ANTIMICROBIAL USE AND RESISTANCE IN AUSTRALIA (AURA) SURVEILLANCE SYSTEM

AIM

To promote national efforts to encourage more appropriate use of antibiotics, reduce unnecessary antimicrobial use (AU) and reduce antimicrobial resistance (AMR) in order to improve the delivery of safe, high-quality health services, and have a direct impact on patient care and patient outcomes.

The aim of the Antimicrobial Use and Resistance in Australia (AURA) Surveillance System is to provide access to data and information on AU and AMR, to inform strategies to prevent and contain AMR and reduce inappropriate use of antimicrobials.

METHODS

Developed by the Australian Commission on Safety and Quality in Health Care (the Commission), AURA is a key enabler to the Australian Government's First National AMR Strategy 2015–2019, Objective 3: Develop national coordinated One Health surveillance of AMR and antimicrobial usage.

The Commission uses a partnership model to coordinate and analyse data from the hospital sectors through existing surveillance programs. It has established new systems where gaps in data were identified, and AURA incorporates the use of community-based antimicrobial data provided by:

- The Australian Government Department of Human Services and the Department of Health Drug Utilisation Sub-Committee of the Pharmaceutical Benefits Advisory Committee
- The NPS MedicineWise MedicineInsight program, including data on rates of medicines used, prescribing indications and adherence to *Therapeutic Guidelines: Antibiotic* in general practice
- The National Centre for Antimicrobial Stewardship aged care National Antimicrobial Prescribing Survey (acNAPS).

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:

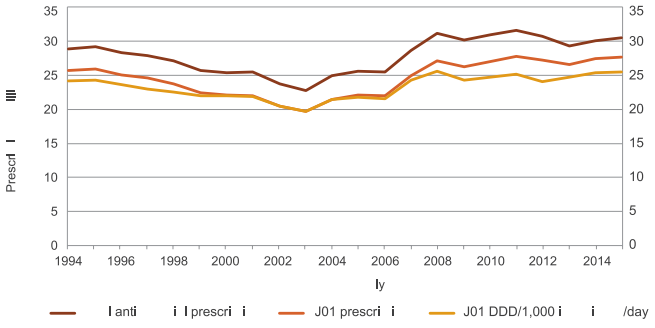
Antimicrobial use and appropriateness of prescribing in the community

- More than 30 million antimicrobial prescriptions were dispensed through the Pharmaceutical Benefits Scheme/Repatriation Pharmaceutical Benefits Scheme in 2015. There has been little change in this number since 2008 (Figure 1)
- In 2015, 30% of MedicineInsight patients (968,259 out of 3,181,923) were prescribed systemic antibiotics at least once, with women and older people more likely to receive a prescription
- The rate of dispensing in the community increased from 23.8 defined daily doses (DDDs) per 1,000 inhabitants per day in 2014 to 25.4 DDDs per 1,000 inhabitants per day in 2015
- Of patients who presented to a general practitioner for colds and other upper respiratory tract infections (URTI), 60% were prescribed an antimicrobial
- The most commonly dispensed systemic antimicrobials were amoxicillin, cefalexin and amoxicillin–clavulanate. Around 29% of amoxicillin prescribing was for URTI for which antimicrobials are rarely indicated; 15% was for otitis media where antimicrobial treatment is required only in selected circumstances
- Repeat prescriptions were frequently ordered for commonly prescribed antimicrobials, such as amoxicillin and cefalexin, where a repeat prescription is usually not needed
- Only 24% of patients prescribed an antimicrobial had a rationale recorded in their health record
- Antimicrobials prescribed were frequently not those recommended by *Therapeutic Guidelines: Antibiotic* (Figure 2).

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, the most common cause of gram-negative infections in the community, continues to rise despite restricted access to this class, probably driven by linked resistance to the widely-prescribed beta-lactams in the community
- Rates of resistance to benzylpenicillin and ciprofloxacin in Neisseria gonorrhoeae remain steady at around 20–30%. Rates of resistance to azithromycin and decreased susceptibility to ceftriaxone – the most important agent for treating gonorrhoea – are low but gradually increasing. Resistance to ceftriaxone is an emerging concern globally and failures of ceftriaxone treatment have been documented in Australia
- A 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
- Resistance in other gram-positive pathogens in the community is low (Streptococcus pyogenes) or stable (Streptococcus agalactiae and S. pneumoniae).

Figure 1: Number of antimicrobials dispensed under the PBS/RPBS, 1994-2015



Notes:

1. J01 is the ATC code for antibacterials for systemic use.

2. Data relating to the number of prescriptions dispensed before April 2012 include estimates of under co-payment and private dispensing. Data relating to the number of prescriptions dispensed after April 2012 include actual under co-payment data, but no estimate for private dispensing. The data on DDD/1,000 inhabitants/day exclude some items for which there is no DDD.

Source: Drug Utilisation Sub Committee database, 2017

Figure 2: 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 amamoxicillin	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)

CONCLUSION

Antimicrobial-resistant bacteria and their resistance genes can spread readily as people move between community and primary care services, hospitals and aged care homes. This Commission work to promote safety and quality of health care in regard to AMR will focus on strategies to slow or reverse the rate of increase in AMR, responding to new and emerging AMR threats, and promote appropriate use of antimicrobials.

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 strategy development to prevent and contain AMR.

AREAS OF ACTION FOR PRIMARY CARE

- Intensify efforts to reduce unnecessary prescribing and improve appropriateness of prescribing in general practice (particularly for URTI)
- Promote the development of national benchmarks for best-practice prescribing of antimicrobial agents in general practice
- Promote implementation of antimicrobial stewardship programs in general practice and aged care homes to eliminate unnecessary use of amoxicillin, amoxicillin–clavulanate and cefalexin
- Working with the Pharmaceutical Benefits Advisory Committee to examine appropriate access to amoxicillin–clavulanate, given that the bulk of prescribing of this antimicrobial is for conditions that do not require an antimicrobial, or for which amoxicillin alone is recommended in national guidelines.

REFERENCES

Australian Commission on Safety and Quality in Health Care. AURA 2017 – Second Australian report on antimicrobial use and resistance in human health. www.safetyandquality.gov.au/publications/second-australian-report-on-antimicrobial-use-and-resistance-in-human-health/

AUTHORS

Kathy Meleady, John Turnidge
Australian Commission on Safety and Quality in Health Care, Sydney

AURA
Antimicrobial Use and Resistance in Australia

AUSTRALIAN COMMISSION ON SAFETY AND QUALITY IN HEALTH CARE