1014-92-420   **Robert K McCormack*** (`robert.k.mccormack@ttu.edu`), Texas Tech University, Department of Mathematics and Statistics, Lubbock, TX 79409-1042, and **Linda J. S. Allen** (`linda.j.allen@ttu.edu`). *Disease Emergence in Stochastic and Determinstic Multihost SIS and SIR Models.*

In this study, we examine the action of pathogens on multiple hosts. Many pathogens, such as rabies and hantavirus, are associated with a primary host species but can be transmitted to and infect multiple other species. Based on the dynamics of these diseases, we develop epidemic models for pathogens that can infect more than one host. We first examine systems of deterministic epidemic models with multiple hosts for both the SIS and SIR cases. From these models, we formulate a system of Itô stochastic differential equations. Numerical simulations provide a basis for comparison of the dynamics of the deterministic and the stochastic models. While the deterministic models may show the disease will persist, the stochastic models may not always agree. (Received September 15, 2005)