

January 2023 Thematic Committee Briefing

Theme #1: Modeling Pandemic Potential for Disease Surveillance

The PIPP Phase I PILOT (Predictive Intelligence for Limiting Outbreak Threats) project comprises three themes, and each theme is spearheaded by a thematic committee. The aim of Theme 1, *Modeling Pandemic Potential for Disease Surveillance*, is to identify scientific gaps and best practices in assessing the pandemic potential of a specific pathogen in a given context. In order to lay the groundwork for this aim, we brought together an interdisciplinary group of scholars and health practitioners in our first virtual workshop on November 4, 2022. Approximately 20 participants from around the world and across a variety of disciplines discussed methods and metrics best suited to address pressing questions in outbreak science. The primary focuses of the workshop were on the use of novel data sources for disease surveillance and estimating the basic and effective reproduction numbers—two parameters that are useful in providing information on the transmissibility of pathogens in certain contexts—early on in the course of a disease outbreak. Workshop participants reflected on lessons learned from the COVID-19 pandemic as well as existing scientific gaps and policy implications in order to better inform future epidemic and pandemic response efforts. Following the workshop, a white paper and policy brief documenting this discussion were completed and will be publicly available in early 2023.

Following the workshop, Theme 1 recruited members to its thematic committee to help guide preparation on scientific questions and subsequent manuscripts relevant to our aims. In addition to Maimuna Majumder, PhD, MPH (PI) and Angel Desai, MD, MPH (co-PI), Theme 1 has also thus far recruited Sangeeta Bhatia, PhD (Imperial College London); Emily Ricotta, PhD, MSc, (NIAID); and Thomas McAndrew, PhD (Lehigh University) to serve on the committee. Our next committee meeting will be planned tentatively for early 2023.

Finally, our thematic committee has been working on several research projects to better characterize important parameters in the early days of an infectious disease emergency that can potentially inform risk assessments and response efforts. Led by our trainees Kathryn Schaber, PhD (Postdoctoral Fellow, Harvard Medical School) and Sonja Marie Neumeister, MPH (Research Assistant, University of California Davis), we are currently conducting a meta-analysis regarding modeling methods for reproduction number estimation, as well as modeling the most recent Ebola outbreak in Uganda. Notably, we have recently recruited a junior scholar with unique expertise at the intersection of machine learning, medicine, and the Ugandan context—Baker Lubwama (MD Candidate, Cambridge University)—to participate in our ongoing work on the Ebola outbreak. He will be joining Drs. Majumder and Schaber at the Majumder Lab in Boston this summer as a visiting scholar, during which 50% of his effort will be dedicated to the PILOT project.