

NUMERICAL ASPECTS IN MATHEMATICAL MODELLING OF VECTOR-BORNE DISEASES

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The periodic outbreaks of vector-borne diseases still constitute one of the most serious global health and economic problems. According to the World Health Organization (WHO), every year there are more than 700 000 deaths from diseases such as malaria, dengue, yellow fever, Chagas disease, chikungunya, Zika, worldwide. Distribution of vector-borne diseases depends on demographic, environmental and social factors. Human mobility, urbanization and climate changes increase the probability of getting an infection and cause diseases also in places where they were previously unknown. For example, from September 2012 to March 2013, the autonomous region of Madeira in Portugal, reported the first dengue outbreak with more than 2000 cases. Mathematical modelling is a very important tool for studying epidemic spreading and the prediction of possible scenarios. We consider stochastic models described by master equation [2] and stochastic differential equations [1]. We discussed analytical and numerical aspects of this subject.

References

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