

AURA 2019 at a glance

[AURA 2019: Third Australian report on antimicrobial use and resistance in human health](#) is a comprehensive picture of antimicrobial resistance (AMR), antimicrobial use, and the appropriateness of antimicrobial prescribing in Australian hospitals, aged care homes, general practice and the community.

AMR contributes to patient illness and death. It increases the complexity of treatment and the duration of hospital stay, and places a significant burden on patients, health service organisations and the health system.

AURA 2019 provides information to help states and territories, private healthcare providers, general practitioners and aged care homes slow the rate of AMR, prepare for and respond to new and emerging threats, and ensure that antimicrobials are used appropriately to improve patient safety.

What information is available in AURA 2019?

AURA 2019 includes analyses of data from the [AURA Surveillance System](#), primarily from 2016 and 2017. [CARAlert](#) data are included for 2018.

It includes data about organisms that are a priority for Australia, the volume of antimicrobial use, the appropriateness of antimicrobial prescribing, key emerging issues for AMR, and a comparison of Australia's situation with other countries.

An [AURA 2019 consumer summary](#) is also available.

What is the AURA Surveillance System?

The Antimicrobial Use and Resistance in Australia (AURA) Surveillance System was developed by the Australian Commission on Safety and Quality in Health Care (the Commission) to support prevention and containment of AMR. AURA provides a comprehensive and integrated picture of patterns and trends of AMR and antimicrobial use across Australia using data from:

- [Australian Group on Antimicrobial Resistance](#)
- [Australian Passive AMR Surveillance System](#), which uses the Queensland Health OrgTRx System
- [CARAlert](#), which collects data on priority organisms that are resistant to last-line antimicrobials
- [National Antimicrobial Prescribing Survey](#)
- [National Antimicrobial Utilisation Surveillance Program](#)



For AURA 2019, data and reports were also provided by:

- The National Neisseria Network, on *Neisseria gonorrhoeae* and *N. meningitidis*
- The [National Notifiable Diseases Surveillance System](#) on *Mycobacterium tuberculosis*
- The [NPS MedicineWise MedicineInsight](#) program
- The [Pharmaceutical Benefits Scheme \(PBS\) and Repatriation Pharmaceutical Benefits Scheme \(RPBS\)](#)
- Sullivan Nicolaides Pathology, on rates of AMR from the community and private hospital settings.

What does AURA 2019 tell us about antimicrobial use and appropriateness?

Hospitals

- In 2017, total antibiotic use in hospitals that participated in the National Antimicrobial Utilisation Surveillance Program (NAUSP) increased for the first time since 2013. The usage rate increased from 932.8 defined daily doses (DDDs) per 1,000 occupied bed days (OBDs) in 2016 to 956.8 DDDs per 1,000 OBDs in 2017
- In 2017, a national shortage of piperacillin–tazobactam had a considerable impact on patterns of antibiotic use in NAUSP contributor hospitals, including increased use of cephalosporins
- The overall rate of inappropriate prescribing in hospitals that participated in the National Antimicrobial Prescribing Survey (NAPS) has been static since 2013. In 2017, 23.5% of prescriptions assessed were found to be inappropriate
- In 2017, the most common indications for prescribing antimicrobials in NAPS contributor hospitals were surgical prophylaxis, community-acquired pneumonia, medical prophylaxis, urinary tract infections and sepsis
- In 2017, the proportion of prescriptions for surgical prophylaxis that extended beyond the recommended 24 hours dropped in NAPS contributor hospitals from 41.1% in 2013 to 30.5%
- Cefalexin and amoxicillin–clavulanic acid had the highest rates of inappropriate prescribing in NAPS contributor hospitals.

Community - primary care

- In 2017, 41.5% ($n = 10,215,109$) of the Australian population had at least one systemic antibiotic dispensed under the Pharmaceutical Benefits Scheme (PBS) or Repatriation Pharmaceutical Benefits Scheme (RPBS)
- After a steady increase in the rate of antibiotic dispensing under the PBS/RPBS between 2013 and 2015, there was a decline in 2016, and a further decline in 2017
- Approximately 50% of all antibiotic prescriptions were ordered with repeats; of those repeats, approximately half were filled within 10 days of the original prescription
- The rate of systemic antibiotic prescribing in participating MedicineInsight practices has declined steadily since 2010. However, antibiotics continue to be overprescribed compared with guideline recommendations
- A large percentage of patients from participating MedicineInsight practices were prescribed antibiotics for conditions for which there is no evidence of benefit, including influenza (52.2% of patients with this condition recorded) and acute bronchitis (92.4% of patients with this condition recorded).

Community - aged care homes

- Almost 1 in 10 residents of aged care homes that participated in the [Aged Care National Antimicrobial Prescribing Survey](#) (AC NAPS) were prescribed at least one antimicrobial
- More than half of antimicrobial prescriptions in aged care homes that participated in the AC NAPS were for residents who had no signs or symptoms of infection
- Approximately one-quarter of prescriptions in 2016 and 2017 in aged care homes that participated in the AC NAPS did not include the reason for prescribing antimicrobials
- In 2016 and 2017, approximately one-third of antimicrobial prescriptions in aged care homes that participated in the AC NAPS were for topical use.

What does AURA 2019 tell us about antimicrobial resistance?

National rates of resistance for many priority organisms have not changed substantially from those reported in [AURA 2016](#) and [AURA 2017](#). However, several notable upswings in resistance are important to consider in the context of infection prevention and control, and antimicrobial prescribing.

- In *Escherichia coli*, resistances to common agents used for treatment continue to increase. Resistance to ciprofloxacin and other fluoroquinolones continued to rise in isolates from community-onset infections, despite restriction of access to these agents on the Pharmaceutical Benefits Scheme. These changes in resistance may mean increasing treatment failures and greater reliance on last-line treatments such as carbapenems
- In *Enterococcus faecium*, the overall rates of vancomycin resistance are declining nationally, although the absolute number of isolates with vancomycin resistance continues to increase
- In *Neisseria gonorrhoeae*, rates of azithromycin resistance initially remained low, with a slight upward trend from 2012 to 2015. There has been a sharp upward trend since 2015, with resistance in 2017 now at 9.3%. The total number of notifiable cases also continues to increase
- In *N. meningitidis*, the number of notifiable cases increased, and reduced susceptibility to benzylpenicillin reached almost 45% in 2017. Resistance to benzylpenicillin is now almost 6%, which may affect treatment guidelines
- In *Salmonella*, ciprofloxacin resistance in typhoidal species (*S. Typhi* and *S. Paratyphi*) exceeded 60% in 2017, confirming that ciprofloxacin should no longer be relied on for empirical treatment. These high rates are partly because of recent changes to susceptibility testing breakpoints
- In *Staphylococcus aureus*, patterns of methicillin resistance continue to evolve. Community-associated methicillin-resistant *S. aureus* has become prominent in remote and very remote regions. This requires a renewed focus on infection prevention and control in community and acute settings.

Critical Antimicrobial Resistances (CARs)

- Carbapenemase-producing Enterobacterales (CPE) were the most commonly reported critical antimicrobial resistance (CAR) in 2018
- CARs reported from aged care were predominantly CPE or daptomycin-nonsusceptible *S. aureus*
- Of CARs reported from bloodstream specimens, 81% were CPE. Oral therapies may not be available for many of these infections, and hospital-based intravenous therapy is the only treatment option
- There were large increases in multidrug-resistant *Shigella* species (from 32 isolates in 2017 to 64 isolates in 2018) and ceftriaxone-nonsusceptible *Salmonella* species (from 38 isolates in 2017 to 51 isolates in 2018)

- There were sporadic cases of ceftriaxone-nonsusceptible *N. gonorrhoeae* (no isolates in 2017 to six isolates in 2018)
- Confirmation of linezolid-nonsusceptible *Enterococcus* species almost tripled in 2018, with increases in both *E. faecium* and *E. faecalis*. A high proportion were from bloodstream isolates compared with other CARs
- Of multidrug-resistant *Mycobacterium tuberculosis*, 15% (6 of 39 isolates) were from overseas patients.

International comparisons in antimicrobial resistance

- Internationally, rates of resistance to fluoroquinolones in *E. coli* and *Klebsiella pneumoniae* (represented by resistance to ciprofloxacin) have increased between 2015 and 2017. Although resistance rates in Australia remain low compared with most European countries, fluoroquinolone resistance rates have increased compared with some countries, including the Netherlands
- Compared with European countries, rates of resistance in key gram-positive pathogens are moderate to high in Australia. The prevalence of vancomycin resistance in *E. faecium* remains higher in Australia than in any European country, even though rates have levelled off in recent years.

AURA 2019 – focus areas for improvement action

Amoxicillin–clavulanic acid and cefalexin prescribing

- Reducing inappropriate prescribing of these antibiotics, and promoting use of narrower-spectrum antibiotics such as amoxicillin, will reduce the volume of broad-spectrum antibiotic use in hospitals and the community, and contribute to preventing and containing AMR.

Chronic obstructive pulmonary disease

- Exacerbation of chronic obstructive pulmonary disease (COPD) is a common condition for which broad-spectrum antibiotics are prescribed for microbiological and/or anti-inflammatory reasons. People with COPD are prone to developing AMR in respiratory isolates
- There is a long-term trend in hospitals of high levels of inappropriate prescribing of antibiotics for exacerbation of COPD
- Targeted strategies and guidelines to improve the appropriateness of antibiotic prescribing for treatment of COPD in hospitals will require collaboration between clinicians involved in antimicrobial stewardship and the specialists managing patients with COPD.

Aged care homes

- There is a substantial burden of infection and colonisation with multidrug-resistant organisms among people living in aged care homes in Australia, and high levels of unnecessary antimicrobial prescribing and inappropriate antimicrobial use
- Aged care homes are an important community setting for monitoring AMR and antimicrobial use, because of the potential for increasing AMR as a result of the high frequency of residents moving in and out of hospitals
- Enhanced infection prevention and control, and antimicrobial stewardship efforts in aged care homes and hospitals will help to reduce transmission between these settings and improve the safety of care provided to residents.

Infection prevention and control and AMR

The National Safety and Quality Health Service (NSQHS) Standard [Preventing and Controlling Healthcare-Associated Infection](#) aims to improve infection prevention and control measures to help prevent infections, and the spread of antimicrobial resistance through the appropriate prescribing and use of antimicrobials. The actions in this Standard include evidence-based systems that include a hand hygiene program, effective cleaning and implementation of the [Australian Guidelines for the Prevention and Control of Infection in Health Care](#).

How can I find out more about AMR, antimicrobial use and the AURA Surveillance System?

More information is available at: <https://www.safetyandquality.gov.au/AURA>

About AURA

The Commission's AURA Surveillance System is funded by the Australian Government Department of Health and the states and territories. AURA supports the [National Antimicrobial Resistance Strategy 2015–19](#). To develop AURA, the Commission worked collaboratively with established programs and key stakeholders across settings to improve the coverage, capture and quality of existing surveillance programs and data collections, and to identify gaps.

About the Commission

The Australian Commission on Safety and Quality in Health Care is an Australian Government agency that leads and coordinates national improvements in the safety and quality of health care based on the best available evidence. By working in partnership with patients, consumers, clinicians, managers, policy makers and healthcare organisations, the Commission aims to ensure that the health system is better informed, supported and organised to deliver safe and high-quality care.