## An alternative to Kim and Warde's mixed randomized response model

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## Abstract

When open or direct surveys are about sensitive matters (e.g. gambling habits, addiction to drug and others intoxicants, alcoholism, proneness to tax invasion, induced abortions, drunken driving, history of past involvement in crimes, and homosexuality), non-response bias and response bias become serious problems because people oftentimes do not wish to give correct information. To reduce non-response and response bias, various alternative approaches have been proposed, for example a randomized response survey technique, or a mixed randomized response model using simple random sampling with a replacement sampling scheme that improves the privacy of respondents, proposed by authors Kim and Warde. In this paper we have suggested an alternative to Kim and Warde's mixed randomized response model to estimate the proportion of qualitative sensitive variable under the conditions presented in both the cases of completely truthful reporting and less than completely truthful reporting by the respondents. Properties of the proposed randomized response model to stratified random sampling. Numerical illustrations and graphs are also given in support of the present study.

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*Keywords:* Randomized response technique, Dichotomous population, Estimation of proportion, Privacy of respondents, Sensitive characteristics.

## 1. Introduction

Warner (1965) was first to introduce a randomized response (RR) model to estimate the proportion for sensitive attributes including homosexuality, drug addiction or abortion. Greenberg et al. (1969) proposed the unrelated question RR model that is a variation of Warner's (1965) RR model. Since the work by Warner (1965), a huge literature

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