

Qualitative Analysis of Stochastically Perturbed HIV Model

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Abstract

The dynamical behavior of a perturbed Human Immunodeficiency Virus (HIV) model is investigated in this paper. We first determine a positively invariant set in which the perturbed system admits a unique, positive, global solution. Following that, we discuss the stability of infection-free equilibrium of the deterministic model. We also obtain the conditions required for the p th -moment exponential stability, for the perturbed system. Later we show that if $R_0 > 1$ for smaller intensity of noise, the solution of stochastic system oscillates around E^* . Our results demonstrate that a large value of noise suppresses the disease from persistence exponentially. We also derive the condition for the persistence of the disease. Finally, comparison of our analytical results with simulations is to be done.

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