

# 1.1 Antimicrobial dispensing

## Context

This data item examines antimicrobial dispensing for people of all ages. These data are sourced from the PBS and relate to the number of prescriptions dispensed per 100,000 people.

Antimicrobials include antibiotics, antivirals and antifungals and are used to treat microbial infections. Their use is driven by factors such as prescribing practices, patient factors, the incidence of infections and the prevalence of antimicrobial resistance.

Inappropriate prescribing of antimicrobials is common. It leads to unnecessary spending on prescriptions, a higher risk of adverse effects and increased population-level antimicrobial resistance.

Healthcare systems around the world have tried incentive payments and feedback systems to reduce unnecessary prescribing. These programs have had limited success.<sup>1</sup> In Australia, NPS MedicineWise has been working for more than a decade to reduce inappropriate prescribing.<sup>2</sup> Further reductions could be made, especially in unnecessary use of antimicrobials for upper respiratory tract infections.

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## Magnitude of variation

In 2013–14, there were 30,355,539 PBS prescriptions dispensed for antimicrobials, representing 125,119 prescriptions per 100,000 people (the Australian rate).

The number of PBS prescriptions dispensed for antimicrobials across 325\* local areas (SA3s) ranged from 14,895 to 171,841 per 100,000 people. The number of prescriptions was **11.5 times higher** in the area with the highest rate compared to the area with the lowest rate. The average number of prescriptions dispensed varied across states and territories, from 86,877 per 100,000 people in the Northern Territory, to 132,730 in Queensland.

After excluding the highest and lowest results, the antimicrobial prescription rate across the 300 remaining local areas was **1.9 times higher** in one local area compared to another.

Dispensing rates were lowest in remote communities. Generally, rates were highest in areas of lowest socioeconomic status, and decreased with increasing socioeconomic status, consistent with poorer health and higher infection rates with decreasing socioeconomic status.

There is insufficient evidence to identify which factors are driving geographic patterns of antimicrobial dispensing in Australia. For many of the common bacteria involved in community-acquired infections, rates of resistance do not vary widely.<sup>3</sup>

## Interpretation

Potential reasons for the variation include differences in:

- prescribing practices and patient expectations
- the distribution of populations with high risk of infection and high rates of antimicrobial use, such as residents of nursing homes and Aboriginal and Torres Strait Islander peoples
- the prevalence of risk factors for infection, such as household crowding and tobacco smoking
- private prescriptions, which are not included in this data.

It is also important to consider that the dispensing of antimicrobials in remote areas by some Aboriginal Health Services is not captured in the PBS database.

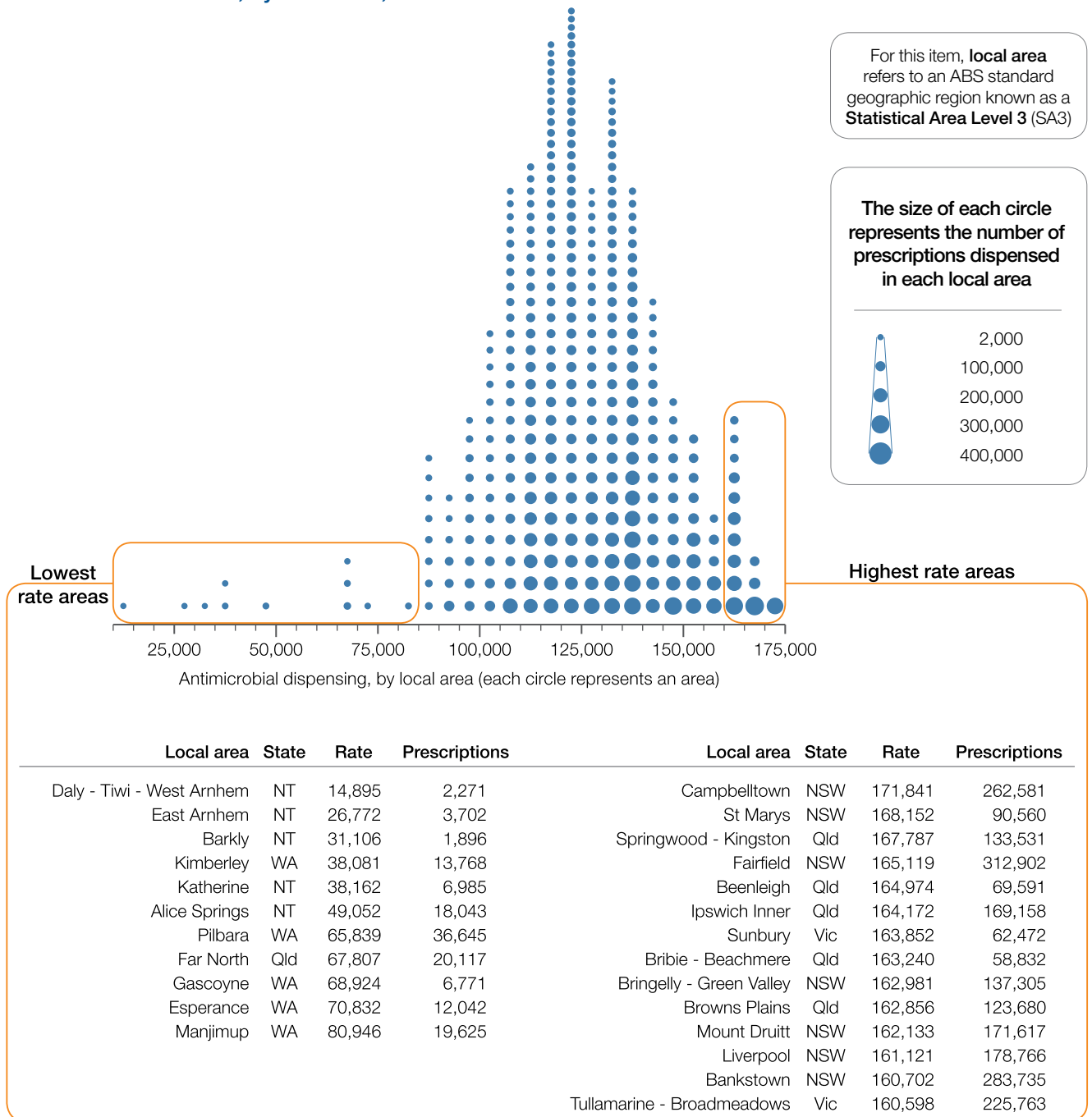
To explore this variation, further analysis could focus on:

- factors that contribute to local variations in antimicrobial dispensing. This investigation would help to explain why some areas have lower antimicrobial dispensing rates than others.

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\*There are 333 SA3s. For this item, data were suppressed for 8 SA3s. This is because of confidentiality requirements given the small numbers of prescriptions dispensed in these areas.

**Figure 2: Number of PBS prescriptions dispensed for antimicrobials per 100,000 people, age standardised, by local area, 2013–14**



**Notes:**

Rates are standardised based on the age structure of the Australian population in 2001.

State/territory and national rates are based on the total number of prescriptions and people in the geographic area.

The term local area refers to an ABS standard geographic region known as a Statistical Area Level 3 (SA3).

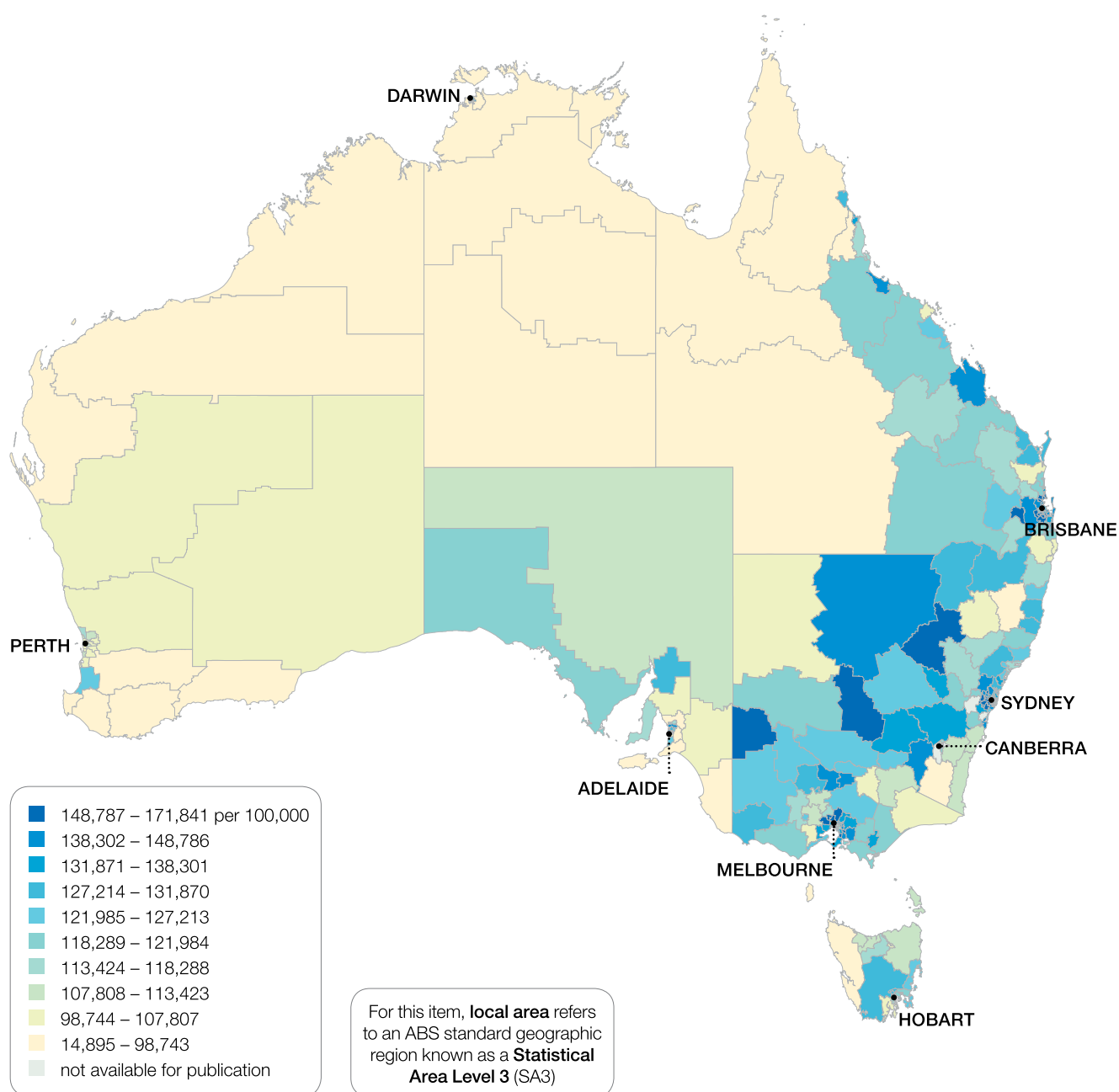
PBS prescriptions include all medicines dispensed under the PBS or RPBS, including medicines that do not receive a Commonwealth subsidy. They exclude a large proportion of public hospital drug usage, direct supply to remote Aboriginal Health Services, over-the-counter purchases and private prescriptions. SA3 analysis excludes approximately 51,660 prescriptions from GPO postcodes 2001, 2124, 3001, 4001, 5001, 6843 but these data are included in state/territory and national level analysis.

For more technical information please refer to the Technical Supplement.

**Sources:** National Health Performance Authority analysis of Pharmaceutical Benefits Scheme (PBS) statistics 2013–14 (data supplied 06/03/2015) and Australian Bureau of Statistics Estimated Resident Population 30 June 2013.

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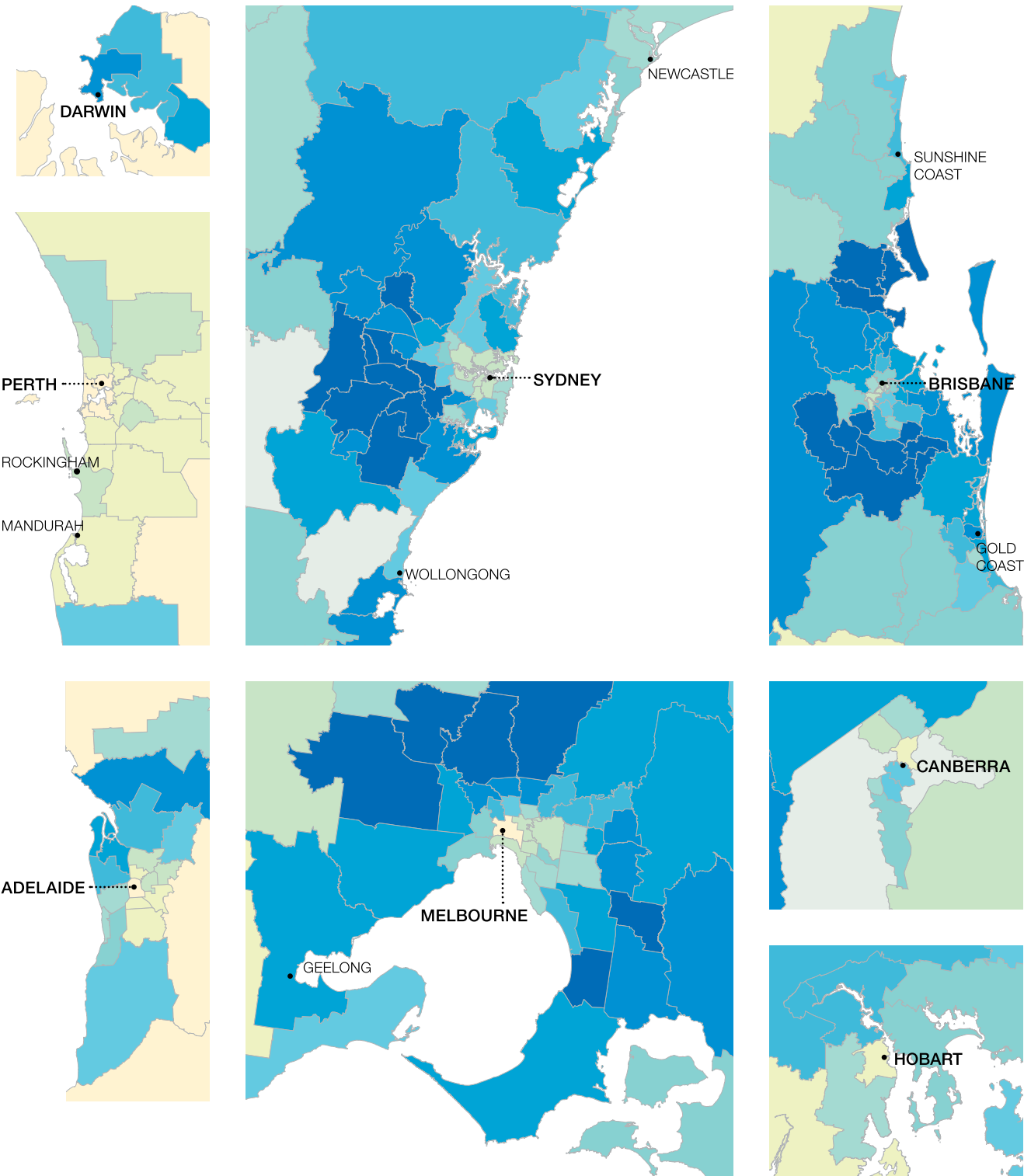
**Figure 3: Number of PBS prescriptions dispensed for antimicrobials per 100,000 people, age standardised, by local area, 2013–14**



**Sources:** National Health Performance Authority analysis of Pharmaceutical Benefits Scheme (PBS) statistics 2013–14 (data supplied 06/03/2015) and Australian Bureau of Statistics Estimated Resident Population 30 June 2013.



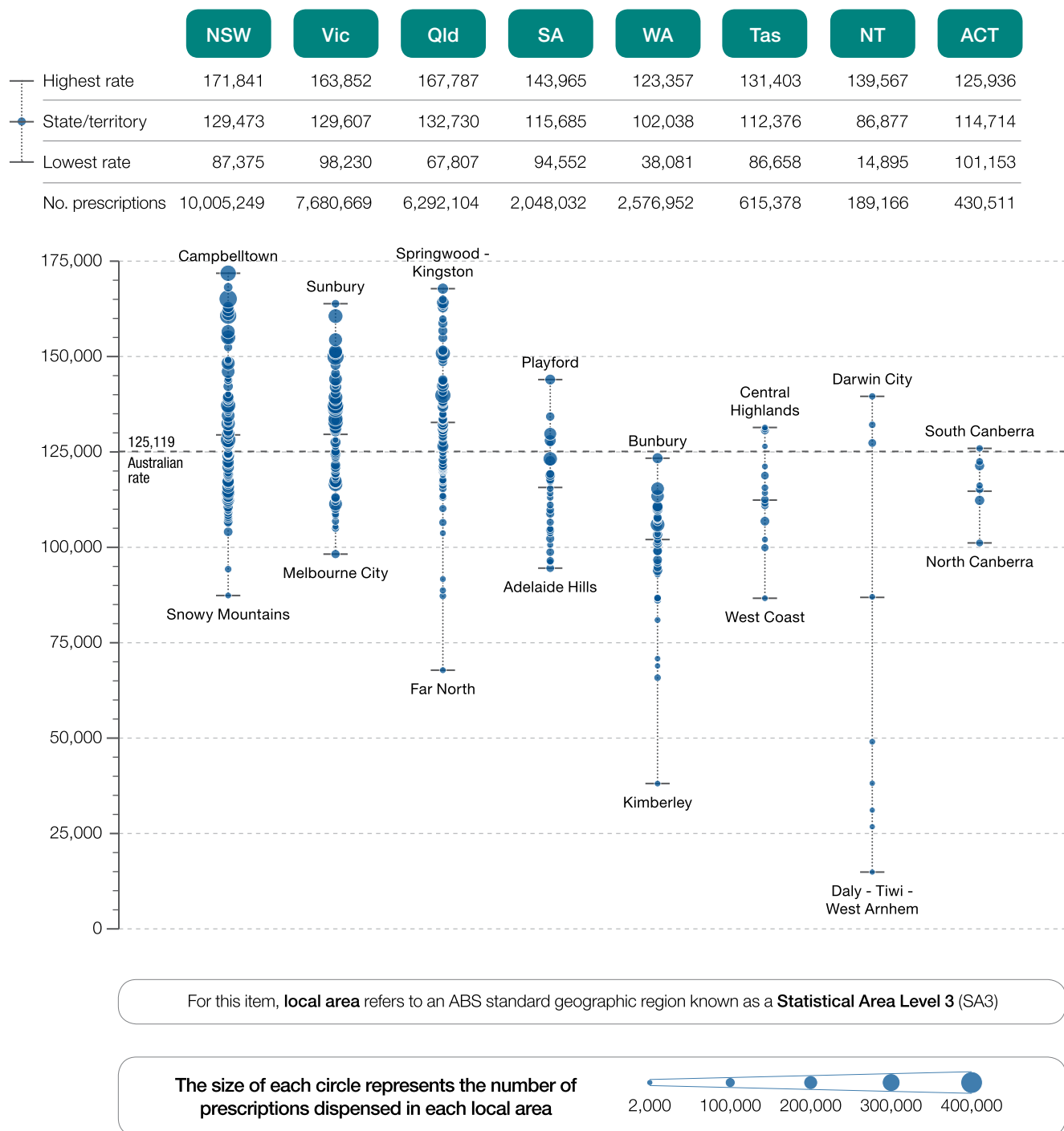
The number of PBS prescriptions dispensed for antimicrobials across 325 local areas (SA3s) ranged from 14,895 to 171,841 per 100,000 people. The number of prescriptions was **11.5 times higher** in the area with the highest rate compared to the area with the lowest rate.



Sources: National Health Performance Authority analysis of Pharmaceutical Benefits Scheme (PBS) statistics 2013–14 (data supplied 06/03/2015) and Australian Bureau of Statistics Estimated Resident Population 30 June 2013.

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**Figure 4: Number of PBS prescriptions dispensed for antimicrobials per 100,000 people, age standardised, by local area, state and territory, 2013–14**

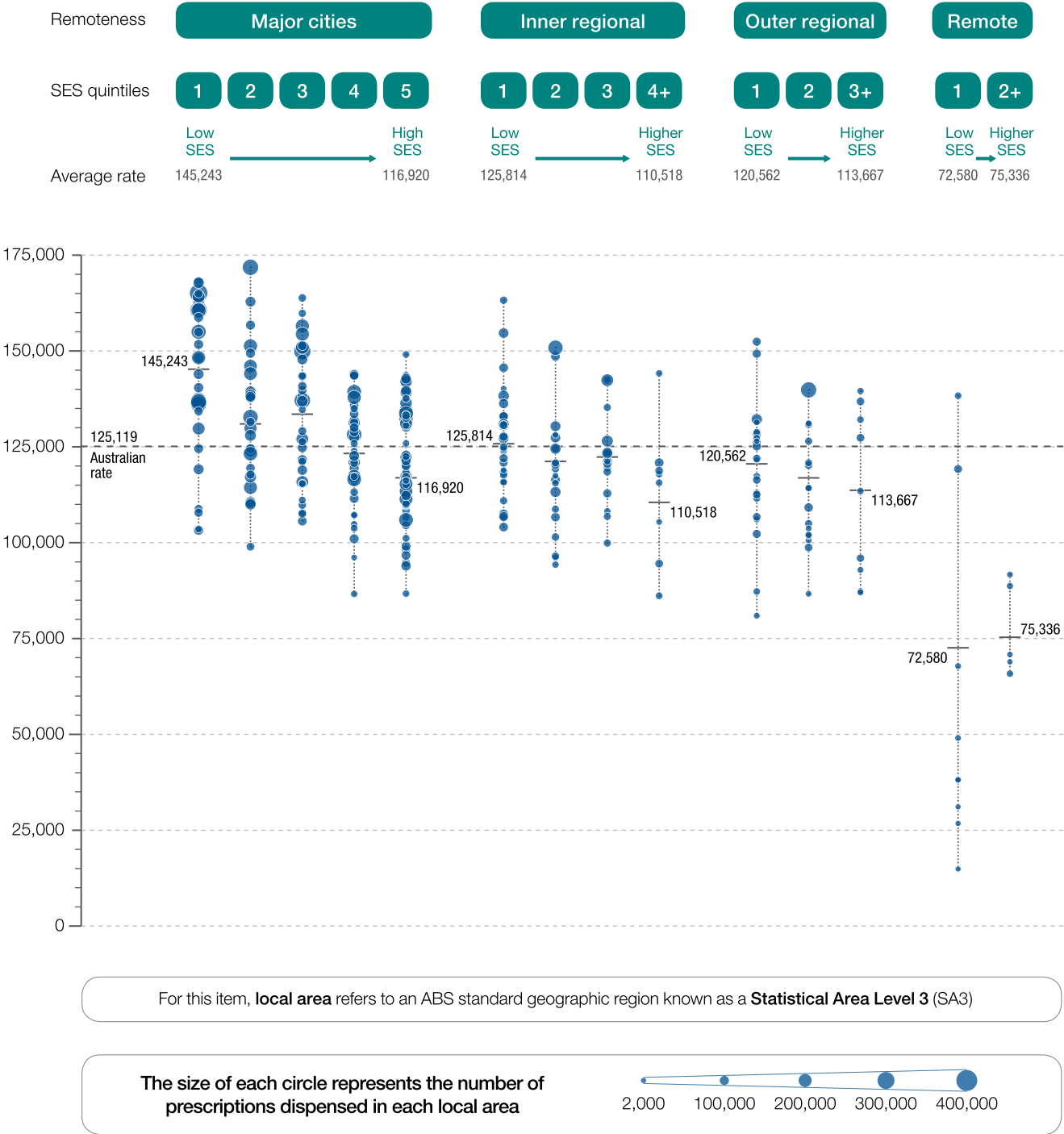


**Notes:**

Rates are standardised based on the age structure of the Australian population in 2001.  
State/territory and national rates are based on the total number of prescriptions and people in the geographic area.

**Sources:** National Health Performance Authority analysis of Pharmaceutical Benefits Scheme (PBS) statistics 2013–14 (data supplied 06/03/2015) and Australian Bureau of Statistics Estimated Resident Population 30 June 2013.

Figure 5: Number of PBS prescriptions dispensed for antimicrobials per 100,000 people, age standardised, by local area, remoteness and socioeconomic status (SES), 2013–14



**Notes:**  
Rates are standardised based on the age structure of the Australian population in 2001.  
The national rate is based on the total number of prescriptions and people in Australia.  
Average rates are based on the total number of prescriptions and people in the local areas within each group.

**Sources:** National Health Performance Authority analysis of Pharmaceutical Benefits Scheme (PBS) statistics 2013–14 (data supplied 06/03/2015) and Australian Bureau of Statistics Estimated Resident Population 30 June 2013.

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## Resources

- Therapeutic Guidelines Limited. *Therapeutic guidelines: Antibiotic*. Version 15. 2014. Available at: [www.tg.org.au/](http://www.tg.org.au/).
- Australian Medicines Handbook Pty Ltd. *Australian Medicines Handbook 2015* (online). 2015. Available at: <http://amhonline.amh.net.au/>.
- Australian Commission on Safety and Quality in Health Care. *Antimicrobial stewardship clinical care standard*. 2014. Available at: [www.safetyandquality.gov.au/our-work/clinical-care-standards/antimicrobial-stewardship-clinical-care-standard/](http://www.safetyandquality.gov.au/our-work/clinical-care-standards/antimicrobial-stewardship-clinical-care-standard/).
- Australian Government. *National antimicrobial resistance strategy 2015–2019*. 2015. Available at: [www.health.gov.au/internet/main/publishing.nsf/Content/ohp-amr.htm](http://www.health.gov.au/internet/main/publishing.nsf/Content/ohp-amr.htm).
- Australian Commission on Safety and Quality in Health Care. *National antimicrobial utilisation surveillance program*. 2014. Available at: [www.safetyandquality.gov.au/national-priorities/amr-and-au-surveillance-project/](http://www.safetyandquality.gov.au/national-priorities/amr-and-au-surveillance-project/).
- Australian Commission on Safety and Quality in Health Care. *National safety and quality health service standards*. 2012. Available at: [www.safetyandquality.gov.au/wp-content/uploads/2011/09/NSQHS-Standards-Sept-2012.pdf](http://www.safetyandquality.gov.au/wp-content/uploads/2011/09/NSQHS-Standards-Sept-2012.pdf).
- Drug Utilisation Subcommittee (DUSC) of the Pharmaceutical Benefits Advisory Committee (PBAC). *Antibiotics: PBS/RPBS utilisation*. October 2014 and February 2015. Available at: [www.pbs.gov.au/info/industry/listing/participants/public-release-docs/antibiotics-oct-14-feb-15](http://www.pbs.gov.au/info/industry/listing/participants/public-release-docs/antibiotics-oct-14-feb-15).
- Pharmaceutical Benefits Scheme. *Antibiotics Roundtable Outcomes Statement*. 2015. Available at: [www.pbs.gov.au/reviews/authority-required-files/antibiotics-roundtable-outcome-statement.pdf](http://www.pbs.gov.au/reviews/authority-required-files/antibiotics-roundtable-outcome-statement.pdf).
- Pharmaceutical Benefits Scheme. *Australian Statistics on Medicines*. 2015. Available at: [www.pbs.gov.au/info/browse/statistics](http://www.pbs.gov.au/info/browse/statistics).

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1 Meeker D, Knight TK, Friedberg MW, Linder JA, Goldstein NJ, Fox CR, et al. Nudging guideline-concordant antibiotic prescribing: a randomized clinical trial. *JAMA Intern Med*. 2014;174(3):425-31.

2 National Prescribing Service, MedicineWise. Antibiotics. 2014. (Accessed 1 September 2015 at: [www.nps.org.au/medicines/infections-and-infestations/antibiotics](http://www.nps.org.au/medicines/infections-and-infestations/antibiotics)).

3 Australian Group on Antimicrobial Resistance. AGAR Surveys. (Accessed 1 September 2015 at: [www.agargroup.org/surveys](http://www.agargroup.org/surveys)).