'Implementation science' critical to reducing antibiotic resistance

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Despite scientific evidence on how to properly prescribe antibiotics, clinicians routinely diverge from these processes in their actual practices, and implementation science principles can inform stewardship efforts to ensure the appropriate use of antibiotics, according to a new white paper in *Infection Control & Hospital Epidemiology*, the journal of

the Society for Healthcare Epidemiology of America.

"This evidence-practice gap contributes to the public health crisis of antibiotic resistance which leads to 23,000 preventable deaths each year," says lead author Daniel Livorsi, M.D., M.Sc., Assistant Professor of Medicine at the University of Iowa Carver College of Medicine and Medical Director of Antimicrobial Stewardship at the Iowa City Veterans Administration Medical Center. "We believe that reframing antibiotic stewardship strategies as implementation strategies will demonstrate how the fields intersect and will encourage researchers to bring the same rigor to research on stewardship strategies as is applied to implementation strategies."

Each year in the United States, at least 2 million people become infected with a drug-resistant bacteria, leading to over 23,000 preventable deaths, according to the Centers for Disease Control and Prevention. The most widely prescribed type of medication, antibiotics have been routinely overprescribed and misused, losing their effectiveness as drug-resistant bacteria proliferate globally. As a result, many minor, treatable infections become life-threatening.

The authors define implementation science as "the scientific study of methods to promote the systematic uptake of proven clinical treatments, practices, and management interventions into routine practice, and hence to improve health." The field originated in response to the growing recognition of how difficult it is to translate research into routine use.

The paper outlines the steps involved in designing and conducting an implementation research study in support of antibiotic stewardship. It discusses the importance of pre-implementation activities, including stakeholder engagement, understanding the reasons for the evidence-practice gap, and selecting implementation strategies. The paper also outlines how to evaluate the implementation process to see whether the

implementation strategies were successful.

The authors cite several existing antibiotic stewardship efforts and describe how implementation science could apply to them. In one example, they describe how various implementation frameworks could be applied to an intervention to reduce antibiotic prescribing for viral acute respiratory infections in an emergency department network.

"Our hope is that the paper encourages researchers to engage a broader range of literature to examine the full extent of implementation in various clinical contexts. In addition to enhancing research on stewardship implementation, we think our paper can provide antibiotic stewardship programs with concrete, practical assistance," says Livorsi.

More information: Daniel J. Livorsi et al, Leveraging implementation science to advance antibiotic stewardship practice and research, *Infection Control & Hospital Epidemiology* (2021). DOI: 10.1017/ice.2021.480

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