Regression models with measurement error applied to data from test laboratories.

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Abstract: *Regression models are statistical tools that can (among other purposes) relate the average value of the variable of interest (response variable) to one or more covariables (explanatory variables). In practical situations, it may happen that some covariates associated with the response variable are measured with error (Eveliny, 2018). In this case, the estimators obtained by conventional methods can be biased and inconsistent. In order for us to take actions that minimize the effects of these possible errors, we need to understand them better. These errors may occur due to various circumstances, eg problem in data collection: error in interview or questionnaire interpretation, dishonesty response errors, confusion, ignorance etc., lack of adequate interviewer training or error in the method used for to obtain the response, equipment failure, which may be due to component wear, lack of calibration or environmental conditions, which generates variability in reading instruments etc. For this reason, the purpose of this work is to present the regression models with measurement error in the covariables, the representations of the measurement error and some estimation methods that can be used to correct the measurement error problem in the variables. In addition to the theory, results from a simulation study and a multiple linear regression analysis performed on a dataset concerning soybean yield (per hectare) against chemical soil variables is also presented.*

Keywords: *Multiple regression models, models with errors in covariables and analysis of diagnoses.*

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