

ANTIMICROBIAL USE AND RESISTANCE IN AUSTRALIA (AURA) SURVEILLANCE SYSTEM

AIM

To provide an update on outputs of the Antimicrobial Use and Resistance in Australia (AURA) Surveillance System.

METHODS

The Australian Commission on Safety and Quality in Health Care (the Commission) established AURA to provide coordinated surveillance of antimicrobial resistance (AMR) and antimicrobial use (AU) across the acute and community sectors in Australia.

The Commission developed a partnership model to work with existing surveillance programs to enhance their capability and participation to improve coverage. The Commission has also established new systems, such as CARAlert, where gaps were identified. Four of the existing surveillance programs providing the foundations for AURA are:

- Australian Group on Antimicrobial Resistance
- National Antimicrobial Prescribing Surveys (NAPS)
- National Antimicrobial Utilisation Surveillance Program
- Queensland Health OrgTRx System, which provides the infrastructure for national passive AMR surveillance across all of the states, the ACT, and Mater Health Brisbane.

Data used for the AURA 2017 also includes:

- The National Neisseria Network
- The National Notifiable Diseases Surveillance System (for 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 in Queensland and Northern NSW.

In 2016, the Commission established the National Alert System for Critical Antimicrobial Resistances (CARAlert) which collects surveillance data on priority organisms that are resistant to last-line antimicrobials and reports on these resistances nationally.

AURA 2017 AREAS FOR ACTION

Areas for action arising from the analyses reported in AURA 2017 include:

Intensifying efforts to reduce unnecessary prescribing in the community (particularly URTI)

Promote implementation of antimicrobial stewardship programs in general practice and aged care homes to reduce the use of amoxicillin-clavulanate and cefalexin

Working with the Pharmaceutical Benefits Advisory Committee to examine appropriate access to amoxicillin-clavulanate, given that the bulk of prescribing for this antimicrobial is unnecessary or inappropriate.

Collaborating with the Royal Australian College of Surgeons to develop guidance for surgical prophylaxis to address suboptimal prescribing and unnecessarily prolonged use

Supporting the implementation of the Commission's guideline for acute healthcare facilities to reduce carbapenemase-producing Enterobacteriaceae (CPE)

For VRE, strict adherence to infection control guidelines and effective cleaning and sterilisation in healthcare facilities

Continuing to monitor CARs for priority organisms through CARAlert to provide near real time information for infection control and outbreak responses, and inform treatment guidelines.

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RESULTS

AURA 2017: *Second Australian report on antimicrobial use and resistance in human health*, provides a comprehensive analysis of predominantly 2015 data. The report's key findings include:

Antimicrobial use and appropriateness of prescribing

- More than 30 million antimicrobial prescriptions were dispensed through the PBS/RBS in 2015. There has been little change in this number since 2008
- More than 60% of community patients with colds and upper respiratory tract infections (URTIs) are prescribed an antimicrobial with no justification being recorded. Antimicrobials are not generally recommended for these conditions (see Figure 1)
- In aged care homes, around 20% of antimicrobial prescriptions were for residents who do not have documented signs and symptoms of infection
- 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
- 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.

Antimicrobial resistance

- Compared with 2014, there were increases in rates of fluoroquinolone resistance in *Escherichia coli* from blood cultures (+2.5%) and *Shigella sonnei* (+10.9%). Fluoroquinolone resistance in *E. coli*, continues to rise despite restricted access to this class, driven by high use of other antimicrobials
- The IMP-type carbapenemase is now endemic at a low level on the Australian eastern seaboard in multiple species of Enterobacteriaceae, but there is no evidence that other carbapenemases have become established in Australia
- The proportion of vancomycin-resistant *Enterococcus faecium* isolates in Australia increased rapidly from 2005, and is now higher than that in any European country (see Figure 2)
- 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.

Figure 1: Number and percentage of patients prescribed systemic antimicrobials by general practitioners for selected conditions, confidence intervals and acceptable range, 2015

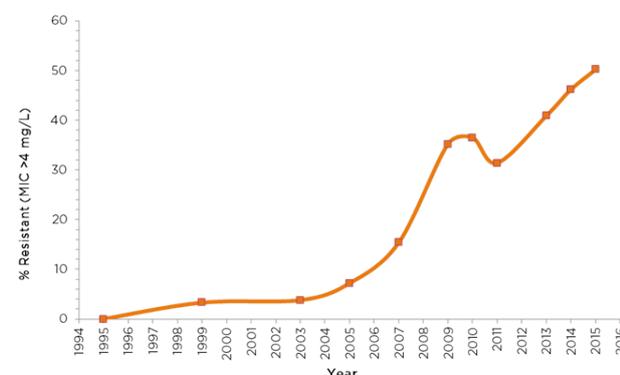
Condition	Patient	2015			Acceptable range (%)
		Number	Percentage	95% CI	
Acute URTI	Older than 1 year prescribed antibacterials*	125,291	60	58-62	0-20
Acute bronchitis or bronchiolitis	Aged 18-75 years prescribed antibacterials*	70,882	93	92-94	0-30
Acute tonsillitis	Older than 1 year prescribed antibacterials	28,687	71	69-73	0-20
	And prescribed TG-recommended penicillin V	15,772	39	37-42	80-100
Sinusitis (chronic or acute)	Older than 18 years prescribed antibacterials	48,408	91	90-92	0-20
	And prescribed TG-recommended amoxicillin	14,451	27	26-29	80-100
Acute otitis media/myringitis	Older than 2 years prescribed antibacterials	32,490	94	93-95	0-20
	And prescribed TG-recommended amoxicillin	17,835	51	50-53	80-100
Pneumonia	Aged 18-65 years prescribed antibacterials	439	90	85-94	90-100
	And prescribed TG-recommended antibiotic (for mild CAP - amoxicillin or doxycycline)	328	67	59-75	80-100
Cystitis or other UTI	Females older than 18 years prescribed antibacterials	67,375	97	97-98	80-100
	And prescribed TG-recommended trimethoprim	22,343	32	31-33	80-100

CAP = community-acquired pneumonia; CI = confidence interval; TG = Therapeutic Guidelines: Antibiotic; URTI = upper respiratory tract infection; UTI = urinary tract infection

* No antibacterials recommended by Therapeutic Guidelines: Antibiotic

Source: NPS MedicineWise (data for 2015 from 423 general practices participating in MedicineInsight)

Figure 2: Vancomycin resistance in *Enterococcus faecium* in Australia, 1995-2015



Notes:

1. Vancomycin resistance is defined as minimum inhibitory concentration >4 mg/L.

2. The sampling method and the number of contributing laboratories changed after 2010, which accounts for the initial dip in 2011.

Source: AGAR surveys

CONCLUSION

As the data available from the AURA Surveillance System continue to be enhanced, it will enable greater opportunity to understand AU and AMR in Australia and inform One Health strategy development to prevent and contain AMR.