

# **Tracking spreading events through human mobility data and networks**

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It is a crucial task for the public health to predict the spread of infectious diseases in cities from epidemiological data. It is expected that the human mobility plays an important role in this goal, as the infection takes place through the contact between residents. Due to the development of mobile devices such as smartphones, it became easier to acquire large-scale and high resolution data of the human mobility.

As the human mobility pattern is heterogeneous even in the spatial scale of a city, network-based analysis is essential. There are various possibilities of the construction of the networks: Mobility records of residents can be aggregated in the unit of sub-regions of the city, or agent-based construction is possible may be applicable to estimate individual-based risks of infection.

In this study, we explore the possibility of improving the predictability of the spread of infectious diseases with aid of the human mobility data and the network analysis. The contact networks are derived from the real mobility data, and the correlation with the spreading patterns of infectious diseases is analyzed. Relationship between network topology and spatial patterns of the spreading is theoretically discussed.