SEMI-PARAMETRIC STRUCTURAL PROPORTIONAL HAZARDS MODELS FOR THE EFFECT OF NON-COMPLIANCE IN AN HIV PREVENTION TRIAL

E. Goetghebeur

Ghent University, Gent, Belgium and Harvard School of Public Health, Boston, MA, USA

[†]E-mail: els.goetghebeur@ugent.be

HIV prevention and AIDS treatment in Africa are among the most important challenges in public health today. With large scale programs bringing free treatment to poor resource areas, imperfect adherence has become a big concern. Poor compliance can generate treatment resistance and could ultimately make the free treatments harmful. In this talk we propose Structural Proportional Hazards models as an alternative for Structural Accelerated Failure Time models to evaluate the effect of observed treatment exposure on HIV incidence in a randomized HIV prevention trial. We use those models to examine the direct and indirect impact of imperfect compliance in this setting. Current implementation of this methodology restricts flexible model fitting as it involves demanding grid searches for the estimation of more dimensional structural parameter spaces and their precision. To overcome some of these limitations we invoke an auxiliary model for potential exposures and solve score equations averaged over multiple imputations for causal parameters. Asymptotic properties are derived and small sample behavior verified by simulation. We end with a discussion of the problem of measurement error on these exposure data and their possible impact.