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Title: Disease Extinction Versus Persistence in Discrete-time Epidemic Models

Abstract: In this talk, we will focus on discrete-time infectious disease models in populations that are governed by constant, geometric, Beverton-Holt or Ricker demographic equations. When $\mathcal{R}_0 < 1$ and the demographic population dynamics are asymptotically constant or under geometric growth (non-oscillatory), we prove global asymptotic stability (GAS) of the disease-free equilibrium (DFE) of the disease models. When $\mathcal{R}_0 > 1$, we prove uniform persistence of the disease, and the existence of a unique endemic equilibrium (EE). We apply our theoretical results to specific discrete-time epidemic models that are formulated for SEIR infections, cholera in humans, and anthrax in animals. Our simulations show that the EE of each of the three specific disease models is asymptotically stable whenever $\mathcal{R}_0 > 1$.
