

ALLOCATION TO RESPONSE AND NON-RESPONSE GROUPS IN TWO CHARACTER STRATIFIED SAMPLING

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ABSTRACT. In this paper, we consider the problem of sample allocation in stratified sampling for two characters in presence of partial non-response. The population in each stratum is divided into three groups: one of complete non-respondents, the second with response to questions of category I and third with response to questions of both the categories. It is assumed that the respondents of the questions of category II always reply the questions of category I but not necessarily the vice versa. Using the Hansen and Hurwitz (1946) technique, we determine the sample sizes and the subsampling proportion of various strata.

1. Introduction. During the past several years, the number of surveys, as a means of collecting a variety of data, has greatly increased in most countries. Any survey, whatever its type and whatever the method of collecting data, will suffer from some non-response. Most practicing Statisticians or data analysts recognize non-response as an important measure of quality of data since it affects the estimates by introducing both a possible bias and an increase in sampling variance. In case of stratified population, the problem of determining the initial sample size to be drawn and the value of subsampling proportion for each stratum to be drawn on the second occasion was considered by Khare (1987) in case of fixed cost as well as in case of specified precision. Further improvement in the estimation of population mean in presence of non-response has been made by using information on auxiliary character. In this direction some conventional and alternate ratio, product and regression type estimators have been proposed by Rao (1986, 1987, 1990) and Khare and Srivastava (1993, 2000), when the population mean of the auxiliary character is known or unknown.

2. Sample size selection for single strata. Let $Y_{i1}, Y_{i2}, \dots, Y_{iN_i}$ be the N_i units of the i th stratum ($i = 1, 2, \dots, L$) be independently identically distributed with mean \bar{Y}_i and the variance S_i^2 . The population of each stratum is divided into two classes, those who will response at the first attempt and those who will not response, hence creates the problem of incomplete sample in the mail survey. We propose the following scheme for single character.

- 1) Select a random sample from each stratum.
- 2) Send a mail questionnaire to all the selected units in each stratum.
- 3) After the deadline is over, identify the non-respondents in each stratum.

Key words and phrases. Partial non-response, sampling scheme, estimation procedure, cost function, sample size, subsampling proportion.