Hypertension (HTN), which affects nearly 80 million U.S. adults and costs society approximately $80 billion annually, is the leading modifiable cause of cardiovascular disease (CVD). Current guidelines recommend a standard systolic blood pressure (SBP) treatment goal of <140 mmHg in most patients. The Systolic Blood Pressure Intervention Trial (SPRINT) showed a 25% reduction in CVD events with intensive SBP treatment (<120 mmHg) in high CVD risk adults. However, intensive SBP treatment likely requires additional health care resources and practice changes so it will be challenging to implement in real-world settings.

This project proposes to: (1) build and validate a “hybrid” hypertension treatment simulation model to determine the cost-effectiveness of intensive SBP treatment in a population-based sample of SPRINT-eligible U.S. adults, (2) incorporate local data from diverse health systems into the hybrid blood pressure model to compare the cost-effectiveness of intensive SBP treatment implementation strategies, (3) engage local stakeholders in study design and communication strategies, and (4) disseminate results to local and national stakeholders to optimize intensive SBP treatment implementation. The central hypothesis is that intensive SBP treatment implementation in health systems will be feasible and cost-effective in high CVD risk patients compared to standard treatment even when considering local implementation factors.

Most past research using computer simulation methods generates “average” national population estimates and the models are often considered opaque “black boxes” by decision makers. This project is innovative as it applies simulation methods to the local health system level, using local patient data, and engages local stakeholders to address practical implementation barriers and facilitators. For intensive SBP treatment, this may result in more efficient and safer implementation, while also reducing the burden of CVD attributed to raised SBP.