A Comparison of a Rank-Based Method and Normal Theory Method for Cluster Correlated Data

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Abstract

Rank (R) estimation of the fixed effects in a linear model with cluster correlated data will be presented. The R-estimation will be based on joint rankings (JR) of all the residuals. Robust estimators of the variance components will be presented. The estimators of variance components will be used to compute studentized residuals for the JR fit and for the generalized JR estimates. An example from a clinical trial will be discussed, which will illustrate the efficiency of the JR analysis over the normal theory analysis. A small scale Monte Carlo study comparing the rank-based test and the normal theory test will be reported.