

Department of Mathematics and Statistics Colloquium

A Gamma-Fraily Proportional Hazards Model for Bivariate Interval-Censored Data

Job Candidate

Abstract: The Gamma-frailty proportional hazards (PH) model is commonly used to analyze correlated survival data. Under this model, the regression parameters have marginal interpretations and the statistical association between the failure times can be explicitly quantified via Kendall's tau. In this work, a Gamma-frailty PH model for bivariate interval-censored data is presented and an expectation-maximization (EM) algorithm for model fitting is developed. The proposed model adopts a monotone spline representation for the purposes of approximating the unknown conditional cumulative baseline hazard functions, significantly reducing the number of unknown parameters while retaining modeling flexibility. The EM algorithm was derived from a novel data augmentation procedure involving latent Poisson random variables. The algorithm is easy to implement, robust to initialization, and enjoys quick convergence. Simulation results suggest that the proposed method provides reliable estimation and valid inference, and is robust to the misspecification of the frailty distribution. To further illustrate its use, the proposed method is used to analyze data from an epidemiological study of sexually transmitted infections.

Tuesday, January 16 at 3:30 in Roop 103

Refreshments at 3:15