

Ranked set sampling versus simple random sampling in the estimation of the mean and the ratio

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Abstract

It is common in practice that the experimental units can be ranked easily using a cheaply measurable covariate than quantification of the main variable of interest which requires expensive measurements. In such situation ranked set sampling is more beneficial and cost effective. Environmental monitoring and assessment, for example, requires observational data where the ranked set sampling is proved to achieve observational economy when compared to the traditional simple random sampling. Ranked set sampling employs judgement ordering to obtain the actual sample and hence yield a sample of observations that is more representative of the underlying population. Therefore, either greater confidence is gained for a fixed number of observations, or for a desired level of confidence, a smaller number of observations is needed. In either way it is a big gain to the researcher. In this paper, we introduce the basic concepts of ranked set sampling and its application in the estimation of the population mean and the ratio using a real data set on body measurements.

Keywords : *Ranked set sample (RSS), simple random sample (SRS), population ratio, population mean, relative precision, relative saving, empirical efficiency.*

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