

1077-92-1876

Glenn Lahodny Jr.*, glenn.lahodny@ttu.edu, and **Linda J. S. Allen**. *Extinction or Persistence of Disease in Stochastic Multi-Patch Epidemic Models*.

Stochastic multi-patch SIS epidemic models are derived, continuous-time Markov chains and stochastic differential equations. Patch reproduction numbers and the basic reproduction number are defined for the underlying deterministic model. Applying branching process theory, estimates for the probability of disease extinction are defined for the stochastic epidemic models for isolated patches and for the multi-patch system and expressed in terms of the patch and basic reproduction numbers. Numerical examples are given to illustrate cases where the estimates for probability of disease extinction are good approximations. (Received September 21, 2011)