## E1-37: A Study of defective analysis of glass bottles

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This study aims to identify factors effecting generation of defective glass bottles which is the major problem faced by the Ceylon Glass Company. Production speed, colour of the bottle, type of the bottle (shape), production level, crew group, weight of the bottle, production shift, production line (machine), are some of the factors which have direct implication on production. Modelling approach is used, since the univariate approach for each factor provides significant individual factors for generating defectives and is not an accurate method for identifying factor combinations. As the response variable was binary, the logistic regression model is fitted for the factors which were identified by the univariate analysis.

According to the preliminary study "Type of the bottle" is found to be the most significant factor. However due to the non convergence of higher order interaction terms when all the data types were taken together, the data set was divided into separate 'type of bottles' and this study was proceeded with the bottle type "Horlicks".

The package GLIM provides the facility to model the data in the presence of structural zeros. Hence the GLIM package has been used instead of statistical package SAS because the data set consists of structural zeros. Diagnostic of the model is carried out in order to identify the following: the adequacy of linear predictor to explain the behaviour of the response variable, adequacy of the link function and checking of outlires and influential observations. Above diagnostic tests were satisfied and finally the model was interpreted using odds ratios.