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Estimation of Rare and Clustered Population Mean Using Two Auxiliary Variables in Adaptive Cluster Sampling

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Abstract : Adaptive cluster sampling (ACS) is specifically developed for the estimation of highly clumped populations and applied to a wide range of situations like animals of rare and endangered species, uneven minerals, HIV patients and drug users. In this paper, we proposed a generalized semi-exponential estimator with two auxiliary variables under the framework of ACS design. The expressions of approximate bias and mean square error (MSE) of the proposed estimator are derived. Theoretical comparisons of the proposed estimator have been made with existing estimators. A numerical study is conducted on real and artificial populations to demonstrate and compare the efficiencies of the proposed estimator. The results indicate that the proposed generalized semi-exponential estimator performed considerably better than all the adaptive and non-adaptive estimators considered in this paper.

Keywords : auxiliary information, adaptive cluster sampling, clustered populations, Hansen-Hurwitz estimation
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