Spatial Clustering of Cholera in Sabah, Malaysia

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ABSTRACT

Introduction: Cholera epidemics can produce devastating public health outcomes. Cholera distribution is influenced by temperature, precipitation, elevation, distance to the coastline and oceanic environmental factors such as sea surface temperature, sea surface height and ocean chlorophyll concentration. The purpose of this study is to describe the spatial epidemiology of cholera in the four districts of Sabah. **Methods:** This is a retrospective review of 4 years (2011 to 2014) data from the districts of Kota Kinabalu, Penampang, Putatan and Papar, Sabah. All reported cases of cholera from those areas are included. Coordinates for locations of the cases are based on home addresses. SPSS v20, ArcGIS v10 and CrimeStat IV were used for data analysis and mapping. **Results:** Cholera showed several clustering of cases, such as in 2011 and 2014 in Kota Kinabalu. In the year 2011 and 2013, Penampang and Papar districts had the nearest neighbour index of less than 1, but p value was not significant, meaning the pattern did not appear to be significant. Nearest neighbour hierarchical clustering analysis further revealed cholera had 7 clusters, of those 6 were first order and 1 was a second order cluster. **Conclusion:** Cholera shows disease clustering which could mean it is due to its common point source or localised human to human transmission. Using GIS as a tool may help in surveillance and control of cholera infections.

Keywords: Cholera, Diarrhoea, Cluster, Spatial analysis, GIS