

Dengue facts that modelers should know (but may not know)

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ABSTRACT

Dengue is the most common mosquito-borne infection causing public health problems in tropical regions. Recently, there were un-imported dengue cases in temperate climate region such as South of France, New York City in US. This means that dengue transmission has established in these regions.

Effort has been made to prevent dengue outbreak in these regions and further spreading of dengue to uninfected areas. Learning from the past history of areas where dengue transmission has become endemic is an important step to understand key factors in establishment of persistent dengue transmission. This data will help us predict and prevent further dengue transmission in recently infected area.

Dengue is a complex disease. There are 4 distinct serotypes with the 5th one reporting. Cross reactivity of immunity between the 4 serotypes makes interpretation of serological results difficult. In addition, key immunological factors were not known and the presence of dengue antibody may enhance disease severity. Clinical presentations of dengue varied with debatable clinical criteria of severe dengue. Outcome of dengue could be range from totally asymptomatic, mild undifferentiated fever to dengue fever, dengue hemorrhagic fever and dengue shock syndrome. The ratio between asymptomatic and symptomatic dengue infection also varied according to year of study, region, dengue viral serotype and genotype etc. Transmission capacity between asymptomatic and symptomatic infection could be different as well as vector competence and capacity of different mosquito species and strains. All these factors need to be considered when modeling dengue transmission dynamic.