



The O'Brien Institute for Public Health & the  
Department of Community Health Sciences present:

**Mathematical Modelling of Infectious Disease Epidemics using the Gridded Population of the World (GPW)**

**Speaker: Dr. Ashok Krishnamurthy**

Friday, May 8, 2020 - 12:00 to 12:50 p.m.

Zoom Webinar: <https://ucalgary.zoom.us/j/431581000>

Mathematical modelling of infectious diseases is an interdisciplinary area of increasing interest. In this seminar Dr. Ashok Krishnamurthy will present spatial variants of the SEIR models based on our real-world experience of tracking the spread of:

- measles in pre-vaccine England and Wales (1944-1966),
- Ebola in the Democratic Republic of Congo (2018-2020) and
- a realistic scenario involving tracking the COVID-19 pandemic (ongoing).

Our analyses may shed light more broadly on how the disease spreads in a large geographical area with places where no empirical data is recorded or observed. These include reading in and formatting gridded population of the world (GPW) at various spatial resolutions and linking real-time disease incidence/death data (from WHO situation reports, publicly available data or ArcGIS dashboards), producing spatio-temporal disease maps, and visualising the results using the free, open-source software R.

Dr. Ashok Krishnamurthy is an Associate Professor in the Department of Mathematics and Computing at Mount Royal University (MRU), Calgary. Dr. Krishnamurthy has a PhD in Biostatistics from the University of Louisville, Kentucky, USA. His post-doctoral research in the Department of Mathematical and Statistical Sciences at the University of Colorado Denver was focused on spatial epidemiology, a subfield of health geography, to develop novel methods for tracking infectious disease epidemics using mathematical models.

His current work examines the application of spatial variants of SEIR models to track the spread of COVID-19. His work is funded by the Office of Research Services and Community Engagement (ORSCE) at MRU.

**Objectives:**

1. To understand the types of mathematical models related to infectious disease outbreaks (e.g. Measles, Ebola, COVID-19 etc.)
2. To learn about innovative techniques for generating spatiotemporal disease maps using open-source tools such as Gridded Population of the World (GPW).
3. To understand the role of Geographical Information Systems (GIS) in the spatial mapping of disease hotspots.

**This event is a self-approved group learning activity (Section 1) as defined by the Maintenance of Certification Program of the Royal College of Physicians and Surgeons of Canada.**

The recording will be archived and accessible for later viewing at: <https://obrieniph.ucalgary.ca/news-and-events/chsobrien-institute-seminar-series>