A Continuous Susceptible-Infected-Vaccinated Model for Influenza Infection Dynamics

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Abstract

A current problem in public health is our inability to reliably forecast the timing and intensity of seasonal Influenza. Current models for infectious diseases like SIS (susceptible-infected-susceptible) models inadequately account for the seasonal dynamics of Influenza. Additionally, more complex models like the SIR (susceptible-infected-recovered) model incorrectly assume that recovery confers lasting immunity. This work proposes an SIV (susceptible-infected-vaccinated) which takes into account the time-limited nature of immunity conferred via vaccination as well as the seasonal pattern of Influenza outbreaks.