

## **ABSTRACT**

Rapid and accurate diagnoses are important because they drive evidence-based care in health systems. Point-of-care technologies (POCT) can aid in diagnosis by bringing advanced technologies out of hospital or clinical settings and closer to the patients. Health networks are constrained by natural connectivity in the interactions between geography of resources and social forces. Using a geographic information system (GIS) we can understand how populations utilize their health networks, visualize their inefficiencies, and model alternatives. This project focuses on cardiac care resource in rural Isaan, Thailand. A health access model was created using ArcGIS Network Analyst 10.1 from data representing aggregated population, roads, health resource facilities, and diagnostic technologies. This model was used to quantify current cardiac health access and improve upon that access using both widespread and resource limited strategies. Sensitivity analysis revealed that altering travel speeds of roads has a large effect on the calculation of health access. Results indicated that having diagnostic technologies closer to population allowed the streamlining of care paths. The model allowed for comparison of the effectiveness of the implementation strategies. This model was created to help put the benefit of adopting POCT within health networks within perspective. Additionally it can help evaluate these alternatives diagnostic placement strategies as compared to the current health access and evaluate the relative costs and benefits.