

STATISTICS COLLOQUIUM

MONDAY, MARCH 17, 2008

TALK: 4:00 PM — SCIENCE CENTER RM. 309

RECEPTION: 5:15 PM — SCIENCE CENTER, 7TH FLOOR

“LONGITUDINAL NESTED COMPLIANCE CLASS MODEL IN THE PRESENCE OF TIME-VARYING NONCOMPLIANCE”

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ABSTRACT

We propose nested latent compliance class models in the Imbens and Rubin (1997) compliance model framework for analyzing longitudinal randomized trials when subjects do not always adhere to the treatment to which they are randomized, and treatment adherence may vary over time. Traditional “intention-to-treat” and “as-treated” analyses may produce biased causal effect estimates in the presence of subject noncompliance. Utilizing nested latent compliance class models that use subject-specific and time-invariant “superclasses” allow us to summarize longitudinal trends of compliance patterns, and estimate the effect of the intervention using “intent-to-treat” contrasts within principal strata (PS) corresponding to longitudinal compliance behavior patterns. First we propose a conditional independence model where the time-varying compliance classes within a subject are assumed to be independent given compliance superclass and covariates. Then we propose a Markov model where time-varying compliance classes are assumed to relate to history of compliance, compliance superclass, and covariates. Finally, we search for good predictors of longitudinal compliance and examine the relationship between longitudinal compliance and mortality. We illustrate these models with analyses of the Prevention of Suicide in Primary Care Elderly: Collaborative Trial (PROSPECT), a randomized intervention study of elderly patients in primary care clinics with depression.