

## **Spatial Analysis of Food and Waterborne Diseases in Sabah, Malaysia**

### **ABSTRACT**

Food and waterborne disease (FWBD) epidemic can produce devastating public health outcomes. From 1990 to 2006, the annual notifications for FWBDs in Malaysia ranged from 2,000 to about 10,000 cases. The purpose of this study was to describe the spatial epidemiology of FWBDs in four districts of Sabah from the year 2011 to 2014. This study was a retrospective review of four years (i.e. 2011 to 2014) worth of data from Kota Kinabalu, Penampang, Putatan, and Papar districts. All reported cases of cholera, dysentery, food poisoning, typhoid, and viral hepatitis A from these areas and district health offices were included. Coordinates for the locations of the cases were based on home addresses. Among a total of 1997 cases of FWBDs, food poisoning was the highest reported disease with 1787 (89.4%) cases. Kota Kinabalu had the most reported cases of FWBDs with 1368 (68.5%). In the year 2012, FWBD incidence was the highest at 16.44 per 10,000 populations. Kernel density estimation demonstrated hot spots of food poisoning and cholera in the western areas near the coast, while typhoid and viral hepatitis A cases had minimal hot spots and appeared to be dispersed. Average nearest neighbour analysis showed clusters of food poisoning and cholera cases. Further analysis with the nearest neighbour hierarchical spatial clustering presented 32 clusters of food poisoning and 7 clusters of cholera. Food poisoning and cholera usually occur in clusters. From these findings, it can be concluded that these areas, food poisoning, and cholera have significant spatial clustering and patterns. Meanwhile, other FWBDs did not occur in clusters for this study. This indicates the possibility of under-reporting or real dispersion of cases brought about by an efficient mechanism of spread from a common source.