APPLICATIONS OF LINEAR MIXED MODELS DIAGNOSTICS

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Model diagnostics are important for statistical data analyses, because they allow the analyst to understand the impact of individual (or a subset of) observations in determining estimates, test and other statistics. However, data analysts generally apply mixed model to data which have both fixed and random effects without assessing the influence of observations. The basic reasons are (1) the lack of routine methods (in the literature and standard computing packages) for performing such analysis, and (2) the presumably high costs (in an analyst and computer time) in doing so. We provide routine diagnostic tools, which are computationally inexpensive, for linear mixed models. The diagnostics are a function of basic building blocks, computed only once from the complete data analysis, and provide information on the influence of the data on different aspects of the model fit. To demonstrate the utility of the diagnostic tools, we illustrate with a number of data sets.