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MEDIA RELEASE

MAJOR ANTIMICROBIAL RESISTANCE THREATS TO AUSTRALIA

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THE global rise of antimicrobial resistance presents unique threats to Australia, and a "black hole in surveillance" highlighted the need to "implement nimble, cross-sectoral and collaborative systems that are fit for purpose in the 21st century", according to the authors of a Perspective published today by the *Medical Journal of Australia*.

"While a high level of health care is enjoyed by most Australians, there is currently a large reservoir of antimicrobial resistance (AMR) both within Australia and at our doorstep," wrote Associate Professor Deborah Williamson, Deputy Director of the Microbiological Diagnostic Unit Public Health Laboratory and colleagues.

The authors described four pathogens that are highly resistant, and emerging, but are not yet endemic in Australian health care and community settings.

In health care facilities, those threats are:

- carbapenemase-producing *Enterobacteriales* (CPE): resistant to carbapenems and a range of other antimicrobials, limiting treatment options to one or two less efficacious (and often more toxic) alternatives — or in some cases, no alternatives. Mortality rates of about 40% have been reported for infections caused by CPE, making these pathogens a critical public health threat. The number of CPE reported in Australia increased from 527 in 2017 to 603 in 2018, a relative change of 14.4%;
- *Candida auris*, a yeast: high crude mortality rates associated with invasive infections (up to 50%); resistance to several antifungals, particularly triazole antifungals and amphotericin B; difficulties in laboratory identification; and widespread patient-to-patient transmission, facilitated by environmental contamination. *C. auris* in Australia has been associated with overseas acquisition however ongoing vigilance, including screening of patients with recent exposure to overseas health care facilities, is required to prevent endemicity in Australia.

Threats in the community:

- drug-resistant typhoid from a Pakistan province, and thought to be acquired from *Escherichia coli.* "To date, no outbreak-associated cases have been formally reported in Australia, although cases have been reported in the United Kingdom and the United States. It is imperative that travellers to Pakistan and clinicians treating patients returning from this region are aware of these heightened health risks";
- *N. gonorrhoeae*, resistant to the two dual first line treatments, ceftriaxone and azithromycin. Between February and April 2018, three cases of extensively drug-resistant N. gonorrhoeae were described: one in the UK and two epidemiologically unrelated cases in Australia. All three isolates were highly related, suggesting circulation of this clone in South-East Asia. "In the face of dramatically increasing gonorrhoea notifications in Australia (from 66.9 to 125.9 notifications per 100 000 population in 2014 and 2018, respectively), a concerted national effort is required … including reducing the number of circulating cases, as spread of AMR is directly proportional to prevalence".

"Advances in genomic technology provide unparalleled opportunities to move existing surveillance systems beyond number-counting, and enable real-time information on the relatedness of hospital and community-associated AMR pathogens across jurisdictions," Williamson and colleagues wrote.

"However, there is presently no formal national mechanism for rapid, real-time sharing and analysis of AMR-related genomic and epidemiological data across [Australian] jurisdictions, creating a major risk for successful implementation of one of the pillars of the 2015–2019 National Antimicrobial Resistance Strategy — the development of nationally coordinated One Health surveillance of AMR."

Additionally, they wrote, laboratories are shooting themselves in the foot.

“The widespread adoption of culture-independent diagnostic testing for many pathogens (eg, *N. gonorrhoeae*, *Salmonella spp.*, *Shigella spp*.) hampers the ability of laboratories to detect AMR in these pathogens, creating a black hole in AMR surveillance,” Williamson and colleagues wrote.

“As strategies are put in place internationally (including the use of real-time genomic surveillance) to effectively prevent, detect and treat AMR pathogens, it is critical that Australia also implement nimble, cross-sectoral and collaborative systems that are fit for purpose in the 21st century.”

Please remember to credit *The MJA*.

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