

## **Agent-Based Simulations in Spatial Epidemiology**

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**Abstract:** The COVID-19 pandemic has taught us, that the spread of infectious diseases and associated mitigation strategies are strongly influenced by regional geographic and demographic patterns as well as local economic and ecological conditions. Agent-based models (ABMs) are a particularly prominent tool in the area of spatial epidemiology as they can depict high-resolution populations and individual behavior as well as the interaction of individuals and their environment.

In this talk, we delve into a cross-sectional variety of epidemiological models and simulations ranging from global air-travel models predicting the introduction of infectious individuals across international borders down to local simulations of rodent populations who are potential hosts of the Hantavirus and associated implications for intervention planning. We will discuss how such models can inform public health decision making on varying geographic scales (global, national, regional, local) and how different transmission routes (e.g. air-borne or vector-borne) are considered in these simulations. The presentation will specifically highlight the application of ABMs to study the spread within heterogeneous populations and across geographic landscapes. It will offer a conclusion on the importance of spatial ABMs for disease prevention and mitigation, and highlight a selection of ongoing research efforts in this discipline.