Identifying the true danger of antimicrobial resistance in Australian kids

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One out of every 10 children with a bloodstream infection are infected with a multi-drug resistant organism in the nation's first-ever surveillance study investigating the prevalence of pediatric antimicrobial resistance

(AMR).

The Australian Group on Antimicrobial Resistance (AGAR) Kids Report, prepared by the Wesfarmers Center of Vaccines and Infectious Diseases, based at Telethon Kids Institute, uses data collected from 38 laboratories throughout the country to identify the strains of bacteria responsible for sending kids to hospital.

Identified by the World Health Organization as one of the top global public health and development threats, AMR occurs when bacteria develop a defense mechanism to avoid antibiotics and is expected to claim 10 million lives by 2050.

Lead author and infectious diseases epidemiologist, Ms. Anita Williams, said antimicrobial resistance among kids is a serious and growing problem that is likely to cause many infection-related hospital admissions and deaths in the future.

"To date, there has not been a national snapshot available on AMR in Australia, so we evaluated 1,700 bacteria samples collected throughout 2020–2021 from Australian kids and teenagers," said Ms. Williams.

"For the first time ever, we were able to identify bacterial infections and antibiotic resistance across different antibiotics by age, sex and state or territory—providing an essential benchmark for all future research in this field."

The key findings of the AGAR Kids study, published in *Communicable Disease Intelligence*, demonstrated that 9.4% of the bacteria causing bloodstream infections were multi-drug resistant, and pin-pointed Staphylococcus aureus—known as golden staph or S. aureus—as the most common bacteria found in children over the age of one nation-wide.

The Northern Territory recorded the highest rate of methicillin-resistance, or MRSA, at 45%, followed by Western Australia at 19%.

E. coli was the most frequently reported bacteria in patients under 12 months of age, with the highest proportion of antibiotic resistance found in Victoria.

"The study gives us valuable insight into how AMR varies according to geographic location, which can help guide localized treatment recommendations, but it also tells us that no matter the location—all children are at risk of resistant infections." said Ms. Williams.

"Now that we have a baseline for monitoring AMR in children, the study can be replicated to examine larger data sets over longer time periods to tackle this very concerning health issue."

Professor Chris Blyth, pediatric infectious diseases physician and Center Head of the Wesfarmers Center of Vaccine and Infectious Diseases, says this first-of-it-kind study will help health professionals determine optimal treatment for children with blood stream infections and improve treatment outcomes.

"Monitoring pediatric bacteria will also help us learn more about the cause of invasive infections and inform future treatment and prevention strategies by targeting at-risk age groups in higher-risk states and territories," Professor Blyth said.

"It also highlights that Australian children are at risk of multi-drug resistant organisms—efforts to tackle AMR and improve antibiotic use must be prioritized."

More information: Anita Williams et al, Australian Group on Antimicrobial Research surveillance outcome programs – bloodstream

infections and antimicrobial resistance patterns from patients less than 18 years of age, January 2020 – December 2021, *Communicable Diseases Intelligence* (2024). DOI: 10.33321/cdi.2024.48.32

Agar Kids Report, 2020-2021: agargroup.org.au/wp-content/up … l_Final_03102023.pdf

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