
New Statistical Design and Analysis for Epidemiological Investigations

Organizer and Chair: Yutaka Yasui (University of Alberta)

MASOUD ASGHARIAN, McGill University

Prevalent Cohort Design and Analysis: A Case Study

Logistic or other constraints often preclude the possibility of conducting incident cohort studies. A feasible alternative in such cases is a prevalent cohort study. When the interest lies in estimating the lifespan between an initiating event, experienced before the start of the study, and a terminating event, the prevalent subjects may be followed prospectively until the terminating event or loss to follow-up. These prevalent cases have, on average, longer lifespans and hence do not constitute a representative sample from the target population. I discuss the challenges in analyzing such data and illustrate recently developed methodologies using data from the CSHA.

JUXIN LIU, University of Saskatchewan

Interactions and Average Predictive Comparison

In a regression model with interactions, an individual regression coefficient itself cannot provide insightful explanation regarding the effect of a particular predictor. Therefore, we consider an average predictive comparison (APC, Gelman and Pardoe 2007) as a target of inference. Particularly, in light of the difficulties in dealing with interaction terms in regression models, we examine inferences about APC when additive models are fitted to relationships truly involving pairwise interaction terms. We consider two different versions of APC and two different regression contexts.

JOSE MIGUEL MARTINEZ, Universitat Pompeu Fabra, Spain

Improving Multilevel Analyses: the Integrated Epidemiologic Design and its Extension

The “Integrated Design” combines population-level data and individual-level data into a unified analysis, and is an alternative to the “Multilevel Design” for assessing both “contextual” and “individual” covariate effects on outcomes. Its inference can be based on population-based estimating equations (PBEEs), or a Bayesian approach. Simulation studies show its efficiency advantage, especially for contextual covariates. In this talk, I will discuss the general framework of the Integrated Design for both risk and censored survival/rate data and its extension to handle missing data using weighted PBEEs. Advantages of this new design over the Multilevel Design will be illustrated with real data.