Abstracts

Asymptotic properties of L_1 estimators in a multi-stage dose-response model: A Monte Carlo study

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Abstract: The single-stage and two-stage dose response models are frequently used in practical applications. The maximum likelihood and the least squares principles are often used to estimate the unknown parameters of the model. It has been shown that these methods are sensitive to outliers in the data. The minimum sum of absolute errors MSAE (or L_1) criterion is more resistant to outliers than these popular procedures. However, at present not much is known about the statistical properties of the MSAE estimators of the parameters of the multistage dose-response model. In this paper, our objective is to study asymptotic properties and distribution of the MSAE estimators of the single-stage and two-stage dose-response models by simulation and to find the smallest sample size for which we may use the asymptotic distribution to draw statistical inferences about the parameters. We also give an approximate expression for the variance of these estimators when their asymptotic distribution follows a multinormal distribution.

The L^1-norm and interlaboratory tests

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Abstract: The form of interlaboratory test we consider is that where each of I laboratories returns exactly one reading for each of J sanples. Such a test may be described by the random effects model

$$X_{ij} = X_i + a_j + \epsilon_{ij}, \quad 1 \leq i \leq I, \quad 1 \leq j \leq J.$$

The X_i represent the laboratory effects, the a the sample conaminations and the ϵ_{ij} the measurement errors. The problem is to identify outlying observations and outlying laboratories. As we have only one observation per cell it is commonly believed that it is not possible to detect outliers or, equivalently, non-additivity. As shown in Terbeck and Davies (1996) this is not correct and so called unconditionally identifiable outlier patterns may be found by the L^1- or an appropriate M-functional. The results