

A Universal Model of Epidemic: Optimizing Interventions

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Abstract The outbreaks of infectious diseases caused by natural factors or bioterrorism acts are, unfortunately, quite real threats for the overall population. Planning of an efficient response to an outbreak of an infectious disease requires coordinated efforts of various services aimed to most efficiently utilize the limited resources. This paper describes a model that optimizes utilization of resources when preparing to counter the bioterrorism threats or responding to epidemics caused by epidemiologically dangerous or socially significant pathogens. The model computes the volume of limited resources as well as the particular control activities (isolation, ring vaccination, or mass vaccination) necessary to minimize the optimization criterion, comprising the total number of infected persons, number of lethal cases, and several other characteristics. The model is available remotely via WEB-interface at <http://vector-epimod.ru>.