

# Cut-Off Sampling

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**Abstract:** In sampling theory skewed distributions of many of the survey variables in a population make use of classical tools difficult. One possible solution is cut-off sampling, which discards a part of the population from the sampling frame. Although cut-off sampling is common among practitioners, its theoretical foundations are weak because the inclusion probabilities of some of the units are zero. In this article we propose a framework that justifies cut-off sampling and provides a means for determining census and cut-off thresholds. We use an estimating model that assumes that the sizes of the discarded units for each variable are known. We compute the variance of the resulting estimator and its bias. We develop a mean-squared-error-minimizing algorithm as a function of multivariate auxiliary information at the population level. Due to the multivariate nature of the model, we employ the theory of stochastic relaxation and use the simulated annealing algorithm.

**Key words:** Cut-off sampling; skewed populations; model-based estimation; optimal stratification; simulated annealing.