

# Abstract

Surveys commonly involve the inquiry of sensitive questions by direct interview. However, respondents may not want to reveal much; they choose to evade the questions or provide socially acceptable answers. This leads to two kinds of errors: non-response errors and response bias that compromise the quality of survey results. Randomized response technique is introduced to deal with such situations. It encourages respondents to cooperate by allowing them to reveal less.

Our project applies the technique of randomized response to estimate the domain mean of a sensitive measurement for individuals with a sensitive categorical trait in a dichotomous population. Both quantitative and qualitative variables are utilized. The suggested procedure employs three continuous distributions to extract data from each respondent's classification and make multiplicative scrambled response from his true numerical value. We propose a simpler method that requires only two continuous distributions for the randomization and analyze it under the case of a bivariate normal distribution. During the derivation process, population mean estimators of the measurement attribute are also formed. Our proposed estimators have smaller variances than the suggested estimators when appropriate parameter values are chosen. Smaller variability can occur when we assign close mean values for the randomizing distributions. Mean values that do not differ much conceal the respondents' identities. As a result, our proposed method is able to achieve accuracy and anonymity together with simplicity in its estimation of both the domain and population means.