Contribution ID: **102** Type: **Paper**

The dynamic interactions between urban communities during the pandemic

Tuesday, July 16, 2024 4:20 PM (20 minutes)

The travel restriction measures to reduce contacts during a pandemic, such as Covid-19, had inevitably altered the dynamics of a city as they were often applied in different strengths and at different stages of the pandemic, and led to structural changes of urban spatial interactions underlying disease spreading. A deeper comprehension of the dynamics of the spatial interaction structures is therefore crucial for a sound strategy in disease control, especially if it is based on a data-driven approach that examines the spatiotemporal patterns of real mobility data. This study uses the public transport ridership data of Singapore to reveal the dynamics of local and long-range urban mobility structures over four periods of a pandemic (pre-pandemic, lockdown, transition, and new norm). Leveraging on network community detection algorithms, the study identified latent movement boundaries from actual flows. Additionally, it revealed intra- and inter-community flow structure that potentially accounted for local and long-range diffusions. The intra-community flow intensity results showed no obvious differences in the mobility patterns among the four periods, suggesting consistent local expansion diffusion patterns throughout the pandemic. The inter-community analysis result revealed the relationships between different parts of the city and thereby the chance of virus spread. Understanding the complex intra- and inter-community network structures provides a more holistic picture of the disease diffusion process that can be used for disease management strategies simulation and future mobility-related urban planning post-pandemic.

Primary authors: FENG, Chen-Chieh (Department of Geography, National University of Singapore); Dr CHIN, Benny Wei Chien (Department of Geography, National University of Singapore); Dr WANG, Yi-Chen (Department of Geography, National University of Singapore)

Presenter: FENG, Chen-Chieh (Department of Geography, National University of Singapore)

Session Classification: Paper Presentations

Track Classification: Innovation in Methods: Geospatial Analysis