Universiti Teknologi MARA

Early Warning System To Predict Dengue Hot Spots Using Hierarchical Clustering Algorithm

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ABSTRACT

The most popular issues of illness that always been talked about is Dengue fever. Dengue fever (DF) is a moderate viral illness transmitted by *Aedes* mosquitoes. It symptoms can be characterized by fever, rash, and muscle and joint pains. There is no vaccine available for dengue for this time. In this project, the goal is to achieve an automatic dengue prediction. The function of this system is to make sure it will detect dengue outbreak patterns in term of location of the possibility dengue is almost occurred. The Ministry of Health (Malaysia) intends to predict the region that will have potential in getting dengue outbreak to get the precautions. The existing system that provided makes the officer in Ministry of Health (Malaysia) take a lot of time to decide which area is often occurring dengue every year because of the rate of dengue cases is kept increasing. This tool is specialized for the dengue outbreak pattern detection to predict the dengue outbreak future information that can assist the users to have a better understanding about the patterns of dengue that can lead to the attribution of the past dengue cases. The suitable technique in detecting and predicting the potential area that tend to occur dengue is by using Clustering algorithm (CA). This algorithm will help in detecting the region that has a high risk to occur dengue once again by grouping of an area based on their type or distance. The results shows, in every region of Seksyen 7 suffered from a lot of dengue fever that lead to increasing of the rate of dengue cases every year. Zone 5 is detected as the most frequent of dengue cases always occurred. Thus, it can assist the Ministry of Health (Malaysia) in preparing a necessary precaution action in every region of Seksyen 7 to prevent dengue outbreak by reviewing the pattern and also can reduced the infection of dengue fever.

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CHAPTER 1

INTRODUCTION

This chapter focuses on the general overview of project background and the foundation of the project that consist of problem statement, research questions, objectives, scope of the project, the significance of the research project of dengue prediction and lastly summary that conclude all of the subject topics in this chapter one.

1.1 Background of Study

Nowadays, there are several diseases that are out of control and one of the diseases is dengue fever (DF). Dengue is the types of disease that can cause severe joint and muscle pain (Buczak et al., 2014). The most awful thing that dengue can bring is death. In recent years, with the expanding of citizens in Malaysia and also the change in climate, makes the number of dengue patients increase unknowingly. From there, the number of deaths per year increases due to the dengue viruses carried by the *Aedes* mosquito.

Recently, there is no exclusive treatment to handle patients that having dengue virus (Aloka. Munasinghe, H.L. Premaratne, & Fernando, 2013). Thus, prevention is the best solution to reduce this disease and also very important to save many lives. Ministry of Health (Malaysia) plays an important role to stop and preventing this dengue issue from happening. They used so many ways to prevent dengue to make sure everyone can live in a healthy environment and have a good health without dengue virus.

There are another ways to prevent dengue outbreak and reducing rate of the dengue outbreak rate in an effective ways. It is by knowing the future information about the possibility area of dengue outbreak. One of the most