

ABSTRACT

THE EFFECT OF CLIMATE VARIABILITY ON THE SPREAD OF INFECTIOUS DISEASES: DENGUE HEMORRHAGIC FEVER IN SURABAYA, EAST JAVA, INDONESIA

Background: Dengue hemorrhagic fever (DHF) which is an arboviral infectious disease is a public health concern that has occurred frequently as an extraordinary event due to its fast spread and fatal potential in Indonesia. The incidence rate has increased ever since the first case recorded in 1968 with the expanding endemic regions and has affected most of the provinces in East Java. Climate variability plays an important role in the epidemiology of vector-borne diseases. As a tropical country, Indonesia with a monsoonal wet season and a dry season provide an optimum habitat to support the breeding of *Aedes aegypti* mosquitoes and spread of its virulent infection.

Purpose: This study aims to estimate the effects of climate variability on the spread of DHF in Surabaya, East Java, Indonesia.

Methods: An ecological descriptive study with a retrospective time-series analysis approach was used. *One-Sample Kolmogorov Smirnov Test* was used to evaluate the cumulative distribution function; while *Spearman* non-parametric correlation test was used to analyze the relationship between monthly climatic data (monthly average temperature, monthly rainfall, monthly humidity) and the incidence of DHF in Surabaya, East Java, Indonesia from 2009 to 2017.

Results: The correlation analysis showed that there was a statistically significant correlation between climate variability and DHF incidence in Surabaya, East Java, Indonesia from 2009 to 2017. Our findings showed that rainfall and humidity have positive correlations with DHF incidence, while average temperature has a negative correlation with DHF incidence.

Conclusion: The results indicated the impact of the climate variability on the DHF incidence in Surabaya, East Java, Indonesia from 2009 to 2017. More research is needed to better understand the relationship between climate variability and dengue transmission in Surabaya. Other factors such as regional climate phenomena and non-climatic factors should be considered in the assessment of climate related-effects on dengue transmission. Indonesian public health authorities should consider integrating climate variability into disease prevention strategies. Local and international partnerships should be promoted to improve targeted surveillance on dengue fever diseases, development of early warning systems (EWS) and future dengue prediction models.

Keywords: Dengue hemorrhagic fever, incidence, *Aedes aegypti*, climate variability, temperature, rainfall, humidity, Surabaya, East Java, Indonesia