

Department of Mathematical Sciences

Colloquium

Candidate for Assistant Professor of Statistics Position

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Analysis of Time-to-Event Data & Intermediate Phenotypes in the OPPERA Study

In a prospective cohort study, examining all participants for incidence of the condition of interest may be prohibitively expensive. For example, the “gold standard” for diagnosing temporomandibular disorders (TMD) is a clinical examination by an expert dentist. In a large prospective cohort study, examining all subjects in this manner is infeasible. Instead, it is common to use a cheaper (and less reliable) examination to screen for possible incident cases and perform the “gold standard” examination only on those who screen positive on the simpler examination. Unfortunately, subjects may leave the study before receiving the “gold standard” examination. This results in a survival analysis problem with missing censoring indicators. Motivated by the Orofacial Pain: Evaluation and Risk Assessment (OPPERA) study, a large cohort study of TMD, we propose methods for parameter estimation in survival models with missing censoring indicators. We estimate the probability of being a case for those with no “gold standard” examination through a logistic regression model. Predicted probabilities facilitate estimation of the hazard ratios associated with each putative risk factor. Multiple imputation produces variance estimates for this procedure. Simulations show that our methods perform better than naive approaches. In addition, we apply the method to data in the OPPERA study and extend the methods to account for repeated measures and missing covariates.

Another problem of recent interest is the analysis of secondary phenotypes in case-control studies. Standard methods may be biased and lack coverage and power. We propose a general method for analysis of arbitrary phenotypes, including ordinal and survival outcomes. We advocate the use of inverse probability weighted methods and estimate the standard error by bootstrapping.

Monday, February 4, 2013, at 3 pm
in Biosciences Bldg. RM: 2.168
The University of Texas at El Paso

Refreshment will be served 15 minutes prior to start of the colloquium

For further information, please contact Dr. Joan Staniswalis, 915-747-6761, email:
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