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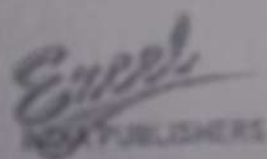
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AN Endowed Optional Stratified Unrelated Question Randomized Response Model

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Abstract—Taking the cue from the pioneer work of Kim and Elam's (2007) we have developed a stratified unrelated question randomized response model based on Mangat (1991) randomizer. It is shown that the proposed model is more efficient than Kim and Elam's (2007) for the estimation of π . Numerical illustrations and graphs are also given in support of the present study.

Keywords Randomized Response Technique, Stratified Random Sampling, Estimation of π , Neyman Allocation

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INTRODUCTION

One of the leading paraphernalia for obtaining data pertaining to human population is the social survey. To measure opinions, attitudes, and behaviors that cover a wide band of interests, the social survey has been established as being tremendously practical. The surveys are conducted due to many reasons, non-availability of certain facts, information in the archives being the most understandable and apparent. For instance, if one is interested in knowing crime rate, information about unseen crimes or unknown victimization experience is not available in formal records on crimes. Sometimes the facts about the individuals (in a population) are inaccessible to the investigators for valid reasons. Questionnaires, in particular social surveys, generally consist of many items. Some of the items may be about sensitive/high risk behavior, due to the social stigma earned by them. One problem with research on high-risk behavior is that respondents may consciously or unconsciously provide incorrect information. In psychological surveys, a social desirability bias has been observed as a major cause of distortion in standardized personality measures. Survey researchers have similar concerns about the truth of survey results. Findings about such topics as drunk driving, use of marijuana, abortion, illicit drug use, induced abortion, shop lifting, child abuse, family dissolution, cheating in exams, HIV/AIDS, and sexual behavior. The most recent problem is modern retail social problems that are sensitive in nature (e.g. misanthropism and major tax evasion, etc.) is lack of reliable measure of their incidence or prevalence. To obtain trustworthy data on such confidential matters, especially the sensitive ones, instead of open surveys alternative procedures are required. Such an alternative procedure known as "randomized response technique" (RRT) was first introduced by Warner (1965).