



An Adroit Randomized Response New Additive Scrambling Model

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ABSTRACT

In this paper, an improved new additive model has been proposed. The proposed model is found to be more efficient than the randomized response models studied by Gjestvang and Singh (2009) and Singh (2010). The relative efficiency of the proposed model has been studied with respect to the Gjestvang and Singh (2009) and Singh (2010) model. It is found that the envisaged model is superior to those additive models earlier considered by Gjestvang and Singh (2009) and Singh (2010). Numerical illustrations are also given in support of the present study.

Key Words: Randomized response sampling, Estimation of proportion, sensitive quantitative variable.

1. INTRODUCTION

Warner (1965) was first to introduce a randomized response (RR) model to estimate proportion for sensitive attributes including sexual orientation, criminal activity, child abuse, suicidal tendency in teenagers, all cases of AIDS, abortion or drug addiction, such that the respondent's privacy should be protected. Some recent contribution to randomized response sampling is given by Fox and Tracy (1986), Singh and Mathur (2004, 2005), Gjestvang and Singh (2006,

2009), Gupta et al. (2010,2012) and Singh and Tarray (2013, 2014, 2015). We below give the description of the models due to Gjestvang and Singh (2009) and Singh (2010) additive models:

1.1 Gjestvang and Singh (2009) additive model:

Let α and β be two known positive real numbers. Then Gjestvang and Singh (2009) proposed an additive model in which each respondent in the sample is requested to

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