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A GENERALIZED CLASS RATIO-TYPE ESTIMATOR OF POPULATION MEAN BASED ON POST STRATIFICATION AND SUB-SAMPLING OF NON– RESPONDENTS

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ABSTRACT

Several authors have considered estimators aimed at reducing the bias due to nonresponse in the estimation of the population mean, of a study variable $\bar{y}$. Hansen and Hurwiz (1946) suggested a simple unbiased estimator $\bar{y}^*$, in their attempt to reduce the nonresponse bias present in a survey. Similarly, Rao (1986) proposed an unbiased estimator y_{ps} for practical situations that do frequently arise whereby one considers it desirable to make use of an auxiliary variable x (with full response) in post-stratifying the nonrespondents, even though its population mean $\bar{X}$, as well as the sampling frame within each stratum are both unknown, and the strata weight $W_{h(h=,....,L)}$-obsolete. Sodipo (1998) developed the work of Rao (1986) by constructing a ratio-type estimator g_1, which was shown to be more efficient. In this present study, we propose a class ratio-type estimator g_2, which is proved (theoretically and empirically) to be more efficient than, and also contains, the last two of the three existing estimators mentioned earlier. Expression for the optimum values of n and $k_{h(h=2...,L)}$ are also derived, using a relevant cost function.

Keywords: Mean, estimator, post-stratification, auxiliary variable, nonresponse.