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Complex Sampling Design Based Familial Longitudinal Health Data Analysis: An Overview

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Abstract

In health studies, it is quite common to collect binary or count repeated responses along with a set of multi-dimensional covariates over a small period of time from a large number of independent families, where the families are selected from a finite population by using certain complex sampling designs. It is of interest to examine the effects of the covariates on the familial longitudinal responses after taking the variation in the family effects as well as the longitudinal correlations of the repeated responses into account. In this paper, I review the advantages and drawbacks of the existing methodologies for the estimation of the regression effects, the variance of the family effects and the longitudinal correlations. We then outline the advantages of a new unified generalized quaslikelihood approach in analyzing the complex design based familial longitudinal data. Some existing numerical studies are discussed as illustrations of the methodologies considered in the paper.

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