**October 2023 Thematic Committee Briefing**

**Theme #2: Modeling the Impact of Intervention Policies for Disease Prediction**

Building on the goals of Theme 2 in the PIPP Phase I PILOT (Predictive Intelligence for Limiting Outbreak Threats) project, our focus remains on identifying models and tools that can enhance the prediction and prioritization of intervention policies for disease prevention at both individual and community levels.

Zhicheng Zhang (Research Assistant, CMU) presented our research paper, *Unlocking the Potential of Public Datasets: Wastewater-Based Epidemiological Forecasting During COVID-19*, at the epiDAMIK workshop at the 29th ACM SIGKDD Conference on Knowledge Discovery and Data Mining in August 2023. Meanwhile, Paula Rodriguez-Diaz (PhD Candidate, Harvard University) presented the talk *Fairness and Budget Flexibility: Advancements in Restless Multi-Armed Bandits for Real-World Planning* at INFORMS in Phoenix, Arizona, where she highlighted the work done by the PILOT team in the use of Restless Multi-Armed Bandits as an effective model to inform policies for resource allocation in various public health settings. These conferences provided us with excellent opportunities to receive feedback on our work from a broad audience.

Our team is also exploring the possibility of leveraging decision trees to design more interpretable intervention policies. More specifically, given the limitations of previous efforts that generate large and complex decision trees, we aim to investigate the use of a constrained decision tree policy space. One avenue we are currently pursuing involves discretizing the value of each split value and limiting the possible outcomes to a small set. We believe that with this new approach, we can learn interpretable decision-tree-based intervention policies that are more intuitive and explainable to both policy-makers and the public.

As we delve into this new research area ahead of our PIPP Phase II proposal, we maintain our commitment to learning from past experiences and exploring innovative strategies that will enhance our ability to predict and prevent infectious disease crises, with the ultimate goal of better informing strategies to prevent disease transmission through intervention planning.

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