Preventive care services can detect early stages of disease and prevent existing conditions from worsening. They are widely recognized as key to ensuring people stay healthy longer and potentially lowering health care costs. Though lack of health insurance is often cited as a reason people forgo preventive care services, many of those who do have insurance are also failing to receive preventive care. Understanding why is important to making disease prevention strategies work.

I propose to further that understanding by developing statistical and dynamic network analysis models based on administrative insurance claims data. This work will present a new application of temporal trail analysis methods, a relatively new area in dynamic network analysis. Conceiving of patients’ medical utilization patterns as trails taken through the health care network provides a new way of understanding how patients receive health care services in the United States. This interdisciplinary computational approach will allow for the detection of more complex patterns of behavior among compliant and non-compliant patients.

I will first investigate whether there are patterns of time-invariant characteristics (including socio-demographic characteristics, disease characteristics and network position) sufficient to predict who will and will not comply with preventive care guidelines. Then, using a temporal network model, I will attempt to determine whether insured individuals who comply with preventive care guidelines follow significantly different trails through the health care services network than those who do not receive such care. The results of my work will be used by a regional health insurance carrier to develop targeted real-world interventions to encourage more people to get recommended preventive care services.

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