

AURA 2021:



A resource for public health professionals

Antimicrobial resistance (AMR) is one of the greatest threats to human and animal health, as well as for food safety and agriculture. This has been recognised in <u>Australia's National</u> <u>Antimicrobial Resistance Strategy – 2020 and</u> <u>Beyond</u> and internationally, by the World Health Organization. AMR threatens the ability to provide safe healthcare now and in the future.

AMR can develop through the use of antimicrobials or exposure to AMR organisms in the environment. Unlike other medications, antibiotics can affect not only your patient but also other people and the wider community. Antibiotic use inevitably leads to resistance, but overuse of antibiotics has accelerated this process.

Resistance patterns in AURA 2021

The Fourth Australian report on antimicrobial use and resistance in human health (AURA 2021) gives the most current and comprehensive picture of AMR in Australia.

Large increases in critical antimicrobial resistances in foodborne organisms

- Multidrug-resistant *Shigella* in CARAlert increased significantly from 2018 to 2019, then declined in 2020 in association with the response to COVID-19
- Ceftriaxone-nonsusceptible *Salmonella* species declined by approximately 33% from 2019 to 2020.



What is the AURA Surveillance System and why is it important?

Monitoring and reporting on Australia's antimicrobial usage and resistance patterns over time is important to inform clinical and public health policy and practice. In Australia, this is coordinated through the <u>Antimicrobial Use and Resistance in</u> <u>Australia (AURA) Surveillance System</u>.

AURA complements existing local surveillance systems by providing data on priority organisms across Australia, including those with critical antimicrobial resistances (CARs). Priority organisms include those predominantly found in healthcare settings, such as carbapenemase-producing Enterobacterales (CPE), and those that are generally found within the community setting, such as some of the national notifiable organisms. Common multidrugresistant community organisms that AURA monitors include the foodborne organisms Shigella species and Salmonella species, and Mycobacterium tuberculosis and Neisseria gonorrhoeae.

The AURA Team at the Commission works with stakeholders to inform action at the local, state and territory, and national levels to prevent and contain the spread of AMR.

Public health professionals have an important role in containing AMR. This factsheet describes components of the AURA Surveillance System that support monitoring of communicable diseases and resistance, and inform public health action and response.

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Rapidly increasing ciprofloxacin resistance is a concern in foodborne organisms

- 58.6% of *S. sonnei* and 8.3% of *S. flexneri* isolates were resistant to ciprofloxacin
- Any resistance to ciprofloxacin in Australia is of concern, given the capacity of this organism to cause outbreaks.

Resistance in infections typically associated with overseas travel

- Ciprofloxacin resistance in *Salmonella* Typhi and *Salmonella* Paratyphi exceeded 78%. Ciprofloxacin should no longer be relied on for empirical treatment
- 5% (2/40) of multidrug-resistant *Mycobacterium tuberculosis* cases in CARAlert in 2019-2020 were from patients residing overseas.

The epidemiology of methicillin resistance continue to evolve in *Staphylococcus aureus*.

• Clones are rapidly evolving, and communityacquired methicillin-resistant *S. aureus* has become prominent everywhere, especially in remote and very remote regions. This requires a renewed focus on infection prevention and control in community and acute settings.

Antibiotic resistance is increasing in *Neisseria* gonorrhoeae

- Azithromycin-nonsusceptible N. gonorrhoeae with high level resistance (MIC ≥256 mg/L) declined in CARAlert between 2019 and 2020. However, the total number of notifiable cases continued to increase.
- There were seven reports of ceftriaxonenonsusceptible *N. gonorrhoeae* in 2019–2020.

Carbapenemase-producing *Enterobacterales* (CPE)

- CPE epidemiology continues to evolve. The IMP, NDM and OXA-48-like types accounted for 96% of all *Enterobacterales* in CARAlert, either alone or in combination in 2019 and 2020.
- Eight different CPE types were reported in CARAlert during 2019–2020. There were notable regional differences in the distribution of CPE. Compared with 2019, in 2020, IMP types decreased by 21%, NDM types decreased by 29%, and OXA-48-like CPE decreased by 34%.

Species	Critical resistance	State or territory								
		NSW	Vic	Qld	SA	WA	Tas	NT	АСТ	Total
Enterobacterales	Carbapenemase-producing	560	502	312	65	61	6	10	18	1,534
Mycobacterium tuberculosis	$Multidrug ext{-resistant}^{^{+}}$	20	9	3	1	2	0	2	3	40
Neisseria gonorrhoeae	Azithromycin-nonsusceptible LLR	381	181	72	0	35	0	3	19	691
	Azithromycin-nonsusceptible HLR	2	1	3	0	1	1	0	0	8
	Ceftriaxone- nonsusceptible	2	4	0	0	1	0	0	0	7
Shigella species	Multidrug-resistant*	229	242	112	9	27	0	4	7	630
Salmonella species	Ceftriaxone-nonsusceptible	26	7	24	5	12	0	1	0	75

Table 1. Number of selected critical antimicrobial resistances (CARs) reported in the National Alert System for Critical Antimicrobial Resistances (CARAlert), by state and territory, 1 January 2019 to 31 December 2020

 $HLR = high-level resistance, MIC \ge 256 mg/L; LLR = low-level resistance, MIC < 256 mg/L; * Resistant to any three of ampicillin, ciprofloxacin, co-trimoxazole, or ceftriaxone/cefotaxime; + Resistant to at least rifampicin and isoniazid (with or without resistance to the other two first-line agents)$

Source: AURA 2021. CARAlert was established by the Commission in 2016 and captures resistance data on a number of organisms with critical antimicrobial resistances (CARs) that may not be commonly reported elsewhere. Local operating procedures for laboratories and state and territory reporting requirements may differ. Full details of all CARs reported to CARAlert in 2019 and in 2020 can be found in AURA 2021.

How the AURA Surveillance System supports public health policy and practice

- Information about resistance patterns and antimicrobial use that can inform individual treatment options and public health response is available through the range of <u>AURA</u> and <u>CARAlert</u> reports
- Consider the reports on antimicrobial use when assessing patterns of local or jurisdictional resistance
- Discuss new or emerging resistances in your jurisdiction with other states and territories to assess cross-border issues
- Contact your state or territory CARAlert officers for any queries about your reports. Local officers can access confirmed CARs directly through an online portal and receive real-time email notification of each confirmed CAR in their jurisdiction. It is also possible to liaise directly with the laboratories to access further epidemiological and microbiological information for patient follow up.

Further information

For more on the AURA Surveillance System please visit <u>https://www.safetyandquality.gov.au/AURA</u>

Contact AURA@safetyandquality.gov.au with enquiries

