

Improved estimation of the mean by using coefficient of variation as a prior information in ranked set sampling

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Abstract

Estimation of population parameters is considered by several statisticians when additional information such as coefficient of variation, kurtosis or skewness is known. This estimation technique is called improved estimation. Searls (1964), Khan (1968) and Arnholt and Hebert (1995) utilized the known coefficient of variation on improved estimating the population mean.

RSS, which has been developed by McIntyre (1952), is a sampling procedure that can be viewed as a generalization of the simple random sample (SRS). This method is applied for situations in which measuring a variable is costly or difficult, but where ranking in small subsets is easy. As it was proved by McIntyre, mean of this sample is an unbiased estimator of the population mean. Additionally, it is well-known that population parameters can be estimated more efficiently using a RSS as opposed to a SRS. This paper is concerned with the improved estimation of the population mean by using coefficient of variation as a prior information in ranked set sampling (RSS). Compare it with the estimator of the mean in RSS, the estimator of the mean in Simple Random Sampling (SRS) and improved estimator of the mean in Simple Random Sampling (SRS) in the sense of Mean Square Errors (MSE). It is observed that the proposed RSS estimator is more efficient than others.

Keywords

Ranked set sample, Improved estimation, Efficiency, Mean squared error, Coefficient of variation.

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