Meeting: 1003, Atlanta, Georgia, SS 18A, AMS-SIAM Special Session on Recent Advances in Mathematical Ecology, I

1003-92-1260 **Pej Rohani*** (rohani@uga.edu), Institute of Ecology, University of Georgia, Athens, GA 30602, and **Helen Wearing**. *Appropriate Models for the Management of Infectious Diseases.*

Mathematical models have become invaluable management tools for epidemiologists, both shedding light on the mechanisms underlying observed dynamics as well as making quantitative predictions on the effectiveness of different courses of action. Here, we show that substantial biases are introduced by two important, yet largely ignored, assumptions at the core of the vast majority of such models. Specifically, we use analytical methods to show that the basic reproductive ratio estimated from outbreak data will (i) under-estimated if the incubation period is ignored or (ii) over-estimated if the common assumption of exponentially distributed incubation and infectious periods is made. We proceed to document how such unrealistic a priori assumptions concernign model structure give rise to systematically over-optimistic predictions on the outcome of potential control measures. (Received October 04, 2004)