

1086-92-2447

Majid Bani-Yaghoub*, UMKC Department of Mathematics and Statistics, 5100 Rockhill Road, Kansas City, MO 64110. *Modeling and analysis of intermittently shed pathogens capable of environmental persistence*. Preliminary report.

A system of ordinary differential equations is constructed to investigate the evolutionary ecology of pathogen intermittent shedding and the environmental persistence of free-living pathogen. Specifically, by considering various tradeoffs between intermittent shedding and environmental persistence, we show that the overall transmissibility fitness of several infectious agents can be optimized (presumably) through evolution. The stability analysis of the disease-free and endemic equilibria indicates that such optimization can be responsible for several disease outbreaks around the world. Using the data related to E. coli O157:H7 transmission in a cattle-environment system, the impacts of such tradeoffs on the disease dynamics is numerically examined. (Received September 25, 2012)