Stationary distribution and extinction in a stochastic SIQR epidemic model with media coverage under Markovian switching

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Abstract

This paper is concerned with stationary distribution and extinction of a stochastic SIQR epidemic model with media coverage which is disturbed by both white and telegraph noises. By using the stochastic Lyapunov function method, we obtain sufficient conditions for the existence of a stationary distribution of the global positive solution to the model. Then we establish sufficient conditions for extinction of the disease. A stationary distribution means that all the individuals can be coexistent and persistent in the long term. Finally, numerical simulations are introduced to illustrate our theoretical results.

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