OPTIMAL WEIGHTS FOR RANKED SET SAMPLING WITH SKEW DISTRIBUTIONS

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SUMMARY

Ranked Set Sampling (RSS) is a useful technique for improving the estimator of population mean when the sampling units in a study can be easily ranked than the actual measurement. RSS performs better than simple random sampling (SRS) when the simply mean of units corresponding to each rank is used. The performance of RSS can be increased further by assigning weights to the ranked observations. In this paper, we propose simple weighted RSS procedure to estimate the population mean of positively skew distributions. Two different cases of unequal weights are considered. It is shown that the gain the in relative precisions of the population mean for chosen distributions are uniformly higher than those based on balanced RSS. The gain in relative precisions are substantially higher. Further, the relative precisions of our estimator are slightly higher the ones based on Neyman's optimal allocation model for small sample sizes. Moreover, it is shown that, the performance of the proposed estimator increases as the skewness increases by using the example of lognormal family of distribution.

Keywords: Ordered observations; Neyman's allocation; Relative precision; Skewness; Unbiased estimator.