An unequal-probability replication variance estimator for large-entropy sampling designs

Emilio López Escobar

We propose a replication variance estimator for functions of estimated totals. The proposed estimator is defined for stratified uni-stage unequal-probability without-replacement large-entropy sampling designs. It is consistent, free of joint-inclusion probabilities and double sums, and it approximates numerically the linearisation variance estimators. For a total and equal probabilities within strata, it reduces to the stratified simple random sampling variance estimator. In the comparable case of a ratio, simulations show that it can be more accurate than alike methods when probabilities are highly correlated with the variable of interest, and when using very small sample sizes.

KEY WORDS: Gateaux derivative; Jackknife; Joint inclusion probability; Pseudovalue; Taylor linearisation.