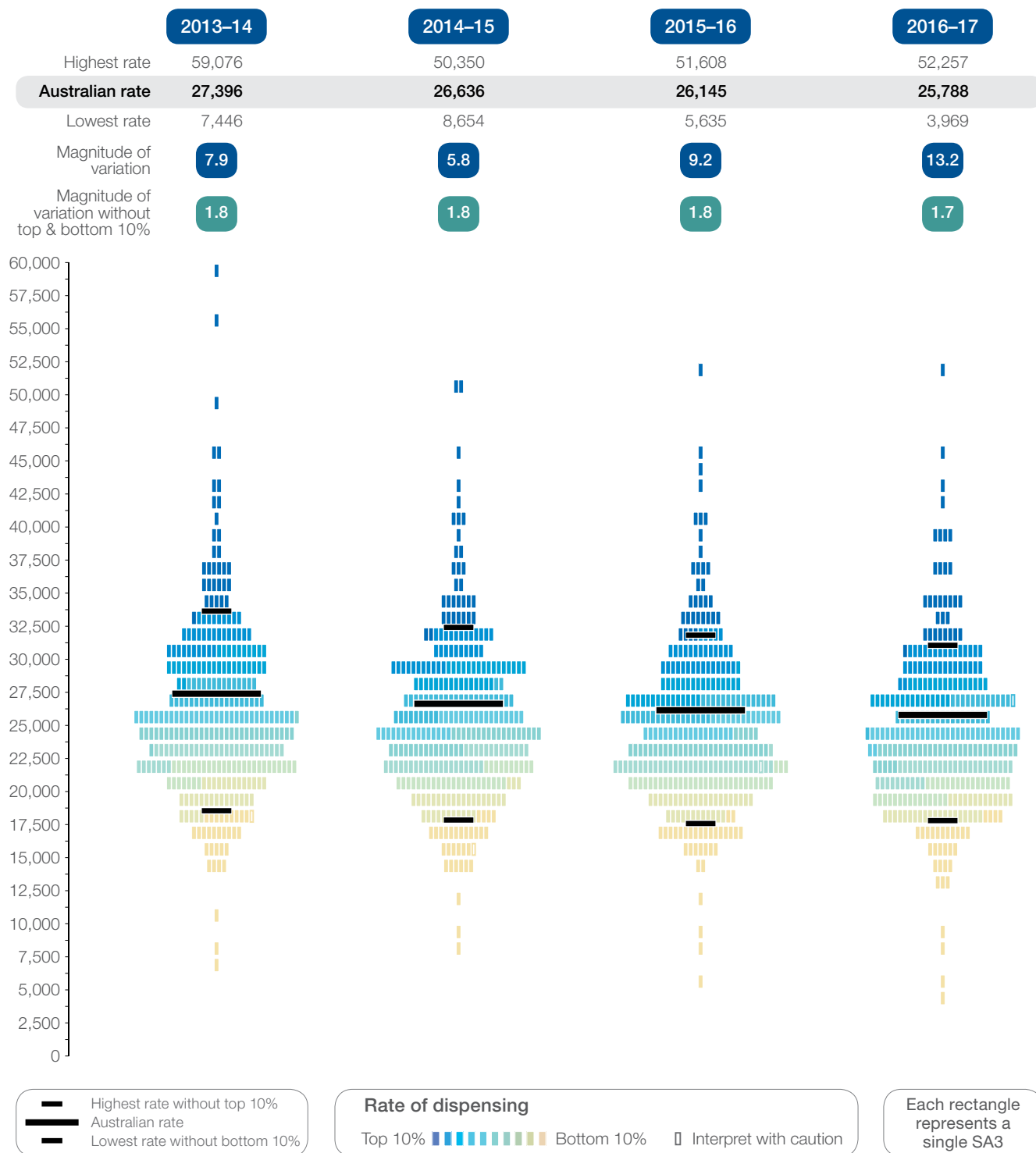
Between 2013–14 and 2016–17, the rate of antipsychotic medicine prescriptions dispensed per 100,000 people aged 65 years and over decreased by 6% in Australia during the four year period, and the rate of people dispensed at least one prescription also decreased. The volume of antipsychotic medicines used in the community in this age group, as indicated by the DDD per 1,000 people per day, remained relatively stable, indicating that there was little change in the overall amount of antipsychotic medicines supplied to people in this age group during the four-year period. The magnitude of variation in dispensing rates also increased from 2013–14, which might indicate changes in medicine use in some areas but not in others.

\* Some of the published SA3 rates were considered more volatile than others. These rates are excluded from the calculation of the difference between the highest and lowest SA3 rates in Australia.

† A defined daily dose (DDD) is a measure of medicines use that allows comparison between different therapeutic groups, and between countries. The DDD is based on the average dose per day of the medicine when used for its main indication by adults. Refer to the Technical Supplement for more information.

# Rates across years

Figure 5.18: Number of PBS prescriptions dispensed for antipsychotic medicines per 100,000 people aged 65 years and over, age and sex standardised, by Statistical Area Level 3 (SA3) of patient residence, 2013–14 to 2016–17



**Notes:**

Hollow rectangles (□) indicate rates that are considered more volatile than other published rates and should be interpreted with caution. These rates are excluded from the calculation of the difference between the highest and lowest SA3 rates in Australia. For further detail about the methods used, please refer to the Technical Supplement.

**Sources:** AIHW analysis of Pharmaceutical Benefits Scheme data and ABS Estimated Resident Population 30 June 2013 to 2016.

# Antipsychotic medicines dispensing, 65 years and over

Potential reasons for this pattern include:

- Changes in guidelines and prescribing behaviours, affecting the type of antipsychotic medicine chosen and the dose dispensed (as different doses for different indications will affect the DDD)
- People in this age group using these treatments for longer durations.

To explore this, further analysis could potentially focus on:

- Types of antipsychotic medicines, reasons for prescribing (for example, behavioural disturbances in older people) and doses being prescribed
- Possible substitution with other sedating medicines
- Quantities of antipsychotic medicines being dispensed on authority prescriptions
- The relationship between dispensing rates and location of aged care facilities.

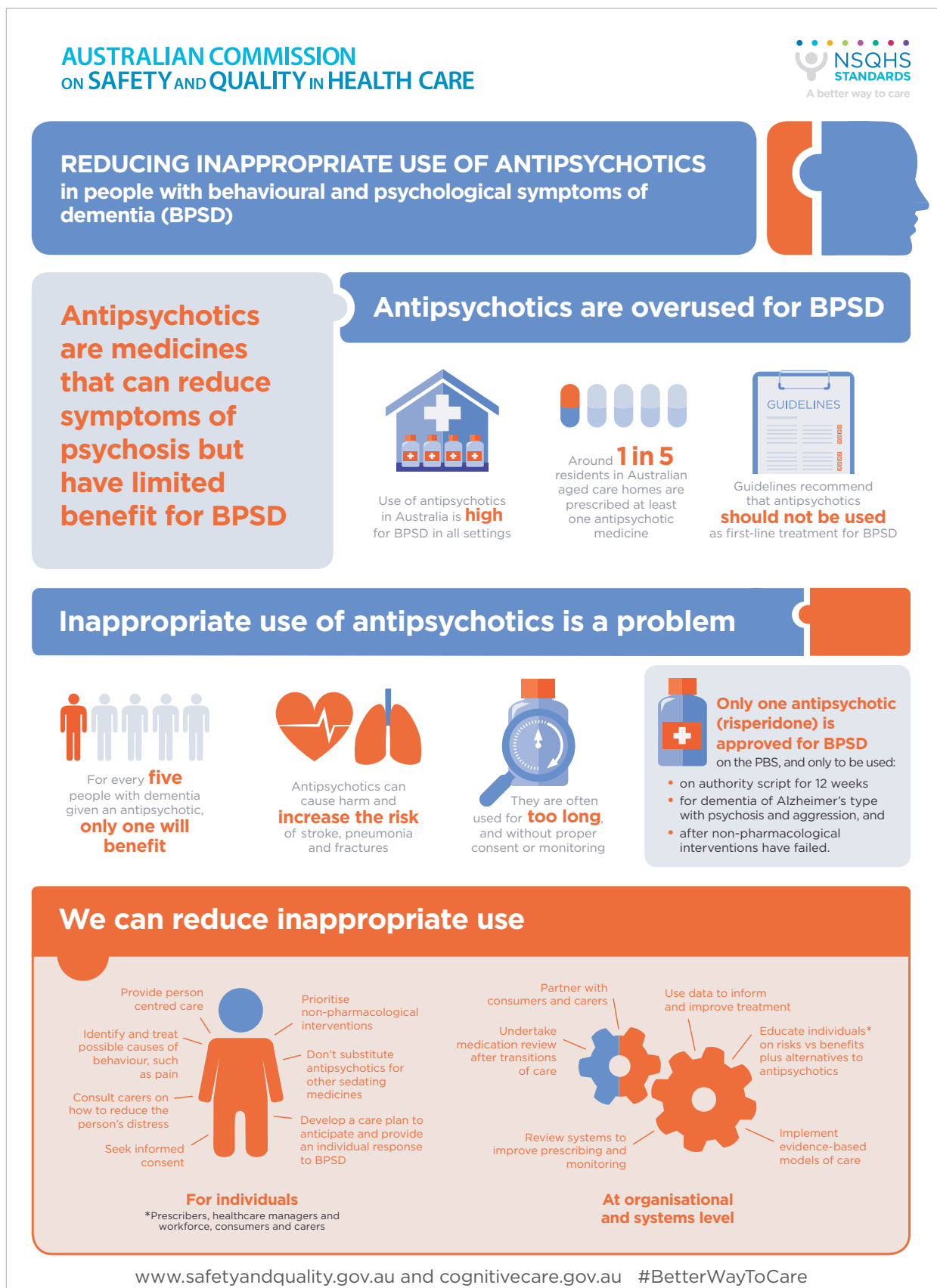
## Is there more to be done?

Although the rate of prescriptions dispensed for antipsychotic medicines for people aged 65 years and over fell in Australia during the four years from 2013–14, the findings suggest that a continued focus on improving use in older people is warranted. The magnitude of variation in dispensing rates of antipsychotic medicines between areas increased from 2013–14, and there was no major change in the overall volume of antipsychotic medicines supplied on any given day in the Australian community to people in this age group. Improved data on the reasons antipsychotic medicines are prescribed are essential for identifying whether prescribing is appropriate. This will help to identify whether further targeted strategies and regulatory changes are needed to discourage the use of antipsychotic medicines as a restrictive practice, and encourage non-pharmacological management of behavioural and psychological symptoms of dementia and delirium.

The Commission will publish a further analysis of these data in 2019, including analyses by state and territory, and local area; and an analysis by practitioner type. This information will help to identify what further targeted interventions are needed to promote the safe and appropriate use of these medicines.



Figure 5.19: Infographic from the Caring for Cognitive Impairment Campaign



# Antipsychotic medicines dispensing, 65 years and over

## References

1. Australian Commission on Safety and Quality in Health Care, National Health Performance Authority. Australian Atlas of Healthcare Variation. Sydney: ACSQHC; 2015.
2. Australian Commission on Safety and Quality in Health Care. Vital signs 2017: the state of safety and quality in Australian health care. Sydney: ACSQHC; 2017.
3. Banerjee S. The use of antipsychotic medication for people with dementia: time for action. London: Department of Health; 2009.
4. Hollingsworth S, Lie D, Siskind D, Byrne G, Hall W, Whiteford H. Psychiatric drug prescribing in elderly Australians: time for action. *Aust NZ J Psychiatry* 2011;45:705–8.
5. Royal Australian and New Zealand College of Psychiatrists. Clinical practice guidelines and principles of care for people with dementia. Melbourne: RANZCP; 2016. [www.ranzcp.org/publications/Guidelines-and-resources-for-practice](http://www.ranzcp.org/publications/Guidelines-and-resources-for-practice) (accessed Sep 2018).
6. Pratt N, Roughead E, Ramsay E, Salter A, Ryan P. Risk of hospitalization for stroke associated with antipsychotic use in the elderly: a self-controlled case series. *Drugs Aging* 2010;27:885–93.
7. Pratt N, Roughead E, Ramsay E, Salter A, Ryan P. Risk of hospitalization for hip fracture and pneumonia associated with antipsychotic prescribing in the elderly: a self-controlled case-series analysis in an Australian health care claims database. *Drug Safety* 2011;34:567–75.
8. Tampi R, Tampi D, Balachandran S, Srinivasan S. Antipsychotic use in dementia: a systematic review of benefits and risks from meta-analyses. *Ther Adv Chronic Dis* 2016;7:229–45.
9. Australian Commission on Safety and Quality in Health Care. Safe and high-quality care for people with cognitive impairment [Internet]. Sydney: ACSQHC; 2018 [cited 2018 Sep]. Available from: <https://www.safetyandquality.gov.au/our-work/cognitive-impairment/>
10. Australian Commission on Safety and Quality in Health Care. Delirium Clinical Care Standard. Sydney: ACSQHC; 2016.
11. Australian Commission on Safety and Quality in Health Care. Assessment to the NSQHS Standards [Internet]. Sydney: ACSQHC; 2018 [cited 2018 Sep]. Available from: [www.safetyandquality.gov.au/our-work/assessment-to-the-nsqhs-standards/](http://www.safetyandquality.gov.au/our-work/assessment-to-the-nsqhs-standards/)
12. Australian Government Department of Veterans' Affairs. Veterans' Mates [Internet]. Adelaide: University of South Australia; [cited 2018 Oct]. Available from: [www.veteransmates.net.au](http://www.veteransmates.net.au)
13. Royal Australian and New Zealand College of Psychiatrists. Antipsychotic medications as a treatment of behavioural and psychological symptoms of dementia. Melbourne: RANZCP; 2016. [www.ranzcp.org/publications/Guidelines-and-resources-for-practice](http://www.ranzcp.org/publications/Guidelines-and-resources-for-practice) (accessed Sep 2018).
14. NPS MedicineWise, Alzheimer's Australia. Medicines and dementia: what you need to know Canberra: NPS MedicineWise; 2016. [www.nps.org.au/news/living-with-dementia-making-treatment-decisions#booklet](http://www.nps.org.au/news/living-with-dementia-making-treatment-decisions#booklet) (accessed Sep 2018).
15. Dementia Training Australia. Dementia Training Australia. Wollongong: Department of Health; 2016. [www.dementiatrainingaustralia.com.au](http://www.dementiatrainingaustralia.com.au) (accessed Sep 2018).
16. Capacity Australia, Dementia Centre for Research Collaboration. The Empowered Project [Internet]. Department of Health; 2017 [cited 2018 Sep]. Available from: [www.empoweredproject.org.au](http://www.empoweredproject.org.au)
17. Westbury J, Gee P, Ling T, Bindoff I, Brown D, Franks K, et al. Reducing the use of sedative medication in aged care facilities: implementation of the 'RedUSE' project into everyday practice. Hobart: Wicking Dementia Research and Education Centre, University of Tasmania; 2016.
18. Westbury JL, Gee P, Ling T, Brown DT, Franks KH, Bindoff I, et al. RedUSE: reducing antipsychotic and benzodiazepine prescribing in residential aged care facilities. *Med J Aust* 2018;208(9):398–403. Epub 2018/05/12.
19. Royal Australasian College of Physicians. Evolve. Better care. Better decision-making. Better use of resources. [Internet]. Sydney: RACP [cited 2018 Sep]. Available from: [www.evolve.edu.au/about](http://www.evolve.edu.au/about)
20. NPS MedicineWise. Choosing Wisely Australia [Internet]. Sydney: NPS MedicineWise; 2016 [cited 2018 Sep]. Available from: [www.choosingwisely.org.au/home](http://www.choosingwisely.org.au/home)
21. Australian Government Department of Health. Single set of quality standards – the Aged Care Quality Standards [Internet]. Canberra: Department of Health; 2018 [cited 2018 Sep]; Available from: [www.agedcare.health.gov.au/quality/single-set-of-aged-care-quality-standards](http://www.agedcare.health.gov.au/quality/single-set-of-aged-care-quality-standards)
22. Australian Government Department of Health. Review of national aged care quality regulatory processes [Internet]. Canberra: Department of Health; 2018 [cited 2018 Sep]. Available from: [www.agedcare.health.gov.au/quality/review-of-national-aged-care-quality-regulatory-processes](http://www.agedcare.health.gov.au/quality/review-of-national-aged-care-quality-regulatory-processes)

## 5.6 ADHD medicines dispensing, 17 years and under

### Context

This section examines dispensing rates of medicines for attention deficit hyperactivity disorder (ADHD) for children and adolescents aged 17 years and under between 2013–14 and 2016–17.

It is estimated that ADHD affects about 7% of Australian children.<sup>1</sup> Children with ADHD often experience changes in behaviour, concentration and attention, and have problems with inattention, impulsivity or overactivity. The condition is also associated with higher rates of accidents and injuries, learning difficulties, drug and alcohol abuse, and family conflict.<sup>2,3</sup>

A comprehensive assessment involving the child or adolescent and their family and teachers is important in developing an individualised management plan that addresses the specific needs of the child or adolescent in managing ADHD.<sup>2,4</sup>

Management of ADHD can include a range of interventions, either alone or in combination. Interventions are commonly psychological, pharmacological or educational in nature. Milder forms of ADHD can be treated with non-pharmacological interventions, and medicines should not be used as first-line treatment in children of preschool age. Medicines should only be used when symptoms significantly impair academic, social or behavioural functions.<sup>2,5</sup>

The rate of ADHD medicines dispensing per 100,000 people aged 17 years and under was mapped in the first *Australian Atlas of Healthcare Variation*, published in November 2015.<sup>2</sup> The first Atlas reported that, in 2013–14, just over 500,000 Pharmaceutical Benefits Scheme (PBS) prescriptions for ADHD medicines were dispensed in Australia to people aged 17 years and under. Variation in use was marked, with a 75-fold difference in rates of dispensing between local areas. Rates were higher in inner and outer regional areas than in major cities, and lower again in remote communities. Dispensing rates were also higher in areas with socioeconomic disadvantage. Lower dispensing rates of ADHD medicines in remote communities were attributed to medicines dispensed by remote-area Aboriginal health services not being captured in the PBS database.<sup>2</sup>

# ADHD medicines dispensing, 17 years and under

## Why is it important to monitor ADHD medicines use nationally?

Improving the use of ADHD medicines is of national importance because of the wide variation in use, and uncertainties about appropriate use.<sup>2</sup> Although ADHD medicines can be very effective in reducing symptoms of ADHD, not all children experience benefit.

Some children may experience uncomfortable or harmful side effects. It is therefore essential that these medicines are prescribed appropriately to ensure that the benefits outweigh the risks.

## What initiatives have taken place since 2015?

Since 2015, initiatives to improve use of ADHD medicines in this age group have been undertaken as part of a wider strategy to improve the management of mental health conditions in Australia. The National Mental Health Commission, which was established in 2012, continues to provide advice on ways to improve Australia's mental health and acts as a catalyst for change.<sup>6</sup> In 2016, the Australian Bureau of Statistics published *Patterns of Use of Mental Health Services and Prescription Medications, 2011*.<sup>7</sup> In 2016, the Australian ADHD Professionals Association was formed to specifically promote evidence-based research, diagnosis and management of ADHD across Australia.<sup>8</sup>

## About the data

Data are sourced from the PBS dataset. This dataset includes all prescriptions dispensed under the PBS or Repatriation Pharmaceutical Benefits Scheme, including prescriptions that do not receive an Australian Government subsidy. Note that some dispensed medicines may not be consumed by the patient.

The dataset does not include prescriptions dispensed for patients during their hospitalisation in public hospitals, discharge prescriptions dispensed from public hospitals in New South Wales and the Australian Capital Territory, direct supply of medicines to remote Aboriginal health services, over-the-counter purchase of medicines, doctor's bag medicines and private prescriptions.

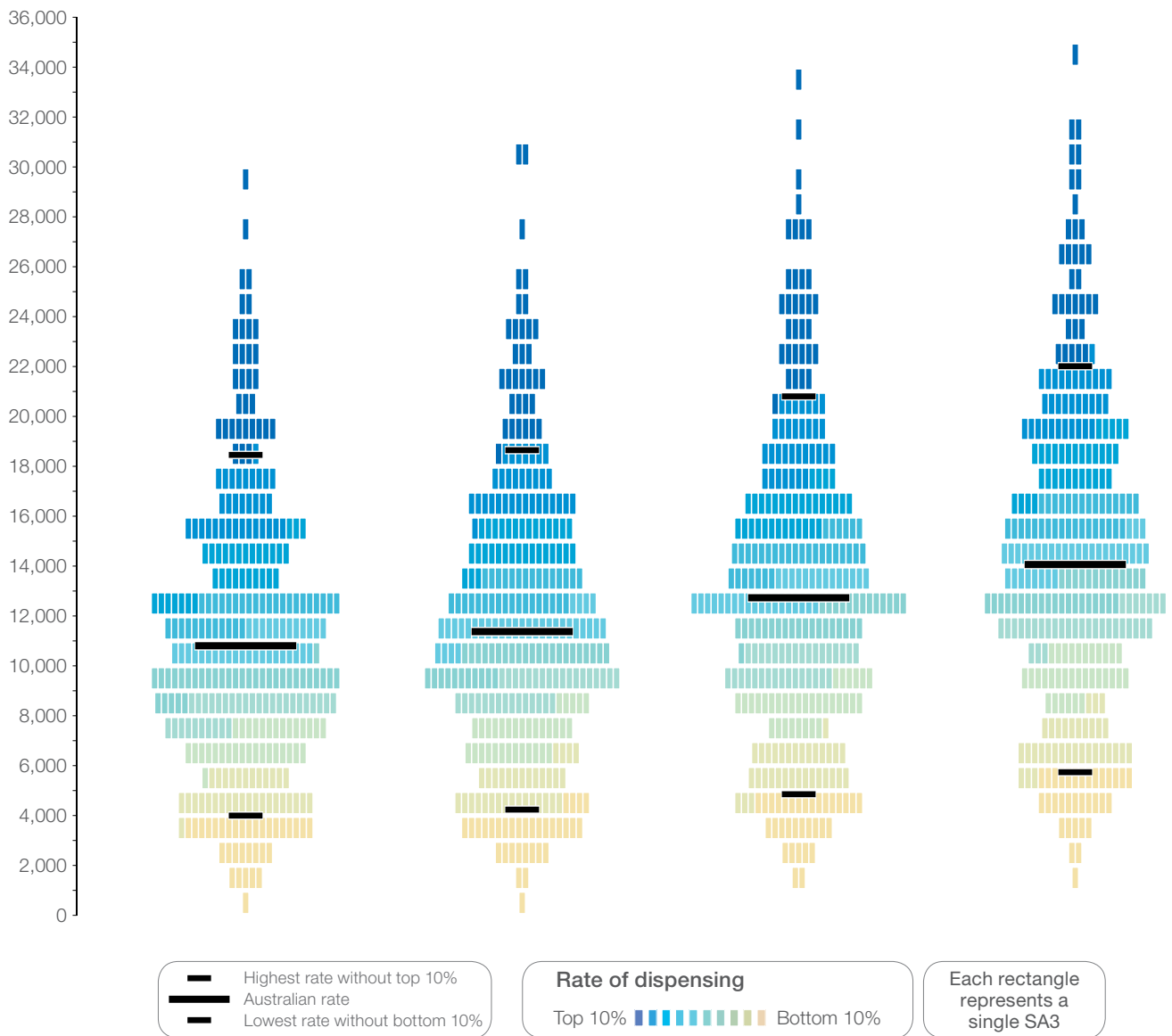
This analysis was not undertaken by Aboriginal and Torres Strait Islander status because this information was not available for PBS data at the time of publication.

Changes have been made to the data specification used in the first Atlas to improve the robustness of comparing rates over time. The main change is the addition of sex standardisation, as the data specification for the first Atlas standardised for age only. These changes have resulted in small differences in the rates reported for 2013–14 in the first Atlas and this Atlas. The rates reported in this Atlas should be used to monitor changes over time.

# Rates across years

Figure 5.20: Number of PBS prescriptions dispensed for ADHD medicines per 100,000 people aged 17 years and under, age and sex standardised, by Statistical Area Level 3 (SA3) of patient residence, 2013–14 to 2016–17

	2013–14	2014–15	2015–16	2016–17
Highest rate	29,817	30,839	33,712	34,465
<b>Australian rate</b>	<b>10,805</b>	<b>11,373</b>	<b>12,730</b>	<b>14,061</b>
Lowest rate	401	768	1,226	1,981
Magnitude of variation	74.4	40.2	27.5	17.4
Magnitude of variation without top & bottom 10%	4.6	4.4	4.3	3.8



**Notes:**

For further detail about the methods used, please refer to the Technical Supplement.

**Sources:** AIHW analysis of Pharmaceutical Benefits Scheme data and ABS Estimated Resident Population 30 June 2013 to 2016.

# ADHD medicines dispensing, 17 years and under

## What do the data show?

### Magnitude of variation

In 2016–17, the rate of dispensing of ADHD medicine prescriptions in people aged 17 years and under was **17.4 times as high** in the area (Statistical Area Level 3 – SA3) with the highest rate as in the SA3 with the lowest rate. The magnitude of variation **decreased** from 2013–14, when there was a 74.4-fold difference between the highest and lowest rates (Figure 5.20).

### Rate of prescriptions dispensed

In 2016–17, there were 737,037 PBS prescriptions dispensed for ADHD medicines to people aged 17 years and under, representing an Australian rate of **14,061** prescriptions dispensed per 100,000 people aged 17 years and under. The Australian rate **increased** during the four years from 2013–14, when 10,805 prescriptions per 100,000 people aged 17 years and under were dispensed (Figure 5.20).

### People dispensed at least one prescription

In 2016–17, there were **1,940** people per 100,000 people aged 17 years and under nationally who had at least one ADHD medicine prescription dispensed. The number of people who had at least one prescription dispensed in a year **increased** during the four years from 2013–14, when 1,540 people aged 17 years and under nationally had at least one ADHD medicine prescription dispensed (Table 5.21).

**Table 5.21: Number of people dispensed at least one prescription for an ADHD medicine per 100,000 people aged 17 years and under, age and sex standardised, 2013–14 to 2016–17**

	2013–14	2014–15	2015–16	2016–17
Australian rate	1,540	1,620	1,784	1,940

### Volume of ADHD medicines used in people aged 17 years and under

In 2016–17, there were 13.75 defined daily doses\* (DDDs) of ADHD medicines per 1,000 people aged 17 years and under dispensed on any given day. The national DDD rate per 1,000 people per day **increased** during the four years from 2013–14, when it was 10.52 (Table 5.22).

**Table 5.22: Number of defined daily doses of ADHD medicines dispensed per 1,000 people aged 17 years and under per day, age and sex standardised, 2013–14 to 2016–17**

	2013–14	2014–15	2015–16	2016–17
Australian rate	10.52	11.03	12.35	13.75

### Interpretation

Between 2013–14 and 2016–17, the rate of ADHD medicines dispensed per 100,000 people aged 17 years and under increased by 30% in Australia during the four-year period. The rate of people dispensed at least one prescription also increased during the four years from 2013–14. The volume of ADHD medicines used in the Australian community in this age group, as indicated by the rate of DDD per 1,000 people per day, increased, indicating that the overall amount of ADHD medicines supplied increased during the four-year period. Although the magnitude of variation in dispensing rates fell substantially, this might indicate changes in medicine use in some areas but not others.

\* A defined daily dose (DDD) is a measure of medicines use that allows comparison between different therapeutic groups, and between countries. The DDD is based on the average dose per day of the medicine when used for its main indication by adults. Refer to the Technical Supplement for more information.

Potential reasons for this pattern include:

- Changes in prevalence of mental health conditions in this age group
- Changes in the number of people seeking care in this age group
- Changes in access to psychosocial services, mental health services, or psychiatric and psychological services
- People in this age group using these treatments for longer durations.

To explore this, further analysis could potentially focus on:

- Dispensing rates based on practitioner type, to determine whether there is variation in prescribing between primary care and specialist care providers (currently under analysis by the Australian Commission on Safety and Quality in Health Care – the Commission)
- Dispensing rates by state and territory, and local area, to determine whether there has been a change in prescribing in some areas and not others
- Whether dispensing rates differ between age groups – for example, pre- and post-puberty
- The relationship between dispensing rates and the location of youth correction centres.

## Is there more to be done?

Dispensing rates and the volume of ADHD medicines in the community continued to increase during the four years from 2013–14. It is unclear whether this reflects increased incidence of ADHD and diagnosis, improved access to medicines and specialised services, differences in models of care, or increased inappropriate use. Although the magnitude of variation in dispensing rates fell substantially over the four-year period, it is still high. Further investigation is required to identify whether these patterns are unwarranted, and what ongoing vigilance is needed to promote safe and appropriate use of these medicines.

The Commission will publish a further analysis of these data in 2019, including analyses by state and territory, and local area; and an analysis by practitioner type. This information will help better understand whether targeted interventions are needed to promote the safe and appropriate use of these medicines.

# ADHD medicines dispensing, 17 years and under

## References

1. Lawrence D, Johnson S, Hafekost J, Boterhoven de Haan K, Sawyer M, Ainley J, et al. The mental health of children and adolescents: report on the second Australian child and adolescent survey of mental health and wellbeing. Canberra: Australian Government Department of Health; 2015. [www.health.gov.au/internet/main/publishing.nsf/Content/9DA8CA21306FE6EDCA257E2700016945/\\$File/child2.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/9DA8CA21306FE6EDCA257E2700016945/$File/child2.pdf) (accessed Sep 2018).
2. Australian Commission on Safety and Quality in Health Care, National Health Performance Authority. Australian Atlas of Healthcare Variation. Sydney: ACSQHC; 2015.
3. Royal Australian and New Zealand College of Psychiatrists Faculty of Child and Adolescent Psychiatry. Position statement 55: Attention deficit hyperactivity disorder in childhood and adolescence. Melbourne: RANZCP; 2014. [www.ranzcp.org/Files/Resources/College\\_Statements/Position\\_Statements/PS-55-ADHD-in-Childhood-Adolescent-\(October-2014\).aspx](http://www.ranzcp.org/Files/Resources/College_Statements/Position_Statements/PS-55-ADHD-in-Childhood-Adolescent-(October-2014).aspx) (accessed Sep 2018).
4. National Health and Medical Research Council. Clinical practice points on the diagnosis, assessment and management of attention deficit hyperactivity disorder in children and adolescents. Canberra: NHMRC; 2012. [www.nhmrc.gov.au/guidelines-publications/mh26](http://www.nhmrc.gov.au/guidelines-publications/mh26) (accessed Sep 2018).
5. Royal Australasian College of Physicians. Australian guidelines on attention deficit hyperactivity disorder (ADHD). Sydney: RACP; 2009. [www.racp.edu.au/advocacy/division-faculty-and-chapter-priorities/paediatrics-and-child-health-division/australian-guidelines-on-adhd](http://www.racp.edu.au/advocacy/division-faculty-and-chapter-priorities/paediatrics-and-child-health-division/australian-guidelines-on-adhd) (accessed Sep 2018).
6. Australian Government National Mental Health Commission [Internet]. Canberra: Australian Government; 2014 [cited 2018 Oct]. Available from: [www.mentalhealthcommission.gov.au/](http://www.mentalhealthcommission.gov.au/)
7. Australian Bureau of Statistics. Patterns of use of mental health services and prescription medications, 2011. Canberra: ABS; 2016. [www.abs.gov.au/ausstats/abs@.nsf/mf/4329.0.00.003](http://www.abs.gov.au/ausstats/abs@.nsf/mf/4329.0.00.003) (accessed Sep 2018).
8. Australian ADHD Professionals Association [Internet]. AADPA; 2017 [cited 2018 Oct]. Available from: [www.aadpa.com.au](http://www.aadpa.com.au)



## 5.7 Opioid medicines dispensing, all ages

### Context

This section examines opioid medicines dispensing in Australia between 2013–14 and 2016–17.

Opioid medicines are effective for managing acute pain, cancer pain, pain in a palliative care setting and opioid dependency. Growing evidence indicates that opioids are being used outside these indications, leading to potentially avoidable adverse events and harm. Of concern, opioids are being used beyond the acute pain period for chronic non-cancer pain, despite a lack of evidence of benefits, with increased risk of harm.<sup>1</sup>

The transition from acute pain to chronic non-cancer pain includes a change in management strategies away from opioids and towards a multimodal approach of non-pharmacological and pharmacological therapy, supported by a general practitioner (GP) and multidisciplinary allied health teams. In most cases, discontinuing opioids beyond the acute pain period is not associated with an increase in pain intensity and therefore should not be viewed as withholding effective treatment.<sup>2</sup>

Assessment and management of chronic non-cancer pain require a cautious and comprehensive multidimensional approach, combining strategies to reduce pain and its impact, specifically addressing psychosocial factors that often contribute to the patient's pain.<sup>3,4</sup> Currently, opioids have a limited role in the evidence-based management of chronic non-cancer pain other than as part of a multimodal approach. Evidence suggests that modest clinical benefit from opioid use declines over time and can be outweighed by harms. Pharmacological therapy should be considered for patients not responding to non-pharmacological therapy. If opioid therapy is to be considered despite a lack of evidence in a chronic non-cancer pain setting, a trial-based approach of short duration is recommended, with clearly defined management goals and frequent monitoring of patients to determine benefit.<sup>3,4</sup>

# Opioid medicines dispensing, all ages

The rate of opioid medicines dispensing per 100,000 people in all age groups was mapped in the first *Australian Atlas of Healthcare Variation*, published in November 2015.<sup>4</sup> The first Atlas reported that, in 2013–14, almost 14 million Pharmaceutical Benefits Scheme (PBS) prescriptions for opioid medicines were dispensed in Australia. Dispensing rates tended to be higher in inner and outer regional areas than in major cities, and tended to be higher in areas with socioeconomic disadvantage.<sup>4</sup>

It is important to note that data captured in the PBS and reported in the first *Australian Atlas of Healthcare Variation* underestimate total opioid dispensing. This is because the data do not capture sales of over-the-counter medicines (from pharmacies) containing low-dose codeine in combination with simple analgesics, nor opioids dispensed on private prescriptions. Since 1 February 2018, medicines in Australia that contain low-dose codeine can only be obtained on a prescription, but are not captured in PBS data because they are private prescriptions (not included on the PBS).

## Why is it important to monitor opioid use nationally?

Improving opioid medicines use is of national importance because of concerns about increases in inappropriate prescribing and misuse, overdose and opioid dependence.<sup>5,6</sup> High doses of opioids (more than 100 mg of oral morphine or equivalent per day) are associated with an increased risk of harm.<sup>1,4</sup> Between 2001 and 2014, opioids were the second most common medicine contributing to all adverse drug reaction–related hospital admissions in New South Wales.<sup>7</sup> In addition, there is a lack of quality evidence for the effectiveness of chronic dosing of opioid medicines to improve chronic non-cancer pain.<sup>3,8</sup> Guidelines used in primary care settings recommend variable daily dose limits in oral morphine milligram equivalents.<sup>9</sup>

Opioid medicine deaths in Australia exceed heroin deaths by a significant margin. Between 2011 and 2015, twice as many people died from overdose associated with an opioid medicine as from an overdose of heroin (2,145 compared with 985).<sup>6,10</sup> Over the same period, deaths due to opioid overdose (including pharmaceutical opioids and heroin) increased by 1.6-fold compared with 2001–2005.<sup>10</sup>

## What initiatives have taken place since 2015?

Concerns about inappropriate prescribing and misuse of opioids have prompted a number of national responses in Australia during the past three years to support harm minimisation. The first *Australian Atlas of Healthcare Variation*, published in November 2015, made five recommendations to support improved prescribing and use of opioid medicines. In response, state and territory departments of health and Primary Health Networks have collaborated to provide access to pain and addiction medicine referral pathways for GPs managing patients with chronic non-cancer pain and/or substance abuse disorder. Implementation of real-time prescription monitoring is also under way in various states and territories. Other national responses that have been implemented or proposed include:

- Updated recommendations from the Faculty of Pain Medicine, Australian and New Zealand College of Anaesthetists, on the use of opioid medicines in chronic non-cancer pain<sup>11</sup>
- Guidelines published by the Royal Australian College of General Practitioners to improve the prescribing of opioid medicines for acute and chronic non-cancer pain<sup>9</sup>
- The Faculty of Pain Medicine position statement on the use of slow-release opioids<sup>12</sup>
- The NPS MedicineWise Chronic Pain educational visiting program<sup>13</sup>, and the Faculty of Pain Medicine Better Pain Management program<sup>14</sup>
- The Therapeutic Goods Administration public consultation on a regulatory response to the use of strong opioids<sup>6</sup>

- Restrictions to the availability of low-dose codeine products in combination with simple analgesics, so that these products are no longer available to patients over the counter at pharmacies<sup>15</sup>
- The Chronic Pain MedsCheck Trial, as part of the 6th Community Pharmacy Agreement<sup>16</sup>
- Letters from the Australian Government Department of Health to selected GPs prompting audit of their opioid prescribing practice to identify areas for quality improvement<sup>17</sup>
- Updated guidance from the Australian Pain Society regarding the management of pain in aged care homes.<sup>18</sup>

## About the data

Data are sourced from the PBS dataset. This dataset includes all prescriptions dispensed under the PBS or the Repatriation Pharmaceutical Benefits Scheme, including prescriptions that do not receive an Australian Government subsidy. Note that some dispensed medicines may not be consumed by the patient.

The dataset does not include prescriptions dispensed for patients during their hospitalisation in public hospitals, discharge prescriptions dispensed from public hospitals in New South Wales and the Australian Capital Territory, direct supply of medicines to remote Aboriginal health services, over-the-counter purchase of medicines, doctor's bag medicines and private prescriptions.

The data do not include codeine-based pain medicines that were available over the counter and became Schedule 4 prescription medicines in February 2018.

This analysis was not undertaken by Aboriginal and Torres Strait Islander status because this information was not available for PBS data at the time of publication.

Changes have been made to the data specification used in the first Atlas to improve the robustness of comparing rates over time. The main change is the addition of sex standardisation, as the data specification for the first Atlas standardised for age only. These changes have resulted in small differences in the rates reported for 2013-14 in the first Atlas and in this Atlas. The rates reported in this Atlas should be used to monitor changes over time.

## What do the data show?

### Magnitude of variation\*

In 2016–17, the rate of dispensing of opioid medicine prescriptions in people of all ages was **5.1 times as high** in the area (Statistical Area Level 3 – SA3) with the highest rate as in the SA3 with the lowest rate. The magnitude of variation **increased** from 2013–14, when there was a 4.8-fold difference between the highest and lowest rates (Figure 5.25).

### Rate of prescriptions dispensed

In 2016–17, there were 15,419,793 PBS prescriptions dispensed for opioid medicines, representing an Australian rate of **58,595** prescriptions dispensed per 100,000 people of all ages. The Australian rate **increased** from 2013–14, when 55,900 prescriptions per 100,000 people were dispensed (Figure 5.25).

\* Some of the published SA3 rates were considered more volatile than others. These rates are excluded from the calculation of the difference between the highest and lowest SA3 rates in Australia.

# Opioid medicines dispensing, all ages

## People dispensed at least one prescription

In 2016–17, there were 12,345 people per 100,000 people nationally who had at least one prescription dispensed for an opioid medicine. The number of people nationally who had at least one prescription dispensed in a year **increased** from 2013–14, when 12,102 people per 100,000 people nationally had at least one opioid medicine prescription dispensed (Table 5.23).

**Table 5.23: Number of people dispensed at least one PBS prescription for an opioid medicine per 100,000 people of all ages, age and sex standardised, 2013–14 to 2016–17**

	2013–14	2014–15	2015–16	2016–17
<b>Australian rate</b>	12,102	12,406	12,418	12,345

## Estimated proportion of population treated daily with opioid medicines

In 2016–17, there were 15.39 defined daily doses<sup>†</sup> (DDDs) of opioid medicines per 1,000 people dispensed on any given day – this is equivalent to 1.5% of the population receiving an opioid medicine each day in that year. The national DDD rate per 1,000 people per day **fell** during the four years from 2013–14, when it was 16.39 (Table 5.24).

**Table 5.24: Number of defined daily doses of opioid medicines dispensed per 1,000 people of all ages per day, age and sex standardised, 2013–14 to 2016–17**

	2013–14	2014–15	2015–16	2016–17
<b>Australian rate</b>	16.39	16.32	15.81	15.39

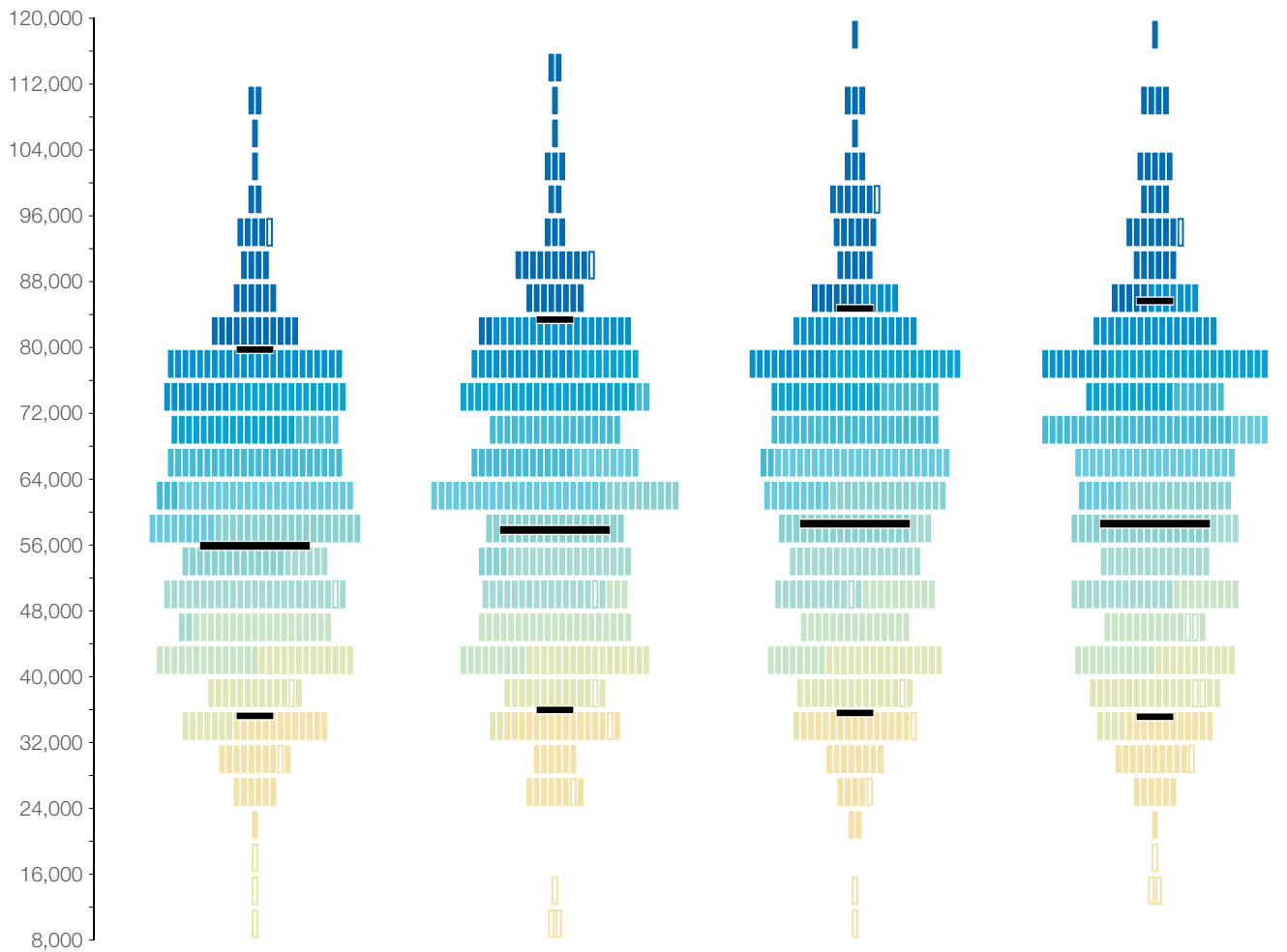
\* Some of the published SA3 rates were considered more volatile than others. These rates are excluded from the calculation of the difference between the highest and lowest SA3 rates in Australia.

† A defined daily dose (DDD) is a measure of medicines use that allows comparison between different therapeutic groups, and between countries. The DDD is based on the average dose per day of the medicine when used for its main indication by adults. Refer to the Technical Supplement for more information.

# Rates across years

Figure 5.25: Number of PBS prescriptions dispensed for opioid medicines per 100,000 people of all ages, age and sex standardised, by Statistical Area Level 3 (SA3) of patient residence, 2013–14 to 2016–17

	2013–14	2014–15	2015–16	2016–17
Highest rate	110,415	113,682	117,780	116,303
<b>Australian rate</b>	<b>55,900</b>	<b>57,833</b>	<b>58,600</b>	<b>58,595</b>
Lowest rate	11,002*	11,296*	10,644*	13,172*
Magnitude of variation	4.8	4.7	5.0	5.1
Magnitude of variation without top & bottom 10%	2.3	2.3	2.4	2.4



Highest rate without top 10%  
 Australian rate  
 Lowest rate without bottom 10%

**Rate of dispensing**

Top 10%                      Bottom 10%

Interpret with caution

Each rectangle represents a single SA3

**Notes:** Hollow rectangles (□) and asterisks (\*) indicate rates that are considered more volatile than other published rates and should be interpreted with caution. These rates are excluded from the calculation of the difference between the highest and lowest SA3 rates in Australia. For further detail about the methods used, please refer to the Technical Supplement.

**Sources:** AIHW analysis of Pharmaceutical Benefits Scheme data and ABS Estimated Resident Population 30 June 2013 to 2016.

# Opioid medicines dispensing, all ages

## Interpretation

Between 2013–14 and 2016–17, the rate of opioid medicines dispensed per 100,000 people nationally increased by 5%, during the four-year period, and the rate of people dispensed at least one prescription also increased. An increase in the magnitude of variation in dispensing rates also occurred. It is unclear whether this pattern indicates changes in medicines use in some states and territories or local areas and not others. However, the volume of opioids used in the Australian community, as indicated by the DDD per 1,000 people per day, declined slightly, indicating that the overall amount of opioid medicines supplied decreased slightly during the four-year period.

Potential reasons for this pattern include, but are not limited to changes in:

- The amount or type of surgery being performed, with associated opioid dispensing in a greater number of patients postoperatively
- The availability and accessibility of non-pharmacological treatment options
- Prescribing indications and behaviours affecting the reason for choosing an opioid, the type of opioid chosen and the dose dispensed.

To explore this, further analysis could potentially focus on:

- The amount or types of surgery being performed, and whether any increase coincides with the number of patients prescribed opioids postoperatively to manage their pain
- The use of multidisciplinary pain referral pathways or addiction medicine pathways for GPs managing patients with chronic non-cancer pain and/or substance abuse disorder
- Types of opioids, reasons for prescribing and doses being dispensed
- Quantities of opioid medicines being dispensed on authority prescriptions
- Dispensing rates based on practitioner type, to determine whether there is variation in prescribing between primary care and specialist care providers

- Weak and strong opioid use
- Use of services and other strategies to help patients self-manage their pain
- Use of other agents for chronic non-cancer pain, such as non-steroidal anti-inflammatory drugs (NSAIDs), gabapentinoids, clonidine and possibly medicinal cannabis.

## Is there more to be done?

Although it is encouraging to see that the overall amount of opioid medicines supplied decreased slightly during the four years from 2013–14, dispensing rates continued to increase. It is unclear if these changes are due to changes in the number of people requiring opioids for appropriate uses, changes in doses used, or an increase in inappropriate prescribing. The magnitude of variation in dispensing rates between local areas has also increased. This is despite the number of regulatory efforts already in place to minimise harm from opioid medicines, and strategies to optimise the management of chronic non-cancer pain. It suggests that a continued focus on improving medicine use in this area is needed. Improved understanding of reasons for prescribing opioid medicines will help to identify whether these patterns are unwarranted and whether further targeted strategies are needed.

The Commission will publish a further analysis of these data in 2019, including analyses by state and territory, and local areas. This information will help identify the regional areas where dispensing of opioid medicines continues to rise.

## References

1. Chou R, Turner JA, Devine EB, Hansen RN, Sullivan SD, Blazina I, et al. The effectiveness and risks of long-term opioid therapy for chronic pain: a systematic review for a National Institutes of Health Pathways to Prevention Workshop. *Ann Int Med* 2015;162(4):276–86. Epub 2015/01/13.
2. McPherson S, Lederhos Smith C, Dobscha SK, Morasco BJ, Demidenko MI, Meath THA, et al. Changes in pain intensity after discontinuation of long-term opioid therapy for chronic noncancer pain. *Pain* 2018;159(10):2097–104. Epub 2018/06/16.
3. Therapeutic guidelines: analgesic. Version 6. Melbourne: Therapeutic Guidelines Limited; 2012.
4. Australian Commission on Safety and Quality in Health Care, National Health Performance Authority. Australian Atlas of Healthcare Variation. Sydney: ACSQHC; 2015.
5. Dobbin M. Pharmaceutical drug misuse in Australia. *Aust Prescr* 2014;37:79–81.
6. Therapeutic Goods Administration. Prescription strong (Schedule 8) opioid use and misuse in Australia: options for a regulatory response. Consultation paper. Version 1.0. Canberra: TGA; 2018. [www.tga.gov.au/sites/default/files/consultation-prescription-strong-schedule-8-opioid-use-misuse-in-australia-options-for-regulatory-response.pdf](http://www.tga.gov.au/sites/default/files/consultation-prescription-strong-schedule-8-opioid-use-misuse-in-australia-options-for-regulatory-response.pdf) (accessed Aug 2018).
7. Zhang H, Du W, Gnjidic D, Chong S, Lancsar E, Glasgow N. Trends in adverse drug reactions related hospitalisations over 13 years in New South Wales, Australia. *Int Med J* 2018. Epub 2018/10/04.
8. Krebs EE, Gravelly A, Nugent S, Jensen AC, DeRonne B, Goldsmith ES, et al. Effect of opioid vs nonopioid medications on pain-related function in patients with chronic back pain or hip or knee osteoarthritis pain: the space randomized clinical trial. *JAMA* 2018;319(9):872–82.
9. Royal Australian College of General Practitioners. Prescribing drugs of dependence in general practice. East Melbourne: RACGP; 2015.
10. Penington Institute. Australia's annual overdose report 2017. Melbourne: Penington Institute; 2017. [www.penington.org.au/australias-annual-overdose-report-2017/](http://www.penington.org.au/australias-annual-overdose-report-2017/) (accessed Aug 2018).
11. Faculty of Pain Medicine, Australian and New Zealand College of Anaesthetists. Recommendations regarding the use of opioid analgesics in patients with chronic non-cancer pain. Melbourne: ANZCA; 2015. [www.fpm.anzca.edu.au/documents/pm1-2010.pdf](http://www.fpm.anzca.edu.au/documents/pm1-2010.pdf) (accessed Aug 2018).
12. Faculty of Pain Medicine, Australian and New Zealand College of Anaesthetists. Position statement on the use of slow-release opioid preparations in the treatment of acute pain. Melbourne: ANZCA; 2018. [www.fpm.anzca.edu.au/front-page-news/%E2%80%8Bposition-statement-on-slow-release-opioids](http://www.fpm.anzca.edu.au/front-page-news/%E2%80%8Bposition-statement-on-slow-release-opioids) (accessed Oct 2018).
13. NPS MedicineWise. Chronic pain [Internet]. Sydney: NPS MedicineWise; 2017 [cited 2018 Sep]. Available from: [www.nps.org.au/medical-info/clinical-topics/chronic-pain](http://www.nps.org.au/medical-info/clinical-topics/chronic-pain)
14. Faculty of Pain Medicine. Better pain management [Internet]. Melbourne: ANZCA; 2017 [cited 2018 Sep]. Available from: [www.fpm.anzca.edu.au/resources/better-pain-management](http://www.fpm.anzca.edu.au/resources/better-pain-management)
15. Therapeutic Goods Administration. Codeine information hub [Internet]. Canberra: TGA; 2018 [cited 2018 Aug]. Available from: [www.tga.gov.au/codeine-info-hub](http://www.tga.gov.au/codeine-info-hub)
16. Australian Government Department of Health. Pharmacy trial to support patients with chronic pain [Internet]. Canberra: Department of Health; 2018 [cited 2018 Sep]. Available from: [www.health.gov.au/internet/ministers/publishing.nsf/Content/health-mediarel-yr2018-hunt010.htm](http://www.health.gov.au/internet/ministers/publishing.nsf/Content/health-mediarel-yr2018-hunt010.htm)
17. Australian Medical Association. Opioid prescribing letters to GPs [Internet]. Canberra: AMA; 2018 [cited 2018 Aug]. Available from: [www.ama.com.au/gp-network-news/opioid-prescribing-letters-gps](http://www.ama.com.au/gp-network-news/opioid-prescribing-letters-gps)
18. Australian Pain Society. Pain in residential aged care facilities: management strategies. 2nd edition. North Sydney: Australian Pain Society; 2018. [www.apsoc.org.au/publications](http://www.apsoc.org.au/publications) (accessed Sep 2018).

