

Evaluating Latent Transition Regression Models for Mixed Outcomes

Diana L. Miglioretti

Health status is often a complex outcome, characterized by multiple measures that may be of mixed type and recorded repeatedly over time. For example, when studying interventions aimed at the prevention of chronic back pain, measures of pain intensity, persistence, interference with activities, and work disability are collected for lack of a single suitable measure of pain severity. These measures include mixtures of continuous, categorical, and count data. The analytic challenges posed by these data may be addressed using a Bayesian latent transition regression model for jointly analyzing a mixture of longitudinal outcomes from any set of distributions. Health status is assumed to be a categorical latent variable, and the multiple outcomes are treated as surrogate measures of the latent health state, observed with error. Both the baseline latent health state prevalences and the probabilities of transitioning between the health states over time may be modeled as functions of covariates. While Bayesian simulation methods provide the flexibility necessary for fitting these complex latent class models, diagnosing the adequacy of model fit and validity of model assumptions remain important but challenging aspects of model fitting. In this talk, I will introduce the Bayesian latent transition regression model for mixed outcomes and illustrate some diagnostic approaches for testing the adequacy of model fit and the validity of model assumptions using data from a longitudinal back-pain study.