Dynamical analysis of a generalized hepatitis B epidemic model and its dynamically consistent discrete model

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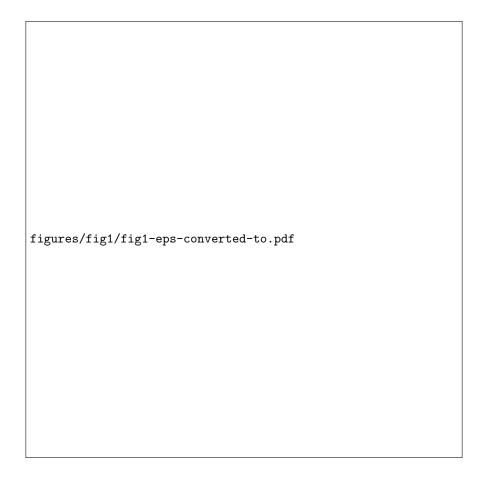
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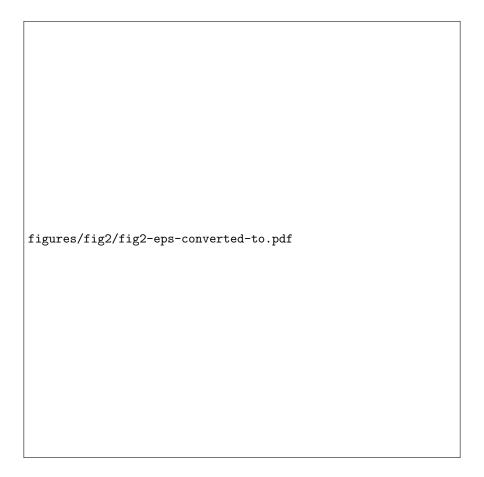
Abstract

The aim of this work is to study qualitative dynamical properties of a generalized hepatitis B epidemic model and its dynamically consistent discrete model. Positivity, boundedness, the basic reproduction number and asymptotic stability properties of the model are analyzed rigorously. By the Lyapunov stability theory and the Poincare-Bendixson theorem in combination with the Bendixson-Dulac criterion, we show that a disease-free equilibrium point is globally asymptotically stable if the basic reproduction number \mathcal{R}_0 head R_0 head a disease-endemic equilibrium point is globally asymptotically stable whenever \mathcal{R}_0 head R_0 head R

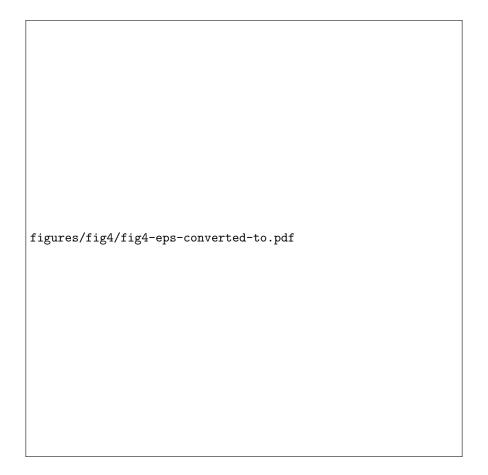
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