

On the global stability of cholera models

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Abstract

We conduct global stability analysis for the endemic equilibria of several deterministic cholera models. These models, incorporating both human population and pathogen concentration, constitute three-dimensional nonlinear autonomous systems where the classical Poincaré-Bendixson theory is not applicable. We employ three different techniques, including the monotone dynamical systems, geometric approach, and Lyapunov functions, to investigate the endemic global stability for several biologically important cases. The analysis and results presented in this paper make building blocks towards a comprehensive study of the general mathematical cholera model.

This is the joint work with Jin Wang.