

Antibiotic resistance in children is high and associated with previous antibiotic use

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Antibiotic resistance in children with urinary infections is high and could render some antibiotics ineffective as first-line treatments, warns a study published by *The BMJ* today.

Antimicrobial resistance is an internationally recognised threat to health. Throughout the world, [children](#) are frequent consumers of antibiotics—and such routine use has been shown to increase the probability of antibiotic resistance in adults with [urinary tract infections](#).

Yet little is known about the prevalence of [bacterial resistance](#) in children or the [risk factors](#) of importance in this group.

So a team of UK researchers from University of Bristol and Imperial College London set out to review studies investigating the prevalence of [antibiotic resistance](#) in urinary tract infections caused by *Escherichia coli*, a bacterium responsible for over 80% of all urinary tract infections in children. The team also set out to measure the association between previous exposure to antibiotics and subsequent resistance in the same child.

They reviewed the results of 58 observational studies in 26 countries involving over 77,000 *E. coli* samples. Although observational studies cannot tell us about cause and effect, meta-analysis of observational data is useful for pulling evidence together.

The results show a high global prevalence of resistance—to some of the

most commonly prescribed antibiotics in primary care—in urinary tract infections in children caused by *E coli*.

Results were categorised by the OECD (Organisation for Economic Co-operation and Development) status of the study country as antibiotics tend to be used differently in these groups.

Within OECD countries, half of all samples were resistant to ampicillin (amoxicillin), a third to co-trimoxazole, and a quarter to trimethoprim. Resistance was substantially greater in non-OECD countries.

Lead author Ashley Bryce, PhD student at the Centre for Academic Primary Care, University of Bristol highlights that "Prevalence of resistance to commonly prescribed antibiotics in primary care in children with urinary tract infections caused by *E coli* is high, particularly in countries outside the OECD, where one possible explanation is the availability of antibiotics over the counter."

Dr Céire Costelloe, who co-led the research at the Health Protection Research Unit in Healthcare Associated Infections and Antimicrobial Resistance at Imperial College London, points out that "the results also suggest previous antibiotic use increased the subsequent risk of *E coli* resistance to that particular antibiotic—for up to six months after treatment."

In an accompanying editorial, Professor Grant Russell at Monash University in Australia describes how this review joins a host of recent studies, reports, and calls to action on this issue presenting "compelling evidence of the need to reconsider current approaches to community based management of paediatric urinary tract infection."

However, he concludes: "While I have no doubt that clinical practice guidelines will quickly be able to accommodate the findings, I am less

confident that there is the will and commitment to deal with what the WHO has called "the post-antibiotic era."

More information: Global prevalence of antibiotic resistance in paediatric urinary tract infections caused by Escherichia coli and association with routine use of antibiotics in primary care: systematic review and meta-analysis, www.bmj.com/cgi/doi/10.1136/bmj.i939

Antibiotic resistance in children with E coli urinary tract infection, www.bmj.com/cgi/doi/10.1136/bmj.i1399

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