

AURA 2017: Second Australian Report on antimicrobial use and resistance in human health



AURA 2017

Background

Antimicrobial resistance (AMR) poses one of the most important risks to our health today. AMR occurs when an organism develops resistance to an antimicrobial that is used to treat it.

Antimicrobials are an integral component of health care delivery, and they need to be readily available and effective. When resistance emerges and the effectiveness of antimicrobials is reduced, this has a significant impact on an individual's treatment and the community more broadly. For example, if antimicrobials become ineffective, important treatments such as surgery and chemotherapy for cancer may no longer be a viable option.

As part of the Australian Government's *First National Antimicrobial Resistance Strategy 2015–2019*¹ to prevent and contain AMR, the Australian Commission on Safety and Quality in Health Care (the Commission) established the national surveillance system for Antimicrobial Use and Resistance in Australia (AURA) with funding provided by the Department of Health.

The Commission has continued to receive funding from the Department of Health to expand the data collected and conduct analyses to provide reports that will inform policy and practice.

Slowing the rate of AMR, preparing for and responding to new and emerging threats, and ensuring that antimicrobials are used appropriately are key components of the Commission's work with the states and territories, and the private sector, to ensure the safety and quality of health care in Australia.

The Commission has now released *AURA 2017: Second Australian report on antimicrobial use and resistance in human health*. This report, which is primarily focused on analyses of 2015 data, increases the comprehensiveness of the picture of antimicrobial use, resistance and the appropriateness of prescribing in Australia across all healthcare settings.

AURA 2017 – Frequently Asked Questions

1. What are microbes and antimicrobials?

The term 'microbe' includes different sorts of micro-organisms – including parasites, viruses and bacteria.

Antimicrobials are drugs which treat infections caused by these germs; antibiotics are a type of antimicrobial which affect bacteria (but not viruses).

Bacteria are present in many parts of the body, and are frequently good for our health. If there are too many bacteria, or if they grow in a place where they are not normally found, this is known as an infection. Some infections come from germs outside the body (for example, the influenza virus) but many occur due to our own 'good' bacteria multiplying in the wrong place.

2. What is antimicrobial resistance?

Antimicrobial resistance (AMR) is the process that occurs when bacteria change to protect themselves from the effects of antimicrobials. This means that the antimicrobial can no longer eradicate or stop the growth of the bacteria. Antimicrobials can be lifesaving agents in the fight against infection, but their effectiveness is diminished by inappropriate use and increasing AMR.

AMR has a direct effect on patient care and patient outcomes. It increases the complexity of treatment and the duration of hospital stay, resulting in additional burden to patients, clinicians and healthcare systems.

It is important to understand that it is not the individual that becomes resistant to antibiotics – it is the bacteria that cause the infection that can become resistant to antibiotics.

3. Why is antimicrobial resistance a worldwide concern?

AMR occurs when a microorganism develops resistance to an antimicrobial that was previously an effective treatment. As a result, infections caused by the resistant organism may need to be treated with other antimicrobials, which can have more severe side effects, be more expensive or take longer to work. In some severe cases, resistant organisms may not be able to be treated by any currently available antimicrobials.

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.

International evidence consistently demonstrates the growing effect that AMR is having on human health, and increasing numbers of infections in health service organisations and in the community are caused by resistant organisms. A significant contributor to increasing AMR is the inappropriate use of antimicrobials.

Slowing the rate of increase in resistance, preparing for and responding to new and emerging threats, and ensuring that antimicrobials are used appropriately are all components of the work undertaken by the Commission to ensure the safety and quality of health care in Australia.

4. When should antimicrobials be used?

Antimicrobials are important for the treatment and control of infectious diseases. Antibiotics used for treatment and prevention of infections are also critical to the success of complex surgery, intensive care, organ transplants, cancer chemotherapy and survival of other immunosuppressed and older people.

Australia has national guidelines to help healthcare professionals make decisions about whether to prescribe antimicrobials, which ones are appropriate, the appropriate dose, and the length of time for use.²

Despite these guidelines, data shows that antimicrobials are sometimes prescribed inappropriately – such as to treat viral infections (for example, colds or flu) where they have no benefit, or when they are not recommended because the infection will get better by itself.

We need to preserve antimicrobials and only use them when they are needed and likely to be effective. We need to ensure that the right antimicrobial is used with the right dosage for the right patient at the right time.

5. What is the AURA Surveillance System?

Comprehensive, coordinated and effective surveillance of AMR and antimicrobial use is a national priority and a critical component of the *Australia's First National Antimicrobial Resistance Strategy 2015–2019*. The Commission has developed the AURA Surveillance System to support strategies to prevent and contain AMR.

AURA coordinates data from a range of sources to provide a comprehensive and integrated picture of patterns and trends of AMR and antimicrobial use across Australia. Four core long-term surveillance programs provide the foundation for the AURA Surveillance System:

- Australian Group on Antimicrobial Resistance
- National Antimicrobial Prescribing Survey
- National Antimicrobial Utilisation Surveillance Program
- Queensland Health OrgTRx System, which provides the infrastructure for the National Passive AMR Surveillance System.

In addition, data and reports are gathered from:

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

During 2016, the Commission also established the National Alert System for Critical Antimicrobial Resistances (CARAlert) which collects surveillance data on priority organisms that are resistant to last-line antimicrobials. Chapter 5 of AURA 2017 includes information about CARAlert.

6. What information is available in AURA 2017?

AURA 2017 provides data and analysis from the AURA Surveillance System, primarily from 2015.

AURA 2017 includes data about organisms that have been determined to be 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.

This second AURA report provides an expanded view of AMR, antimicrobial use and appropriateness of prescribing in Australia. Participation in the AURA Surveillance System by both public and private healthcare providers has grown, and the increased volume of data has greatly contributed to the capacity to use the AURA Surveillance System to identify emerging issues and monitor trends. AURA now includes CARAlert, which allows the early detection of critical antimicrobial resistances and, over time, will provide information on the effectiveness of measures to promote appropriate antimicrobial use and contain AMR.

7. What are the key findings on antimicrobial use from AURA 2017?

- In 2015, around half of the Australian population (10.7 million people) had at least one antimicrobial dispensed in the community – 44.7% of the population
- More than 30 million antimicrobial prescriptions were dispensed through the PBS/RPBS in 2015 – there has been little change in this number since 2008
- Antimicrobial resistances require focused infection control effort in hospitals to reduce their spread
- On any given day in an Australian hospital in 2015, 40.5% of patients were being administered an antimicrobial; of these, 23.3% of antimicrobial prescriptions were not compliant with guidelines, and 21.9% were considered inappropriate
- Antibiotics used in hospitals for surgery (surgical prophylaxis) are often not required and are given for too long
- In 2015, 40.5% of surgical prophylaxis in hospitals was inappropriate, mainly because of incorrect duration (29.9%); incorrect dose or frequency (27.6%); or the procedure did not require antibiotics (22.0%)
- Almost 40% of cefalexin prescriptions in hospital are inappropriate, and in 2015 most inappropriate use of cefalexin was for surgical prophylaxis, urinary tract infections and pneumonia
- Data on antimicrobial prescriptions show strong seasonal variation, with some antimicrobials being prescribed more in winter for common respiratory infections
- Colds and flu are viral respiratory infections that cannot be treated with antibiotics; the use of antibiotics for these conditions exposes patients to the risk of unwanted side effects and drives antimicrobial resistance
- Prescribing of antimicrobials to treat respiratory tract infections is common – more than 60% of community patients with these conditions are prescribed an antimicrobial without the justification being recorded, and antimicrobials are usually not recommended for these conditions

- There are concerning levels of use of antimicrobials in aged care homes for residents who do not have documented signs and symptoms of infection, and there is poor documentation of the indication of antibiotics and a review or stop date.

8. What are the key findings on antimicrobial resistance from AURA 2017?

- Compared with 2014, there were increases in rates of fluoroquinolone resistance in *Escherichia coli* from blood cultures (+2.5%) and *Shigella sonnei* (+10.9%)
- Among gram-negative bacteria, rates of resistance in the community remain relatively stable compared with 2014, and are low by world standards
- The IMP-type carbapenemase is now endemic on the Australian eastern seaboard in multiple species of Enterobacteriaceae, but there is no evidence that other carbapenemases have become established in Australia – this is an infection control challenge
- Vancomycin-resistant enterococci (VRE) have emerged as a major healthcare problem in Australia; when enterococci are resistant to vancomycin, only two or three reserved antimicrobials can be used to treat serious infections.
- The proportion of vancomycin-resistant *Enterococcus faecium* isolates in Australia increased rapidly from 2005, and is now higher than that in any European country; reversing the spread of VRE in Australia will be extremely challenging
- The Queensland clone of methicillin-resistant *Staphylococcus aureus* (MRSA) has become the dominant community-associated MRSA (CA-MRSA) clone in Australia; and is now a more common cause of bloodstream infection than healthcare-associated MRSA
- A challenge for health care is that, so far, no country has found effective interventions to control the spread of CA-MRSA; effort in this area is a priority.

9. How can health consumers and patients do to help reduce AMR?

Not all infections require treatment with antibiotics.

Antibiotics will be needed to treat some bacterial infections. But many common conditions, such as colds and flu, are usually caused by viruses, which are not affected by antibiotics. If antibiotics are used for these infections, they have no benefit – but still increase the risks of resistance or other side effects.

Antibiotics should only be taken for infections caused by bacteria.

Consumers should talk to their healthcare provider about the signs and symptoms of their illness, so the best decision can be made about treatment.

Understanding some other facts about antimicrobials will also help consumers to protect themselves and our community against rising AMR, including:

- Antibiotics will not cure colds and flu – these are caused by viruses. Antibiotics are of no benefit for a viral infection, and taking them only creates the risk of unwanted side effects.
- If an antimicrobial is prescribed – especially an antibiotic – it is important that to follow the instructions on how to take the antimicrobial and how long to take it for.

- Do not use previously prescribed antimicrobials at a later date, and do not give them to others to use because this could compromise your own health or the health of others.
- Take steps to prevent the spread of infection by regularly washing your hands thoroughly with soap and running water, or rubbing them with an alcohol-based hand rub, particularly after using the toilet and before eating or preparing food.
- If you are sick, it is especially important that you wash your hands after sneezing, coughing or touching your own eyes, nose or mouth to prevent your infection persisting or becoming worse, and to prevent it from spreading to others around you.

10. How can I find out more?

For further information on AMR, antimicrobial use and the AURA Surveillance System, including consumer resources, visit www.safetyandquality.gov.au/antimicrobial-use-and-resistance-in-australia/resources

References:

¹ Australia's First National Antimicrobial Resistance Strategy: [www.health.gov.au/internet/main/publishing.nsf/Content/1803C433C71415CACA257C8400121B1F/\\$File/amr-strategy-2015-2019.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/1803C433C71415CACA257C8400121B1F/$File/amr-strategy-2015-2019.pdf)

² Antibiotic Expert Group. *Therapeutic guidelines: antibiotic, version 15*. Melbourne: Therapeutic Guidelines Limited, 2014