

Sampling method used for research



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1. Single random sampling : a. Definition: Simple random sampling is the basic sampling technique where we select a group of subjects (a sample) for study from a larger group (a population). Each individual is chosen entirely by chance and each member of the population has an equal chance of being included in the sample. Every possible sample of a given size has the same chance of selection; i. e. each member of the population is equally likely to be chosen at any stage in the sampling process. b. Advantage: There are some advantages of using single random sampling : Firstly, collecting the sample easily since every member is given equal opportunities of being chosen. Another it requires minimum advance knowledge of the population. And the key factor of simple random sampling is its representativeness of the population. c. Disadvantage : However, sometimes random sampling method application impossible in practical terms. First, it is difficult to be able to have a complete list of all the objects in the target population. For example, when you want prospective study on the injuries caused by traffic accidents, we can not know how many emergency patients will be there day or during the time we gather data. Second, even with the full list of subjects it is sometimes difficult to randomly select a object. Suppose if we want to measure the satisfaction level of professional nurses in a hospital with 300 nurses that are working and the sample size is 120. It is unreasonable to draw or randomly selected one by one until the object is 120 Thirdly, we can not ensure the complete objectivity of the method. In general, here are two concepts that we should consider : the objects must be selected independently, and all subjects have equal chance of being selected. d.

Practical example : . Imagine you want to carry out a survey of 100 voters in a small town with a population of 1, 000 eligible voters. With a town this size,

there are " old-fashioned" ways to draw a sample. For example, we could write the names of all voters on a piece of paper, put all pieces of paper into a box and draw 100 tickets at random. You shake the box, draw a piece of paper and set it aside, shake again, draw another, set it aside, etc. until we had 100 slips of paper. These 100 form our sample. And this sample would be drawn through a simple random sampling procedure - at each draw, every name in the box had the same probability of being chosen. 2.

Stratified sampling : a. Definition: It is a sampling method in which the population is split into several categories that share common characteristics. Items are collected at random from each category, in proportion to the size of the category relative to the population. Stratified sampling may give more reliable results than pure random sampling because it ensures that all categories are fairly represented. b. Advantage : Ensures units from each main group are included and may therefore be more reliably representative. Should reduce the error due to sampling. c. Disadvantage : Selecting the sample is more complex and requires good population information. The estimates involve complex calculations. d. Practical example : In general the size of the sample in each stratum is taken in proportion to the size of the stratum. This is called proportional allocation. Suppose that in a company there are the following staff: * male, full time: 90 * male, part time: 18 * female, full time: 9 * female, part time: 63 * Total: 180 and we are asked to take a sample of 40 staff, stratified according to the above categories. The first step is to find the total number of staff (180) and calculate the percentage in each group. * % male, full time = $90 / 180 = 50\%$ * % male, part time = $18 / 180 = 10\%$ * % female, full time = $9 / 180 = 5\%$ * % female, part time = $63 / 180 = 35\%$ This tells us that of our sample of 40, * 50%

should be male, full time. * 10% should be male, part time. * 5% should be female, full time. * 35% should be female, part time. * 50% of 40 is 20. * 10% of 40 is 4. * 5% of 40 is 2. * 35% of 40 is 14. Another easy way without having to calculate the percentage is to multiply each group size by the sample size and divide by the total population size (size of entire staff): * male, full time = $90 \times (40 / 180) = 20$ * male, part time = $18 \times (40 / 180) = 4$ * female, full time = $9 \times (40 / 180) = 2$ * female, part time = $63 \times (40 / 180) = 14$

3. Cluster sampling : a. Definition: A random sampling plan in which the population is subdivided into groups called clusters so that there is small variability within clusters and large variability between clusters. b.

Advantage: Quicker, easier and cheaper than other forms of random sampling. Does not require complete population information. Useful for face-to-face interviews. Works best when each cluster can be regarded as a microcosm of the population. c. Disadvantages: Larger sampling error than other forms of random sampling. If clusters are not small it can become expensive. A larger sample size may be needed to compensate for greater sampling error d. Practical example : Let's say you want to conduct a study involving nurses in the United States. Instead of randomly selecting 10% of the nurses in every hospital in the country, you could randomly select 10% of the hospitals and take all of the nurses in those hospitals to be part of your sample. In a study of the opinions of homeless across a country, rather than study a few homeless people in all towns, a number of towns are selected and a significant number of homeless people are interviewed in each one.

For example, in a household survey, the people within a household have the same socioeconomic status, usually are of the same ethnic origin, hold many of the same beliefs and usually have the same dietary habits. People within a

block of houses usually have the same tendencies depending on the neighborhood. In statistical terms, there is a high positive correlation between attributes within the respondents in the same cluster. 4. Quota sampling: a. Definition: The aim is to obtain a sample that is representative of the population. The population is stratified by important variables and the required quota is obtained from each stratum. b. Advantages: | It is a quick way of obtaining a sample. | It can be fairly cheap. | If there is no sampling frame it may be the only way forward. | Additional information may improve the credibility of the results. c. Disadvantages : | Not random so stronger possibility of bias. | Good knowledge of population characteristics is essential. | Estimates of the sampling error and confidence limits probably can't be calculated. d. Practical example :