A COMPARISON OF STATISTICAL METHODS FOR THE ANALYSIS OF BINARY REPEATED MEASURES DATA

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The objective of the study was to assess the performance of statistical methods for the analysis of binary repeated measures data. Two simulation studies were carried out, using relatively small, balanced, two-level (time within subjects) datasets. The first study was based on a marginal model with first order autocorrelation, the second on a random effects model with autocorrelated subject random effects. Two versions of the models were considered, with a binary treatment either between or within subjects. Among the statistical procedures studied were Generalized Estimating Equation, Marginal Quasi Likelihood, Likelihood based on numerical integration, Penalized Quasi Likelihood and Bayesian Markov Chain Monte Carlo. Results for the marginal model showed autoregressive GEE to be highly efficient when treatment is within subjects, even with strongly correlated responses. When the treatment is between subjects, random effects methods also work well, however, small number of subjects with short time series still pose a challenge for both marginal and random effects methods. Results for the random effects model showed bias in estimates from both marginal and random effects methods for a random effect variance of 1 and moderate autocorrelation.