1.3 Amoxycillin and amoxycillin-clavulanate dispensing

Context

This data item examines amoxycillin and amoxycillin-clavulanate 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.

Amoxycillin is the most commonly dispensed antimicrobial in Australia, and in 2013 accounted for 21 per cent of systemic antimicrobial dispensing.¹ Amoxycillin is preferred for treating infections where β -lactamase producing bacteria are less common, such as most upper and lower bacterial respiratory tract infections.² These infections account for 57 per cent of all presentations in primary care where an antimicrobial agent is prescribed.³

The addition of clavulanic acid, a β -lactamase inhibitor, to amoxycillin enhances its spectrum of activity to include bacterial species commonly harbouring acquired β -lactamases, such as *Escherichia coli*, *Klebsiella* species and *Staphylococcus aureus*. The combination amoxycillin-clavulanate is the third most commonly dispensed antimicrobial in Australia.¹

Amoxycillin-clavulanate is preferred over amoxycillin for urinary tract infections. Neither is recommended for skin or skin structure infections, the two other common presentations in primary care. Amoxycillinclavulanate causes more adverse reactions than amoxycillin alone.

Amoxycillin and amoxycillin-clavulanate dispensing

Magnitude of variation

In 2013–14, there were 5,697,634 PBS prescriptions dispensed for amoxycillin, representing 24,062 prescriptions per 100,000 people (the Australian rate).

The number of PBS prescriptions dispensed for amoxycillin across 325* local areas (SA3s) ranged from 2,186 to 44,884 per 100,000 people. The number of prescriptions was **20.5 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 15,047 per 100,000 people in the Northern Territory, to 28,347 in Victoria.

After excluding the highest and lowest results, the amoxycillin prescription rate across the 301 remaining local areas was **2.7 times higher** in one local area compared to another.

In 2013–14, there were 4,621,154 PBS prescriptions dispensed for amoxycillin-clavulanate, representing 19,081 prescriptions per 100,000 people (the Australian rate).

The number of PBS prescriptions dispensed for amoxycillin-clavulanate across 325* local areas (SA3s) ranged from 1,998 to 32,058 per 100,000 people. The number of prescriptions was **16.0 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 13,740 per 100,000 people in Tasmania, to 21,979 in Queensland.

After excluding the highest and lowest results, the amoxycillin-clavulanate prescription rate across the 300 remaining local areas was **2.2 times higher** in one local area compared to another.

At the geographic level of SA3, the ratio of amoxycillin dispensed to the total of amoxycillin-clavulanate varied from 40 per cent to 60 per cent. The optimum ratio is unknown, despite evidence that for many of the common bacteria involved in community-acquired infections, rates of resistance do not vary widely.⁴

As with total antimicrobial dispensing, there was a link between higher dispensing rates of amoxycillin and amoxycillin-clavulanate and lower socioeconomic status, and lower dispensing rates with increasing remoteness. The very low dispensing rate in remote communities is most likely because medicines dispensed by remote-area Aboriginal Health Services are not captured in the PBS database.

Interpretation

Potential reasons for the variation include differences in:

- prescribing practices and patient expectations
- the distribution of populations with a 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.

To explore this variation, further analysis could focus on:

• variation in prescribing practices.

^{*}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 10: Number of PBS prescriptions dispensed for amoxycillin 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 6,340 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.

Figure 11: Number of PBS prescriptions dispensed for amoxycillin per 100,000 people, age standardised, by local area, 2013–14



The number of PBS prescriptions dispensed for amoxycillin across 325 local areas (SA3s) ranged from 2,186 to 44,884 per 100,000 people. The number of prescriptions was **20.5 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 11/02/2015) and Australian Bureau of Statistics Estimated Resident Population 30 June 2013.

Figure 12: Number of PBS prescriptions dispensed for amoxycillin 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.

Figure 13: Number of PBS prescriptions dispensed for amoxycillin 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.

Resources

- Therapeutic Guidelines Limited. *Therapeutic Guidelines: Antibiotic.* Version 15. 2014. Available at: www.tg.org.au/.
- Australian Medicines Handbook Pty Ltd. Australian Medicines Handbook 2015 (online).
 2015. Available at: http://amhonline.amh.net.au/.
- Pharmaceutical Benefits Scheme. Antibiotics Roundtable Outcomes Statement. 2015.
 Available at: www.pbs.gov.au/reviews/authorityrequired-files/antibiotics-roundtable-outcomestatement.pdf.

¹ Drug Utilisation Subcommittee (DUSC) of the Pharmaceutical Benefits Advisory Committee (PBAC). Antibiotics: PBS/RPBS utilisation: October 2014 and February 2015. Canberra: PBS, 2015.

² Antibiotic Expert Groups. Therapeutic guidelines: antibiotic. Version 15. Melbourne: Therapeutic Guidelines Limited, 2014.

³ Britt H, Miller G, Charles J, Henderson J, Bayram C, Pan Y et al. General practice activity in Australia 2010–11. Bettering the Evaluation And Care of Health. Sydney: Sydney University Press, 2011.

⁴ Australian Group on Antimicrobial Resistance surveys. AGAR Surveys. (Accessed 1 September 2015 at: www.agargroup.org/surveys).



Figure 14: Number of PBS prescriptions dispensed for amoxycillin-clavulanate 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 7,880 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.

Figure 15: Number of PBS prescriptions dispensed for amoxycillin-clavulanate per 100,000 people, age standardised, by local area, 2013–14



The number of PBS prescriptions dispensed for amoxycillin-clavulanate across 325 local areas (SA3s) ranged from 1,998 to 32,058 per 100,000 people. The number of prescriptions was **16.0 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 11/02/2015) and Australian Bureau of Statistics Estimated Resident Population 30 June 2013.

Figure 16: Number of PBS prescriptions dispensed for amoxycillin-clavulanate 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.

Figure 17: Number of PBS prescriptions dispensed for amoxycillin-clavulanate 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.

Resources

- Therapeutic Guidelines Limited. *Therapeutic Guidelines: Antibiotic.* Version 15. 2014. Available at: www.tg.org.au/.
- Australian Medicines Handbook Pty Ltd. Australian Medicines Handbook 2015 (online).
 2015. Available at: http://amhonline.amh.net.au/.
- Pharmaceutical Benefits Scheme. Antibiotics Roundtable Outcomes Statement. 2015.
 Available at: www.pbs.gov.au/reviews/authorityrequired-files/antibiotics-roundtable-outcomestatement.pdf.

¹ Drug Utilisation Subcommittee (DUSC) of the Pharmaceutical Benefits Advisory Committee (PBAC). Antibiotics: PBS/RPBS utilisation: October 2014 and February 2015. Canberra: PBS, 2015.

² Antibiotic Expert Groups. Therapeutic guidelines: antibiotic. Version 15. Melbourne: Therapeutic Guidelines Limited, 2014.

³ Britt H, Miller G, Charles J, Henderson J, Bayram C, Pan Y et al. General practice activity in Australia 2010–11. Bettering the Evaluation And Care of Health. Sydney: Sydney University Press, 2011.

⁴ Australian Group on Antimicrobial Resistance surveys. AGAR Surveys. (Accessed 1 September 2015 at: www.agargroup.org/surveys).