

Threshold dynamics for compartmental epidemic models with delays and related problems

Yoichi Enatsu

Graduate School of Mathematical Sciences, University of Tokyo

E-mail: yenatsu@ms.u-tokyo.ac.jp

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Abstract

In this talk, we first present the recent results for the global dynamics of SIR and SIRS epidemic models with delays. Here the delay denotes the length of incubation period in the vector population. By means of a threshold parameter R_0 , known as the basic reproduction number, we establish the asymptotic stability of a disease-free equilibrium (DFE) and an endemic equilibrium (EE). Our results indicate that a disease is eradicated if $R_0 \leq 1$, otherwise the disease persists in a host population if $R_0 > 1$. We also introduce the dynamics of epidemic models with free boundary and offer an example that the disease will be eradicated when the initial infected radius is small even if $R_0 > 1$.