



JOHNS HOPKINS
BLOOMBERG
SCHOOL of PUBLIC HEALTH

Department of Biostatistics

HIERARCHICAL BAYESIAN MODELING OF ZERO-INFLATED LONGITUDINAL PATIENT-REPORTED OUTCOMES AND SURVIVAL

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ABSTRACT

Clinical trials frequently record longitudinal observations in the course of medical management of study participants. They are secondary to, but may be strongly associated with, primary trial endpoints such as time to progression or death, and are subject to informative censoring when such terminal events occur. Models that consider these two types of data simultaneously have been shown to reduce bias and increase efficiency. Therefore, we build hierarchical Bayesian joint models for longitudinal and survival data that depend on individual-specific latent disease trajectories. This approach affords substantial flexibility in accommodating association among outcomes and across times. We add an additional set of submodels to the usual joint modeling framework to incorporate zero-inflation in the longitudinal data. I will outline a general framework for such models, including those that consider multiple longitudinal outcomes, and demonstrate their use in a clinical trial of treatment for malignant pleural mesothelioma.

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