UNIVERSITI TEKNOLOGI MARA

ASSESSMENT OF DENGUE CASES IN MALAYSIA USING SUSCEPTIBLE, INFECTED AND RECOVERED (SIR) MODEL

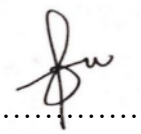
Wan Syakirah Binti Wan Shukri

Report submitted in fulfillment of the requirements for Bachelor of Science (Hons.) Management Mathematics Faculty of Computer and Mathematical Sciences

January 2021

STUDENT'S DECLARATION

I certify that this report and the research to which it refers are the product of my own work and that any ideas or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline.



……

WAN SYAKIRAH BINTI WAN SHUKRI

2019583901

JANUARY 27, 2021

ABSTRACT

Dengue is caused by the dengue virus, and no specific treatment is available. Since dengue cases are rising annually in Malaysia, the number of deaths is also increasing. This is due to a lack of awareness about dengue fever and a lack of cleanliness of the place. This research will therefore establish curve and graph to better foretell dengue accuracy to address this issue. Besides, it will encourage the government, in particular in the health sector, to focus on those states that are critical in the dengue zone. The medical treatment of experienced doctors and nurses would save lives and reduce the rate of mortality. A significant way to analyze the impact of human and vector populations on the spread of the disease would be through a mathematical model. This study developed a SIR (susceptible-infected-recovered) disease transmission modelling that includes the vector effect and used standard methods of dynamic modeling to evaluate the results. The states of equilibrium and their stability are analyzed. To evaluate dengue transmission dynamics in a single serotype model by using a vector-to-human compartmental model. Throughout this research study, ordinary differential equation (ODE) systems are used for deterministic model approaches. The approach here is to analyze the underlying dynamic systems, as well as to examine the anticipated effect of future interventions. We find from the study that the overall hospitalization time required to treat the disease is substantially reduced.

Keywords: Dengue, SIR Model, Aedes, Mosquito, Vector-host, Malaysia

TABLE OF CONTENTS