BIOSTATISTICS SEMINAR

Defining and addressing dependent observation schemes in life history studies

Richard J. Cook, PhD,
Professor of Statistics, University of Waterloo

Multistate models provide a powerful framework for the analysis of life history processes when the goal is to characterize transition intensities, transition probabilities, state occupancy probabilities, and covariate effects thereon. Data on such processes are often only available at random visit times occurring over a finite period. We formulate a joint multistate model for the life history process, the recurrent visit process, and a random loss to followup time at which the visit process terminates. This joint model is helpful when discussing the independence conditions necessary to justify the use of standard likelihoods involving the life history model alone, and provides a basis for analyses that accommodate dependence. We consider settings with disease-driven visits occur in combination with routinely scheduled visits, and develop likelihoods that accommodate partial information on the types of visits. Simulation studies suggest that suitably constructed joint models can yield consistent estimates of parameters of interest in the presence of dependent visit processes. The biases from intermittent observation of time-dependnt covariates will also be considered along with a multistate approach to mitigating this bias through joint modeling. Two applications will illustrate the benefits of joint modeling disease and observation processes. This is joint work with Jerry Lawless and Bing Feng Xie.

Thursday April 15, 2021   **3:30 pm - 4:30 pm**

Zoom meeting: Please also find a link in the email invite, with the password.
https://uncsph.zoom.us/j/95116832073?pwd=TnV4QUtGLzMwaFRBT1Rsd2xmTjVMQT09