

Assignment 2. Due Sept 25.

We have a population of size N which is very large and can be considered to be infinite. It consists of two groups of equal size. An opinion survey is to be conducted that results in a simple yes or no answer and the proportion of "yes" in the entire population is to be determined. A sample of size n is drawn and the proportion of yes among them is offered as an estimate. If in the entire population the proportion is $p = \frac{p_1+p_2}{2}$ where p_1, p_2 are the proportions in the two groups, exactly how much reduction in variance is obtained by selecting a sample of size $\frac{n}{2}$ from each group (rather than selecting n from the entire population) ?