

Antibiotics for common childhood infections no longer effective in many parts of the world, finds study

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Dr Phoebe Williams is an Infectious disease specialist working to reduce antimicrobial resistance. In the photo she is working in Kenya. Credit: Hamish Gregory.

A new study has found that drugs to treat common infections in children and babies are no longer effective in large parts of the world, due to high rates of antibiotic resistance.

The University of Sydney-led study found many antibiotics recommended by the World Health Organization (WHO) had less than 50% effectiveness in treating childhood infections such as pneumonia, sepsis (bloodstream infections) and meningitis. The findings show global guidelines on [antibiotic use](#) are outdated and need updates.

The most seriously affected regions are in Southeast Asia and the Pacific, including neighboring Indonesia and the Philippines, where thousands of unnecessary deaths in children resulting from antibiotic resistance occur each year.

The WHO has declared that [antimicrobial resistance \(AMR\)](#) is one of the top 10 global [public health](#) threats facing humanity. In newborns, an estimated three million cases of sepsis occur globally each year, with up to 570,000 deaths. Many of these are due to lack of effective antibiotics to treat resistant bacteria.

The findings, published in *The Lancet regional Health—Southeast Asia*, add to mounting evidence that common bacteria responsible for sepsis and meningitis in children are often resistant to prescribed antibiotics.

The research reveals the urgent need for global antibiotic guidelines to be updated, to reflect the rapidly evolving rates of AMR. The most recent guideline from The World Health Organization [was published in 2013](#).

The study found that one antibiotic in particular, ceftriaxone, was likely to be effective in treating only one in three cases of sepsis or meningitis in newborn babies. Ceftriaxone is also widely used in Australia to treat

many infections in children, such as pneumonia and urinary tract infections.

Another antibiotic, gentamicin, was found likely to be effective in treating fewer than half of all sepsis and meningitis cases in children.



A paediatric ward in the Philippines. The large 'cohort' signs indicate all the babies present are sick with multi-drug resistant infections. Credit: Phoebe Williams.

Gentamicin is commonly prescribed alongside aminopenicillins, which

the study showed also has low effectiveness in combating bloodstream infections in babies and children.

Lead author Dr. Phoebe Williams from the University's School of Public Health and Sydney Infectious Diseases Institute is an infectious disease specialist whose research focuses on reducing AMR in high-burden health care settings in Southeast Asia. She also works as a clinician in Australia. Dr. Williams says there are increasing cases of multidrug-resistant bacterial infections in children around the world.

AMR is more problematic for children than adults, as new antibiotics are less likely to be trialed on and made available to children. Dr. Williams says the study should be a wake-up call for the whole world, including Australia.

"We are not immune to this problem—the burden of anti-microbial resistance is on our doorstep," she said. "Antibiotic resistance is rising more rapidly than we realize. We urgently need new solutions to stop invasive multidrug-resistant infections and the needless deaths of thousands of children each year."

The study analyzed 6,648 bacterial isolates from 11 countries across 86 publications to review antibiotic susceptibility for common bacteria causing childhood infections.



A paediatric ward in the Philippines. The large 'cohort' signs indicate all the babies present are sick with multi-drug resistant infections. Credit: Phoebe Williams.

Dr. Williams said that the best way to tackle [antibiotic resistance](#) in childhood infections is to make funding to investigate new antibiotic treatments for children and newborns a priority.

"Antibiotic clinical focus on adults and too often children and newborns are left out. That means we have very limited options and data for new treatments," she noted.

Dr. Williams is currently looking into an old antibiotic, fosfomycin, as a temporary lifeline to treat multidrug-resistant [urinary tract infections](#) in children in Australia.

She is also working with the WHO's Pediatric Drug Optimization Committee to ensure children have access to antibiotics to treat multidrug-resistant infections as soon as possible, to reduce deaths due to AMR among children.

"This study reveals important problems regarding the availability of effective antibiotics to treat serious infections in [children](#)," says senior author Paul Turner, director of the Cambodia Oxford Medical Research Unit at Angkor Hospital for Children, Siem Reap and professor of pediatric microbiology at the University of Oxford, UK. "It also highlights the ongoing need for high quality laboratory data to monitor the AMR situation, which will facilitate timely changes to be made to treatment guidelines."

More information: Coverage gaps in empiric antibiotic regimens used to treat serious bacterial infections in neonates and children in Southeast Asia and the Pacific, *The Lancet Regional Health—Southeast Asia* (2023). [DOI: 10.1016/j.lansea.2023.100291](https://doi.org/10.1016/j.lansea.2023.100291)

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