SEMIPARAMETRIC MODELS AND SENSITIVITY ANALYSIS OF LONGITUDINAL DATA WITH NON-RANDOM DROPOUTS

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We propose a family of semi-parametric non-response models to adjust for informative dropouts in the analysis of longitudinal data. The approach conceptually focuses on generalized linear mixed effects models that describe individual trajectories. A novel formulation of a shared latent variable model is presented and shown to provide parameters that have a meaningful interpretation. We show how the non-identifiability of some model characteristics can be used to delineate the range of inferences consistent with observed data and to evaluate hypotheses using global sensitivity tests. To reduce the complexity of the sensitivity analysis, the random effects distribution is estimated non-parametrically, and simulations demonstrate a large reduction of bias relative to the parametric model at times where the dropout rate is high or the dropout model is misspecified. The methodology's practical utility is illustrated in a psychiatric data analysis.