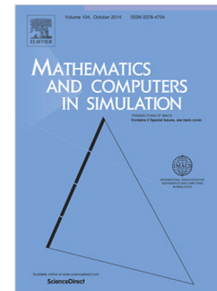


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The threshold of a stochastic SIS epidemic model with imperfect vaccination

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Abstract

In this paper, we analyze the threshold R_v^S of a stochastic SIS epidemic model with partially protective vaccination of efficacy $e \in [0, 1]$. Firstly, we show that there exists a unique global positive solution of the stochastic system. Then $R_v^S > 1$ is verified to be sufficient for persistence in the mean of the system. Furthermore, three conditions for the disease to die out are given, which improve the previously-known results on extinction of the disease. We also obtain that large noise will exponentially suppress the disease from persisting regardless of the value of the basic reproduction number R_v^S .

Keywords:

Stochastic SIS epidemic model; Imperfect vaccination; Threshold;

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