

ISOTONIC REGRESSION ANALYSIS APPLIED TO TESTS PROBIT IN SEQUENTIAL DOSE-RESPONSE

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- **ABSTRACT:** *Several methods for analysis of susceptibility data obtained in dose-response essays aim to estimate a dose that will produce certain effects in $I\%$ of a population. Initially the methods aimed at studying the dose to which $I=50\%$, commonly called LD_{50} (Lethal Dose 50%). Methods such as probit and Up and Down efficiently estimate this dose, being that the the Up and Down method, based on the theory of sequential designs, has the advantage of reducing the sample size. An alternative design derived from the Up and Down is the biased coin design, which is effective for the estimation of any quantile of the tolerance curve. As the dose-response curve is generally increasing, an appropriate statistical method for the estimation process is the isotonic regression. The aim of this work was to propose an estimator that uses isotonic regression to be applied in probit analysis for sequential designs. To evaluate the performance of the estimator the Monte Carlo simulation was used, calculating the mean squared error (MSE) and bias for different sample sizes. The results indicate the feasibility of the practical use of the proposed estimator.*
- **KEYWORDS:** *Order restrictions; sequential design; distribution of tolerances; Up and Down method; biased coin design.*

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