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DENGUE CONTROL ANALYSIS IN MULTI-PATCHY ENVIRONMENT

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Dengue is one of the major international public health concerns for many years [1]. Although medical treatment to cure people from dengue is not yet be discovered, many interventions to controlling the spread of dengue have been proposed such as with vector control program [2, 3], vaccination [4, 5], using dengue repellent [6, 7], etc. Aside from the best form of intervention is still debatable, human mobility have made the complexity of dengue control program become more complex to be understood. Therefore, a mathematical model for the transmission of dengue will be introduced in this talk. We consider a spatially discrete system for population dynamics within a multi-patchy environment. Each patch consist of five mutually exclusive compartments representing human and vector dynamics. It also includes a control parameters (dengue repellent and insecticide) in order to fight dengue spreads. In the framework of our model, dispersion of population among patches is introduced by parameters m_{ij} which interpreted as migration rate from patch- i to patch- j . With analytical results of our model, we give some arguments about the contribution of human mobility on the dengue persistence and the level of success of dengue control program. Some numerical simulation will be given to give a visual interpretation of our analytical results.

References

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