DEPARTMENT OF STATISTICS COLLOQUIUM SERIES

Texas A&M University

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A NOVEL PSEUDO-OBSERVATIONS-BASED MODELING APPROACH FOR INTERVAL-CENSORED DATA

ABSTRACT:

In many medical studies, event times are recorded in an interval-censored (IC) format. For example, in numerous cancer trials, time to disease relapse is only known to have occurred between two consecutive clinic visits. Many of the existing modeling methods in the IC context are computationally intensive and usually require numerous assumptions that could be unrealistic or difficult to verify in practice. We propose a novel, flexible and computationally efficient modeling strategy based on pseudo-observations (POs) obtained using the leave-one-out jackknife. The POs obtained based on a nonparametric estimator of the survival function are employed as outcomes in an equivalent, yet simpler regression model that produces consistent covariate effect estimates. Hence, instead of operating in the IC context, the problem is translated into the realm of generalized linear models, where numerous options are available. Outcome transformations via appropriate link functions lead to familiar modeling contexts such as the proportional hazards, proportional odds or accelerated failure time models. Moreover, the methods developed are not limited to these settings and have broader applicability. Simulations studies show that the proposed methods produce virtually unbiased covariate effect estimates, even for moderate sample sizes. An example from the International Breast Cancer Study Group Trial VI further illustrates the practical advantages of this new approach.

Jointly hosted with the Department of Epidemiology and Biostatistics.

DATE: Thursday, September 17, 2009
TIME: 11:10 a.m. – 12:10 p.m.
PLACE: Room 150, Blocker

Refreshments will be served in the Statistics Conference Room at 10:30 am for those attending the seminar.