Probability Sampling and Randomization

Probability sampling is a sampling technique wherein the samples are gathered in a process that gives all the individuals in the population equal chances of being selected.

In this sampling technique, the researcher must guarantee that every individual has an equal opportunity for selection and this can be achieved if the researcher utilizes randomization.

The advantage of using a random sample is the absence of both systematic and sampling bias. If random selection was done properly, the sample is therefore representative of the entire population.

The effect of this is a minimal or absent systematic bias which is the difference between the results from the sample and the results from the population. Sampling bias is also eliminated since the subjects are randomly chosen.

Types of Probability Sampling

Simple Random Sampling

Simple random sampling [1] is the easiest form of probability sampling [2]. All the researcher needs to do is assure that all the members of the population are included in the list and then randomly select the desired number of subjects.

There are a lot of methods to do this. It can be as mechanical as picking strips of paper with names written on it from a hat while the researcher is blindfolded or it can be as easy as using a computer software to do the random selection for you.

Stratified Random Sampling

Stratified random sampling [3] is also known as proportional random sampling. This is a probability sampling technique wherein the subjects are initially grouped into different classifications such as age, socioeconomic status or gender.

Then, the researcher randomly selects the final list of subjects from the different strata. It is important to note that all the strata must have no overlaps.

Researchers usually use stratified random sampling if they want to study a particular subgroup within the population. It is also preferred over the simple random sampling because it warrants more precise statistical outcomes.

Systematic Random Sampling

Systematic random sampling [4] can be likened to an arithmetic progression wherein the difference between any two consecutive numbers is the same. Say for example you are in a clinic and you have 100 patients.

1. The first thing you do is pick an integer that is less than the total number of the population; this will be your first subject e.g. (3).
2. Select another integer which will be the number of individuals between subjects e.g. (5).
3. You subjects will be patients 3, 8, 13, 18, 23, and so on.

There is no clear advantage when using this technique.

Cluster Random Sampling

Cluster random sampling [5] is done when simple random sampling is almost impossible because of the size of the population. Just imagine doing a simple random sampling when the population in question is the entire population of Asia.

1. In cluster sampling, the research first identifies boundaries, in case of our example; it can be countries within Asia.
2. The researcher randomly selects a number of identified areas. It is important that all areas (countries) within the population be given equal chances of being selected.
3. The researcher can either include all the individuals within the selected areas or he can randomly select subjects from the identified areas.

Mixed/Multi-Stage Random Sampling

This probability sampling technique involves a combination of two or more sampling techniques enumerated above. In most of the complex researches done in the field or in the lab, it is not suited to use just a single type of probability sampling.

Most of the researches are done in different stages with each stage applying a different random sampling technique.

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Links
[1] https://explorable.com/simple-random-sampling
[2] http://www.socialresearchmethods.net/kb/sampprob.php
[3] https://explorable.com/stratified-sampling
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