

PHD SEMINAR ANNOUNCEMENT  
Department of Statistics

Modeling Epidemics: SIRS Models

Monday June 30, 2003, 3:00 pm  
Eckhart Hall, Room 133, 5734 S. University Avenue

Regina Dolgoarshinnykh  
Department of Statistics, University of Chicago

**ABSTRACT**

The mechanisms responsible for the spread of infection in a population are often complex and difficult to access. This creates a need for models that simplify the real mechanisms while maintaining the qualitative behavior of the process. A class of such models, SIRS models, has been proposed to study infection spread in a finite population. The letters S,I,R refer to the three possible states an individual in the population may assume in turn: susceptible, infected and recovered.

We describe dynamics of infection spread under SIRS models giving a first order and a diffusion large population approximation to the system. Of interest to epidemiologists is the time until infection disappears. Since the population is finite, in SIRS models this happens in finite time. To estimate this time a diffusion approximation is often assumed. We discuss dangers of such approximations and present a solution to an ensuing large deviations problem.