Abstract

Sousa et al. (2010) and Gupta et al. (2012) proposed ratio and regression estimators for the mean of a sensitive variable that outperform the ordinary mean estimator based on the Randomized Response Technique (RRT). Recently, these estimators are extended to stratified sampling in the work of Sousa et al. (2014), Mushtaq et al. (2016), and Noor-Ul-Amin et al. (2018). In this study, generalized scrambling in stratifies random sampling (StRS) for optional randomize response model (ORRM) is discussed. A new generalized mean estimator is offered for StRS under ORRM. The privacy of the respondent is also elaborated for the proposed model. A generalized exponential type estimator for two-stage ORRM under StRS is suggested. Another generalized exponential ratio-type estimator for StRS utilizing two auxiliary variables is presented. Finally, bias and mean square error (MSE) for the general class of this proposed generalized estimator are derived. The suggested estimators' performance is hypothetically compared to the performance of existing estimators. The empirical analysis agrees that the proposed estimator is outperforming the counterpart estimators and also controlling the response bias by utilizing the ORRM in StRS, as StRS itself helps to reduce the bias.