

2019 Thomas C. Alber Science & Engineering for Global Health Fellow

Kathleen Kurowski, MPH Candidate in Infectious Disease and Vaccinology

Katie Kurowski is an MPH student in the Infectious Disease and Vaccinology program, interested in infectious disease in a global context. After graduating from Elon University with a degree in Biology, Katie spent two years doing stem cell research focusing on ALS at Cedars-Sinai Medical Center. She developed a passion for public health while studying abroad in Cape Town, South Africa, where she learned how widespread tuberculosis and other infectious diseases are in South Africa and the effects they had on the culture and development of the country. Katie will be spending the summer in Quito, Ecuador, where she will be working with Dr. Jay Graham to study the effects of economic and WASH determinants on the carriage of antimicrobial resistant E. coli in children.



Fellowship Proposal

Antimicrobial resistance (AMR), especially among Enterobacteriaceae, is a significant global health problem, leading to increases in morbidity, mortality and healthcare costs. The threat of AMR in low to middle-income countries is especially dire due to an increasing prevalence of infections that are not treatable by last-line antimicrobials. AMR in bacteria develops from a wide variety of risk factors, including misuse of antimicrobials and environmental exposures to bacteria from livestock that are treated with antimicrobials. AMR is often examined in hospital settings, however, community-acquired AMR has been poorly described in terms of what risk factors are driving it. Poor water, sanitation, and hygiene (WASH) conditions, as well as low socioeconomic status (SES) have been found to be associated with increased AMR in communities. Additionally, studies have shown that antimicrobial residues and multi-drug resistant (MDR) bacteria are common in surface waters around the world. Proper WASH infrastructure can help reduce the burden of infectious disease in communities, including the burden of antimicrobial-resistance bacteria. Prior studies have shown that low SES negatively impacts AMR colonization, with wealthier communities demonstrating less AMR organisms. Unfortunately, most studies to date have studied these questions using ecological analyses, not at the individual or household level. Research on the relationship of AMR and environmental factors and socioeconomic factors represents an important gap in the literature that I aim to characterize.

Through this project, I will be examining the colonization of children with extended-spectrum β lactamase (ESBL)-producing *E. coli* and MDR *E. coli* living within five peri-urban parishes east of Quito, Ecuador.