QUADRATIC INFERENCE FUNCTIONS FOR MIXED EFFECTS MODELS IN LONGITUDINAL DATA ANALYSIS

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In longitudinal studies, mixed effects models are useful to address subject-specific behavior. However, random effects are mostly assumed to follow a normal distribution and the variance components of random effects are challenging to estimate without likelihood functions. We propose a new approach to estimate fixed and random effects using quadratic inference functions under nonparametric framework. The new approach does not require the specification of likelihood functions and also takes correlations into account. The advantage of the new approach is that it does not require estimation of correlation parameters for estimation of fixed effects or variance components. In addition, it allows us to perform weighted chi-squared tests for testing whether the variance components of random effects are significant or not. A real data example and simulations are illustrated using our approach.