

Using generalized non central t-distribution for estimation of confidence interval of coefficient of variation

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The use of statistics in pharmaceuticals is increasing with advanced statistical methods being widely incorporated by the medical researchers and pharmacologists. Statistics methodologies are pivotal to determine the quality and maintain consistency in pharmaceutical drugs. The dataset for our research consists of weight measures for a pharmaceutical drug for different dosages. To maintain the consistency of the drug during production stage, a coefficient of variation range is obtained that can be treated as the standard in drug production stage.

We observe that the inverse of the coefficient of variation of this dataset has a non-central t distribution and aim to obtain a confidence interval for this inverse coefficient of variation by employing the model of generalized t-distribution. The parameters for the generalized t-distribution being utilized are obtained by applying method of moments and optimized to obtain the narrowest confidence interval for the inverse of coefficient of variation. We then make use of this confidence interval for the inverse coefficient of variation to acquire confidence interval for the coefficient of variation.

The developed model is then validated by comparing it with classic McKay approximation method for normal and Gamma distributions to monitor how the model performs in comparison to an existing model.