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Disease extinction versus persistence in discrete-time epidemic models

Discrete-time infectious disease models are formulated in populations that are asymptotically constant, for example, governed by the Beverton-Holt equation. The basic reproduction number $\mathcal{R}_0$ is calculated, and is shown to act as a threshold. If $\mathcal{R}_0 < 1$, then the disease-free equilibrium is proved to be globally asymptotically stable; whereas if $\mathcal{R}_0 > 1$, then the disease persists. Results are applied to specific discrete-time epidemic models that are formulated as SEIR infections (e.g., chickenpox) and anthrax in animals. [This is joint work with Abdul-Aziz Yakubu]