Research Title: Studying the effects of natural catastrophe such as flooding on the transmission of mosquito borne diseases such as dengue and malaria diseases in Thailand using mathematical modeling .

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ABSTRACT

After each flooding in Thailand, there are many areas appropriated for the growing of mosquitoes. *Aedes* Mosquitoes typically prefer to lay eggs in stagnant clean water and biting human for the daytime. After flooding, we found many dengue patients and may increase the spread of the disease. Dengue virus has four serotypes such as DEN-1 DEN-2 DEN-3 and DEN-4. Another disease that is a common disease that occurs with flooding is malaria. Malaria is an infectious disease that is caused by the protozoan Genus *Plasmodium* malaria parasite. Symptoms of malaria patients are depend on the type of infection, the incubation period, Immunity of each person, A condition of each patient receive anti-malaria drugs, etc. In this study, we formulate mathematical models that can be described the transmission of dengue disease and malaria with the flooding in Thailand. We also study the distribution of the disease by the spatial model with the movement of the population. Numerical simulations of our models are found to show the distribution of this disease. The set of parameters are found to reduce the outbreak of this disease. The collected data are used for analyzing the characteristics of this disease.

Keywords : Transmission, standard dynamical modeling theorem, flood, spatial model, mathematical model, catastrophe, dengue disease, malaria disease