The Planetary Child Health and Enterics Observatory (Plan-EO): an Interdisciplinary Research Initiative and Web-Based Dashboard for Mapping Enteric Infectious Diseases and their Risk Factors and Interventions in Low- and Middle-Income Countries

## Josh Colston

Diarrheal disease remains a leading global cause of childhood illness and death and is caused by various species of climatesensitive pathogens. The emerging Planetary Health movement emphasizes the interdependence of human health with natural systems, with much of its focus on infectious diseases and their interactions with environmental and human processes. Meanwhile, the era of big data has transformed the curation, aggregation and dissemination of health information engendering a public appetite for open access, web-based repositories of infectious disease data. However, enteric infectious diseases (EID) have largely been overlooked by these developments. The Planetary Child Health and Enterics Observatory (Plan-EO) is a new initiative based at UVA that builds on existing partnerships between epidemiologists. climatologists, bioinformaticians, and hydrologists as well as investigators in numerous low- and middle-income countries (LMICs). Its objective is to provide the research and stakeholder community with an evidence base for the geographical targeting of EID-specific child health interventions. The initiative will produce, curate, and disseminate spatial data products relating to the distribution of enteric pathogens and their environmental and sociodemographic determinants, making them available to decisionmakers via an online dashboard. To date Plan-EO has compiled microdata from 27 studies with ~85,000 diagnostic results from 40,000 children aged 0 - 59 months at sites in 25 LMICs and georeferenced to over 14,000 unique locations and outreach to additional studies is ongoing. An initial published analysis of Shigella has yielded detailed prediction maps and insights into the mechanisms underlying transmission. These approaches will be extended to other pathogens and their findings used to assess their relative sensitivity to changes in climate compared to other determinants such as sanitation improvements. Plan-EO will eventually develop a scenario-based framework to support decision-making, resource allocation and identification of priority populations for targeting EID-specific interventions such as novel vaccines.

## **GPCE Seminar Series**

Thursday, 09/14 11:30am ET Join by Zoom

Josh Colston is an epidemiologist and spatial demographer with research interests that include infectious diseases, childhood undernutrition and their socio-economic and environmental determinants in low-resource settings. He coordinates the Planetary Child Health and Enterics Observatory (Plan-EO) Initiative, and provides analytical expertise to various NASA-, NIH-, CDC-, WHO-, EU- and Gates Foundation-funded research projects at the UVA School of Medicine. This research involves characterizing environmental drivers of enteric diseases, emerging febrile illnesses, and COVID-19 using earth observation (satellite), household survey, and surveillance data. He also teaches the undergraduate Introduction to Epidemiology course in the Department of Public Health Sciences. A US-born Brit, he has a masters' degree from the London School of Hygiene and Tropical Medicine and a PhD from the Johns Hopkins Bloomberg School of Public Health.



