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PROJECT TITLE: Linking Social Determinants to Healthcare Delivery for At-Risk Pediatric Populations

PROPOSAL NUMBER: 05-06191.UW	PIs: Heim & Mastrangelo	
RESEARCH THEME: Population Health		
BUDGET: $50,000	UNIVERSITY: UW	PROJECT YEAR: 1

PROJECT DESCRIPTION:

Many factors contribute to health & health outcomes of patients including social & environmental determinants, such as economic stability, housing & physical environment, food access, community support, & available healthcare systems. The degree of change as well as the emergent set of changes that might occur in concert can often have health consequences for at-risk populations. In this proposed study, we intend to investigate and quantify opportunities for improving pediatric population health, patient experience and costs -- the Triple Aim -- by aligning social determinant events with timely (rapid) healthcare delivery.

HOW THIS IS DIFFERENT THAN RELATED RESEARCH:

This proposed research focuses on at-risk, asthmatic pediatric populations & examines the potential to improve the time-until-response for care & the reduction in total cost of care. Using simulation modeling, the research intends to demonstrate the value of responding to individual social determinant events as well as multiple events occurring within a defined time span. The research has the potential to impact other chronic respiratory diseases affected by environmental factors. This is phase one of a two-part research program. The second phase will demonstrate the practical application of social determinant response by developing the necessary databases, triggers, & event sources.

EXPERIMENTAL PLAN:

Our initial focus will concern care management & response for pediatric patients with signs & symptoms of asthma. We are interested in identifying the relationship among social determinants & dynamic changes to those factors that influence the state of the child's health. For example, asthma exacerbation can be brought on by environmental exposures and stress. It can also be a result of changes in housing, such as movement into crowded homeless shelters, where they may be exposed to increased levels of smoke & other irritants. We will use a mixed-methods approach to combine qualitative guidance for diagnosis & treatment of respiratory diseases with quantitative data from literature.

EXPECTED MILESTONES:

During the first two quarters, the data distinguished the relationshiop between social determinants, patient conditions, & asthma triggers were identified, & the healthcare system responses (medication & patient reaction) were characterized. The datasets were used to construct and very the logic process flows for prototype discrete event simulation (DES) models. Experiments, using the parameterized simulation models, will take place during the second year of the project to validate the predicted results with our IAB partner (SCH).

BENEFITS TO INDUSTRY:

Industry partners will be able to investigate anticipated changes in levels of demand when considering at-risk pediatric populations and trigger events. They will use simulation models to examine the complex interdependent consequences of new patient monitoring capabilities.

EXPECTED DELIVERABLES:

DES models that capture the dynamic relationships among at-risk pediatric populations, social determinant events, healthcare response, and subsequent disease path evolution.