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**Title:** Robust Model Fitting Approach for Linear Mixed Models; An application to Small Area Estimation

**Abstract:** Outliers are a well-known problem when fitting models with survey data. Estimates of the model parameters and also prediction of population quantities using the fitted model become unstable in presence of outliers in data. The main approaches that have been developed so far for this problem have focused on modifying the parameter estimating equations to make them less sensitive to sample outliers. To the best of our knowledge, there has been no attempt to use outlier robust Monte Carlo methods to tackle this problem. We propose an outlier robust approach that can be used to fit a linear mixed model in the presence of outliers in data. Moreover, we describe Monte Carlo simulation results that provide some evidence for our major findings.