DATA-DRIVEN STRATEGIES TO MODEL AND MITIGATE THE THREAT OF ZIKA

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ABSTRACT

The recent outbreak of Zika in Brazil and other Latin American countries has posed several challenges in the domain of public health. Although the outbreak is currently under control, because of the lack of vaccines and drugs till now Zika remains a threat. To effectively formulate strategies for preventing a future outbreak, it is imperative to collate and mine relevant data from different sources. In this direction, several data-driven approaches have been explored. This includes modelling the spread of the disease from past outbreaks, identifying vulnerable geographical areas based on the distribution of mosquito vectors, exploring the virus genome for better understanding of the disease mechanism, screening of chemical compounds as potential targets for drug and vaccine development, and predicting new animal reservoirs of the virus for proactive intervention in the virus life cycle. This chapter explores such strategies in detail: highlighting the major themes of contemporary research, providing technical discussions and outlining potential directions of future work.

Keywords: Zika; Infectious diseases; SIR (Susceptible-Infectious-Recovered) model; Zika drugs; machine learning; statistical model; Quantitative Structure Activity Relationship (QSAR); disease surveillance

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