

Inferences in semi-parametric dynamic mixed models for longitudinal count data

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Received: 21 February 2016 / Revised: 15 August 2016 / Published online: 28 November 2016
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Abstract This paper considers a semi-parametric mixed model for longitudinal counts under the assumption that for conditional on a common random effect over time the repeated count responses of an individual follow a Poisson AR(1) (auto-regressive order 1) non-stationary correlation structure. A step-by-step estimation approach is developed which provides consistent estimators for the non-parametric function, regression parameters, variance of the random effects, and auto-correlation structure of the model. Proofs for the consistency properties of the estimators along with their convergence rates are derived. A simulation study is conducted to examine first the estimation effects on parameters when the non-parametric function is ignored, and then an overall estimation study is carried out in the presence of the non-parametric function by including its estimation as well.

Keywords Consistency · Dynamic relationship for repeated counts · Generalized quasi-likelihood · Longitudinal correlations · Overdispersion of main interest · Parametric and non-parametric functions · Random effects and their variance · Regression effects of main interest · Semi-parametric model and estimation

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