Bacterial resistance to two critical antibiotics widespread in Southeast Asia

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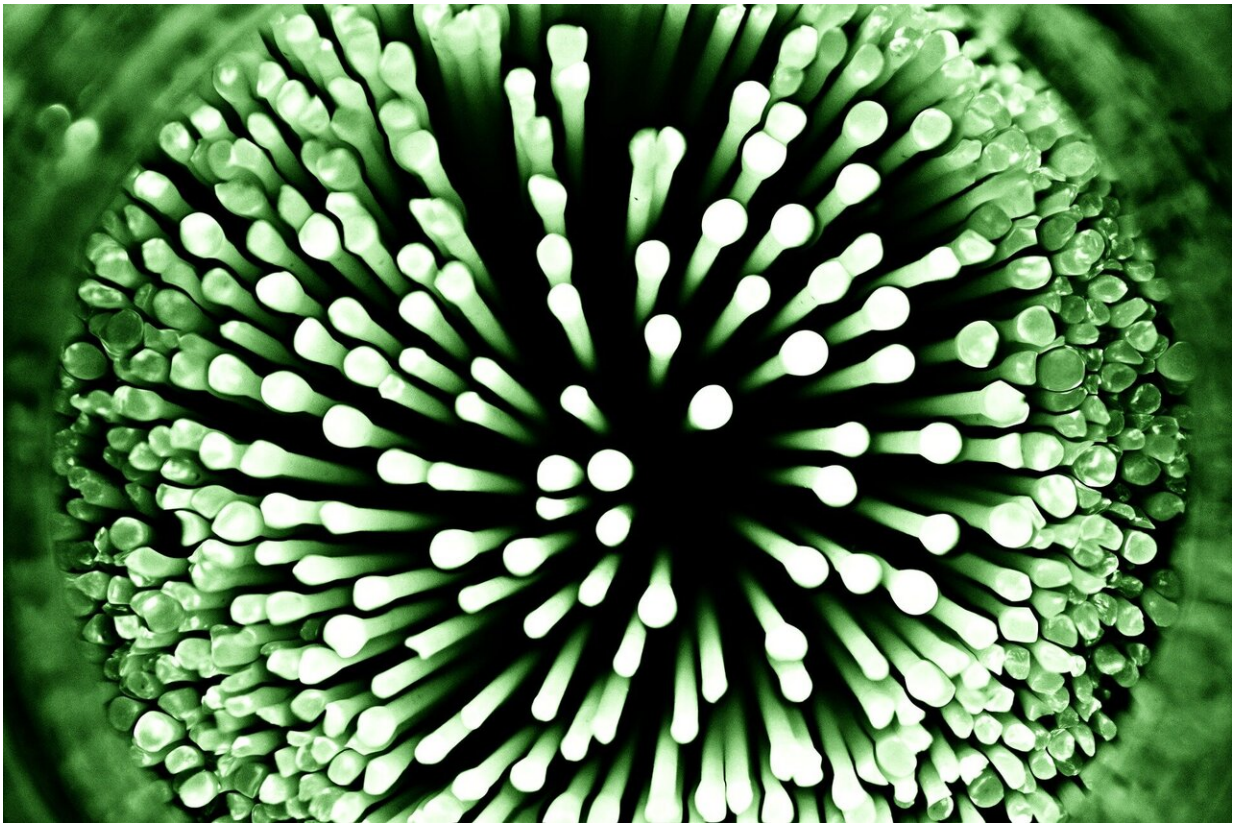

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Resistance to two critical antibiotic types, one a "drug of last resort" when all others fail against some "superbugs," are widely distributed in Southeast Asia, raising the risk of untreatable infections, say a team of

investigators led by Georgetown University Medical Center.

The study, published in the *International Journal of Antimicrobial Agents*, is a comprehensive analysis of resistance to two critical classes of drugs, carbapenems and polymyxins, in eleven nations of Southeast Asia.

The World Health Organization (WHO) has urgently called for global surveillance of antibiotic resistance, and, along with U.S. Centers for Disease Control and Prevention (CDC), identified resistance to these drugs as critical threats. To help better understand the risk in Southeast Asia, the researchers searched widely, extracting and analyzing available international scientific and clinical data. They evaluated resistance to these drugs among E. coli and Klebsiella, two common bacteria that can cause severe infections in humans, particularly in health care settings.

"The picture the data paints is of a serious emerging public health threat. We document that resistance to each drug is geographically widespread in the region, including many areas where the distribution of strains resistant to each type of antibiotic overlaps," says the study's senior investigator, infectious disease specialist Jesse Goodman, MD, MPH, a professor of medicine and director of Georgetown's Center on Medical Product Access, Safety and Stewardship (COMPASS).

The investigators' findings included that resistance to carbapenems, often at significant levels, and resistance to polymyxins, were each widespread and geographically overlapped in 8 countries. Both bacteria also carry and can spread "mobile genetic elements" which can contain genes responsible for conferring resistance that may be transmitted to other bacteria, facilitating the rapid spread of resistance.

Carbapenems have, until recently, been the "go to" treatment for E. coli and Klesiella resistant to more commonly used drugs. However, carbapenem resistant strains have spread around the world. The only

available "drugs of last resort" to treat many carbapenem resistant infections have been polymyxins, including colistin. Unfortunately, Goodman says, "in the last few years we have seen the shocking global emergence of colistin resistance, particularly in Asia, in part likely related to use of these drugs in food animal production."

"Although combined carbapenem and colistin resistance is fortunately still rare, the coexistence of mobile resistance genes for both drugs in the same areas, such as we describe, raises the risk of organisms acquiring both, causing essentially untreatable infections."

As the study notes, "These findings highlight the urgent need for sufficiently resourced robust antimicrobial resistance surveillance."

Goodman adds, "we need to enhance infection prevention, treatment and control practices, and related research and development globally, and ensure we use our remaining precious antibiotics wisely. This challenge is global in reach, scope and solutions."

More information: Marissa D. Malchione et al. Carbapenem and Colistin Resistance in Enterobacteriaceae in Southeast Asia: Review and Mapping of Emerging and Overlapping Challenges, *International Journal of Antimicrobial Agents* (2019). DOI: 10.1016/j.ijantimicag.2019.07.019

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