

## **Monitoring the spatio-temporal spread of infectious diseases**

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We discuss the application of GIS methods during an acute infectious disease outbreak. As the outbreak evolves, real-time monitoring of spatio-temporal case data can provide important information about the transmission dynamics of the infectious agent. Monitoring the spread of the epidemic can facilitate the design, implementation and evaluation of potential interventions.

During the severe acute respiratory syndrome (SARS) epidemic of 2003, the relatively low transmissibility of the SARS coronavirus resulted in a high degree of spatial clustering of cases in Hong Kong (Lai et al., 2004). We further investigate the spatial clustering in Hong Kong, and investigate the performance of various disease clustering tests on prototypical days through the course of the epidemic. We explore the prospective detection of clusters using methods such as the space-time scan statistic (Kulldorff, 2001). Finally, we consider the performance of these procedures in future epidemics.

### **References:**

Lai PC, Wong CM, Hedley AJ, Lo SV, Kong J and Leung GM. Understanding the spatial clustering of severe acute respiratory syndrome (SARS) in Hong Kong. *Environmental Health Perspectives* 2004; **112** (15): 1550-6.

Kulldorff M. Prospective time-periodic geographical disease surveillance using a scan statistic. *Journal of the Royal Statistical Society Series A* 2001; **164** (1): 61-72.