The George Washington University
Department of Statistics
Spring 2005

SEMINAR ANNOUNCEMENT

Titles:

1. Estimating treatment effects in an unbalanced two period cross-over trial with Poisson outcomes
2. Microbial Diversity in Local Communities

Speakers:

1. Professor Daniel Lunn
   Department of Statistics, Worcester College, University of Oxford
2. Professor Mary Lunn
   Department of Statistics, St Hugh's College, University of Oxford

Date: Thursday, March 24, 2005

Time: 11:00 am – 12:00 pm

Location: Hall of Government (710 21st Street NW), Room 310

Abstracts:

1. In testing a new drug for epilepsy, a group of doctors unfortunately chose to do a cross-over trial with Poisson outcomes. There are obvious problems with analysing the data, which were compounded by the fact that the data set is small (because the trial was expensive), two different types of epileptic seizure were being studied with cases who suffered from one or both types, and there are some missing values. It was hardly surprising that attempts to use generalised estimating equations produced unsatisfactory models, as did mixed effects modelling. However, fitting a Bayesian random effects model not only proved to be successful, but also provided a mechanism, unavailable to any other approach, for handling the two types of seizure by means of suitably chosen prior distributions.

2. An understanding of species distribution and abundance in microbial communities is vital in many areas of engineering and biological sciences. There are enormous problems of scale, both in population size and in diversity. We consider two aspects of the problem.

   First we consider what if anything can be said of species diversity in those studies where a small observed sample of the community consists entirely of singletons, that is to say no species is repeated, and what this implies in general since there are many clone libraries which contain very few repetitions. We are able to draw some conclusions about the minimum levels of species diversity.

   Second we use a neutral community model and its implementation by stochastic differential equations to develop steady state predictions of diversity for a local microbial community. Examples are given, fitting the model to data.

Directions: Foggy Bottom-GWU Metro Stop on the Orange and Blue Lines. The campus map is at `http://www.gwu.edu/~map`.
Contact person: Kaushik Ghosh, Department of Statistics. Email: `ghosh@gwu.edu`, phone: 202-994-6889.
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