Spatial Epidemiology short course

20-21st November 2023

UQ St Lucia campus. **39-208 - Colin Clark Building, Computer Lab**

Target audience: HDR students and postdocs (UQ)

Number of participants: A total of 20 participants

Format: In-person lecture and hands-on practical sessions. The course will not be offered for remote attendance. Attendees will be required to bring their own laptops for practical sessions. This is a free event.

Facilitators: Prof Cassiano Victória, Dr Tatiana Proboste Ibertti, Dr Kei Owada, As/Prof Benn Sartorius and Dr Behzad Kiani

Draft course outline: This short course will cover various topics of spatial epidemiology using R software, including modelling, mapping, cluster analysis, ecological suitability model mapping, and Geographically Weighted Regression.

Schedule:

20th November	
Welcome and Introduction to the Course	**09:00 am – 09:15 am**
Session 1	**09:15 am – 10:00 am**
Prof. Cassiano Victoria	• Introduction to spatial epidemiology and geoprocessing basic concepts. • Types of spatial health (areal, point, temporal, presence-only, presence-absence, abundance, incidence) and covariate data. • Review of autocorrelation, confounding and detection error.
Break/Q&A	**10:00 am – 10:30 am**
Session 2	**10:30 am – 12:30 am**
Dr Tatiana Proboste Ibertti	Spatial Data Visualisation **Theory (40 minutes)** a. Accessing open data b. Transformations, CRS, extraction, calculation c. Spatial data wrangling **Practical (80 minutes)** Visualisation: building your own map
Lunch Break	**12:30 pm – 01:30 pm**
Session 3	**01:30 pm – 03:30 pm**
Dr. Kei Owada	Data exploration: analysing disease clustering

	Theory (60 minutes) a. Clustering for point data b. Clustering for areal data (global and local) c. Clustering for spatiotemporal data **Practical (60 minutes)** Practical session on disease clustering
Day 1 wrap up/Q&A	**03:30 pm – 04:00 pm**
21st November	
Recap of the previous day	**09:00 am – 09:30 am**
Session 4	**09:30 am – 12:00 pm**
A/Prof. Benn Sartorius	Point data case study: geostatistical modelling **Theory (45 minutes)** • Exploratory analysis for covariate selection • Geostatistical model formulation and parameter estimation • Spatial prediction • Model validation • Assessment of the contribution of covariates to spatial prediction **Practical (75 minutes)**
Lunch break	**12:00 am – 01:00 pm**
Session 5	**01:00 pm – 02:30 pm**
Dr Behzad Kiani	Geographically Weighted Regression (GWR) **Theory (40 minutes)** - Global and Local Regression Models - GWR Modelling in Details - Interpreting the result of GWR modelling - An introduction to different software for GWR (ArcMap, QGIS, MGWR and R) **Practical (50 minutes)** e. An introduction of R packages to do GWR modelling and generate the results f. Do a real case study on GWR modelling in an urban area in Canadian context
Break	**02:30 pm – 03:00 pm**
Session 6	**03:00 pm – 04:00 pm**
	Projects troubleshooting discussion
Course wrap up/Q&A	