Einladung zum Biometrischen Kolloquium

MENGGANG YU UND JUN SHAO,

University of Wisconsin-Madison, USA

9. Juli 2019, 10:00h

Seminarraum CeMSIIS, Raumnummer 88.03.513

Medizinischen Universität Wien, Spitalgasse 23, 1090 Wien

HOST: Franz König und Martin Posch

COX REGRESSION WITH NONIGNORABLE SURVIVAL-TIME-DEPENDENT MISSING COVARIATE VALUES

When analyzing time-to-event data in clinical and epidemiological studies with missing covariate values, the missing at random assumption is commonly adopted and it assumes that missingness depends on the observed data, including the observed outcome which is the minimum of survival and censoring time. However, in certain settings, the missingness is likely related to the survival time but not to the censoring time, for example when covariates are measured at baseline and censoring is administrative. In this case, the covariate missingness mechanism is nonignorable as the survival time is censored, and it creates challenge in data analysis. We propose two different estimators to deal with such survival-time-dependent covariate missingness based on the well known Cox regression models. Our method is based on inverse propensity weighting with the propensity estimated by nonparametric kernel regression. Our estimators are consistent and asymptotically normal. The finite-sample performance of the proposed estimators is examined through simulation and by an application to a real-data example.

ROBUST TESTS IN SURVIVAL ANALYSIS UNDER COVARIATE-ADAPTIVE RANDOMIZATION

Covariate-adaptive randomization is popular in clinical trials with sequentially arrived patients for balancing treatment assignments across prognostic factors which may have influence on the response. However, existing theory on tests for treatment effect under covariate-adaptive randomization is limited to tests under linear or generalized linear models, although covariate-

adaptive randomization has been used in survival analysis for a long time and its main application is in survival analysis. Often times, practitioners would simply adopt a conventional test such as the log-rank test or score test to compare two treatments, which is controversial since tests derived under simple randomization may not be valid under other randomization schemes. In this article, we prove that the log-rank test valid under simple randomization is conservative in terms of type I error under covariate-adaptive randomization, and the robust score test developed under simple randomization is no longer robust under covariate-adaptive randomization. We then propose a calibration type log-rank or score test that is valid and robust under both simple randomization and a large family of covariate-adaptive randomization schemes. Furthermore, we obtain Pitman's efficacy of log-rank and score tests to compare their asymptotic relative efficiency. Simulation studies about the type I error and power of various tests are presented under several popular randomization schemes.