The association between climatic factors and dengue fever: a study in Subang Jaya and Sepang, Selangor

ABSTRACT

Dengue fever is one of the most dangerous vector-borne diseases. According to the World Health Organization (WHO), dengue fever is a mosquito-borne infection caused by virus serotype DEN-1, DEN-2, DEN-3 and DEN-4. In Malaysia, dengue fever cases are on the rise from 6,000 cases in 1995 to over 40,000 in 2010, and this number is still rising. In 2014, the increase of dengue fever cases was alarming. It was reported that up to the end of the year 2014, there were 108,698 notified cases, indicating an increment of 151% compared to the same period of time in 2013 with only 43,346 reported cases. Selangor was the highest contributor of dengue fever cases in 2014. The objective of this paper is to study the relationship between climatic factors namely temperature, rainfall and humidity to the prevalence of dengue fever in Subang Jaya and Sepang district, Selangor. Data on monthly average temperature, precipitation, relative humidity and dengue fever cases for each month in 2014 and 2013 were collected. Data collection was dealt with a few institutions such as Malaysian Meteorological Department, Subang Jaya and Sepang Municipal Council and health district offices. Data were analysed using SPSS (Statistical Package for the Social Sciences) Version 20. General linear model analysis was used to investigate the relationship between the climatic variables and dengue prevalence. Results and Discussion: Based on the general linear model, rainfall and humidity were found to have significant relationships to monthly dengue fever cases ($p = <0.001$, $p = 0.002$). Rainfall was identified as the most significant predictor because rainfall can provide more breeding places for Aedes mosquitoes. As for humidity, higher relative humidity had been associated with increased Aedes aegypti feeding activity, survival and egg development. Temperature was not significantly related to monthly dengue fever cases ($p = 0.561$) in this study. However, this could be due to the short period of study. Conclusion: Climatic factors play an important role in the prevalence of dengue fever. However, there are many other factors of dengue fever that should be considered such as urbanisation as well as community knowledge, attitude and practice.

Keyword: Temperature; Rainfall; Humidity; Dengue fever; Selangor