



Virtual Colloquium

# Understanding Spatiotemporal Patterns in COVID-19 to Guide Local Public Health Action

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Friday, February 26<sup>th</sup>, 2-3pm Eastern Time (US and Canada)

**Abstract:** The risk and impact of the coronavirus disease 2019 (COVID-19) pandemic is uneven across space and time. Because severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is spread via close contact, it is essential that we understand what is happening in smaller, local areas to develop policies and practices that minimize structural vulnerabilities and build resilient communities. This talk will focus on the spatiotemporal epidemiology of SARS-CoV-2 infection and related outcomes of hospitalization and death due to COVID-19 in Rhode Island. In collaboration with the Rhode Island Department of Health, a team of researchers at Brown University has led Project SIGNAL, an initiative using advanced spatial analytical techniques to understand where the burden of SARS-CoV-2 and COVID-19 is most disproportionate and what actions can be taken to prevent and mitigate community transmission. This talk will provide an overview of several methods for detecting and characterizing disease hotspots, including kernel density estimation, Getis-Ord  $G_i^*$  statistics, and spatial scan statistics. This talk will also describe applications of machine learning methods to assess how neighborhood characteristics reveal sources of community-level vulnerability and resiliency and how day-to-day changes in mobility can be used to predict shifting patterns of SARS-CoV-2 diagnosis and related outcomes over space and time. All results will be discussed with respect to their implications for public health policies and programs to respond to the COVID-19 pandemic in Rhode Island and across the United States.

**Bio:** Dr. William Goedel is an assistant professor (research) at the Brown University School of Public Health's Department of Epidemiology. He is a social and spatial epidemiologist, with methodological expertise in the use of geographic information systems (GIS) and spatial statistical approaches to measure the effects of neighborhood environments on health outcomes. Beyond his work conducted in response to the COVID-19 pandemic, his research focuses on improving the implementation and impact of evidence-based strategies for the prevention of HIV infection and drug-related harms in the United States. He earned his doctoral degree in epidemiology from the Brown University School of Public Health in May 2020.

