**UNIT:III**

**Census & Sample Surveys**

In Statistics, the basis of all statistical calculations or interpretation lies in the collection of data. There are numerous methods of data collection. Both are suitable in different cases and the knowledge of these methods is important to understand when to apply which method.

These two methods are the Census method and Sampling method.

**Census Sampling**

Census method is the method of statistical enumeration where **all members of the population** are studied. A population refers to the set of all observations under concern. For example, if you want to carry out a survey to find out student’s feedback about the facilities of your school, all the students of your school would form a part of the ‘population’ for your study.

At a more realistic level, a country wants to maintain information and records about all households. It can collect this information by surveying *all* households in the country using the census method.

In our country, the Government conducts the **Census of India**every ten years. The Census appropriates information from households regarding their incomes, the earning members, the total number of children, members of the family, etc. This method must take into account all the units. It cannot leave out anyone in collecting data. Once collected, the Census of India reveals *demographic information* such as birth rates, death rates, total population, population growth rate of our country, etc. The last census was conducted in the year 2011, and due in 2021.

**Sampling Method**

Like we have studied, the population contains units with some similar characteristics on the basis of which they are grouped together for the study. In the case of the Census of India, for example, the common characteristic was that all units are Indian nationals. But it is not always practical to collect information from all the units of the population.

It is a time-consuming and costly method. Thus, an easy way out would be to collect information from some representative group from the population and then make observations accordingly. This representative group which contains some units from the whole population is called the **sample**.

The first most important step in selecting a sample is to determine the population. Once the population is identified, a sample must be selected. A good sample is one which is:

* Small in size.
* It provides adequate information about the whole population.
* It takes less time to collect and is less costly.

In the case of our previous example, you could choose students from your class to be the *representative sample* out of the population (all students in the school). However, there must be some rationale behind choosing the sample. If you think your class comprises a set of students who will give unbiased opinions/feedback or if you think your class contains students from different backgrounds and their responses would be relevant to your student, you must choose them as your sample. Otherwise, it is ideal to choose another sample which might be more relevant.

Again, realistically, the government wants estimates on the average income of the Indian household. It is difficult and time-consuming to study all households. The government can simply choose, say, 50 households from each state of the country and calculate the average of that to arrive at an *estimate*. This estimate is not necessarily the actual figure that would be arrived at if all units of the population underwent study. But, it approximately gives an idea of what the figure might look like.

**Different**

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| --- | --- | --- |
|  | **Census** | **Sample Survey** |
| Definition | A statistical method that studies all the units or members of a population. | A statistical method that studies only a representative group of the population, and not all its members. |
| Calculation | Total/Complete | Partial |
| Time involved | It is a time-consuming process. | It is a quicker process. |
| Cost involved | It is a costly method. | It is a relatively inexpensive method. |
| Accuracy | The results obtained are accurate as each member is surveyed. So, there is a negligible error. | The results are relatively inaccurate due to leaving out of items from the sample. The resulting error is large. |
| Reliability | Highly reliable | Low reliability |
| Error | Not present | The smaller the sample size, the larger the error. |
| Relevance | This method is suited for heterogeneous data. | This method is suited for homogeneous data. |

Sampling Design

**SAMPLE DESIGN**

A sample design is the framework, or road map, that serves as the basis for the selection of a survey sample and affects many other important aspects of a survey as well. In a broad context, survey researchers are interested in obtaining some type of information through a survey for some population, or universe, of interest. One must define a sampling frame that represents the population of interest, from which a sample is to be drawn. The sampling frame may be identical to the population, or it may be only part of it and is therefore subject to some under coverage, or it may have an indirect relationship to the population.

**Sample Design for Managerial Research**

In business research, companies must often generate samples of customers, clients, employees, and so forth to gather their opinions. Sample design is also a critical component of marketing research and employee research for many organizations. During sample design, firms must answer questions such as: – What is the relevant population, sampling frame, and sampling unit? – What is the appropriate margin of error that should be achieved? – How should sampling error and non-sampling error be assessed and balanced?

**STEPS IN SAMPLE DESIGN**

While developing a sampling design, the researcher must pay attention to the following points:

* **Type of universe:** The first step in developing any sample design is to clearly define the set of objects, technically called the Universe, to be studied. The universe can be finite or infinite. In finite universe the number of items is certain, but in case of an infinite universe the number of items is infinite, i.e., we cannot have any idea about the total number of items. The population of a city, the number of workers in a factory and the like are examples of finite universes, whereas the number of stars in the sky, listeners of a specific radio programme, throwing of a dice etc. are examples of infinite universes.
* **Sampling unit:** A decision has to be taken concerning a sampling unit before selecting sample. Sampling unit may be a geographical one such as state, district, village, etc., or a construction unit such as house, flat, etc., or it may be a social unit such as family, club, school, etc., or it may be an individual. The researcher will have to decide one or more of such units that he has to select for his study.
* **Source list:** It is also known as ‘sampling frame’ from which sample is to be drawn. It contains the names of all items of a universe (in case of finite universe only). If source list is not available, researcher has to prepare it. Such a list should be comprehensive, correct, reliable and appropriate. It is extremely important for the source list to be as representative of the population as possible.
* **Size of sample:** This refers to the number of items to be selected from the universe to constitute a sample. This a major problem before a researcher. The size of sample should neither be excessively large, nor too small. It should be optimum. An optimum sample is one which fulfills the requirements of efficiency, representativeness, reliability and flexibility. While deciding the size of sample, researcher must determine the desired precision as also an acceptable confidence level for the estimate. The size of population variance needs to be considered as in case of larger variance usually a bigger sample is needed. The size of population must be kept in view for this also limits the sample size. The parameters of interest in a research study must be kept in view, while deciding the size of the sample. Costs too dictate the size of sample that we can draw. As such, budgetary constraint must invariably be taken into consideration when we decide the sample size.
* **Parameters of interest:** In determining the sample design, one must consider the question of the specific population parameters which are of interest. For instance, we may be interested in estimating the proportion of persons with some characteristic in the population, or we may be interested in knowing some average or the other measure concerning the population. There may also be important sub-groups in the population about whom we would like to make estimates. All this has a strong impact upon the sample design we would accept.
* **Budgetary constraint:** Cost considerations, from practical point of view, have a major impact upon decisions relating to not only the size of the sample but also to the type of sample. This fact can even lead to the use of a non-probability sample.
* **Sampling procedure:**Finally, the researcher must decide the type of sample he will use i.e., he must decide about the technique to be used in selecting the items for the sample. In fact, this technique or procedure stands for the sample design itself. There are several sample designs (explained in the pages that follow) out of which the researcher must choose one for his study. Obviously, he must select that design which, for a given sample size and for a given cost, has a smaller sampling error.

# Types of Sampling Design

## ****Types of Samples****



**Types Of Sampling Design**

**Probability sampling (Representative samples)**

Probability samples are selected in such a way as to be representative of the population. They provide the most valid or credible results because they reflect the characteristics of the population from which they are selected (e.g., residents of a particular community, students at an elementary school, etc.). There are two types of probability samples: random and stratified.

**Random sample**

The term random has a very precise meaning. Each individual in the population of interest has an equal likelihood of selection. This is a very strict meaning — you can’t just collect responses on the street and have a random sample.

The assumption of an equal chance of selection means that sources such as a telephone book or voter registration lists are not adequate for providing a random sample of a community. In both these cases there will be a number of residents whose names are not listed. Telephone surveys get around this problem by random-digit dialling — but that assumes that everyone in the population has a telephone. The key to random selection is that there is no bias involved in the selection of the sample. Any variation between the sample characteristics and the population characteristics is only a matter of chance.

**Stratified sample**

A stratified sample is a mini-reproduction of the population. Before sampling, the population is divided into characteristics of importance for the research. For example, by gender, social class, education level, religion, etc. Then the population is randomly sampled within each category or stratum. If 38% of the population is college-educated, then 38% of the sample is randomly selected from the college-educated population.

Stratified samples are as good as or better than random samples, but they require fairly detailed advance knowledge of the population characteristics, and therefore are more difficult to construct.

**Non-probability samples (Non-representative samples)**

As they are not truly representative, non-probability samples are less desirable than probability samples. However, a researcher may not be able to obtain a random or stratified sample, or it may be too expensive. A researcher may not care about generalizing to a larger population. The validity of non-probability samples can be increased by trying to approximate random selection, and by eliminating as many sources of bias as possible.

**Quota sample**

The defining characteristic of a quota sample is that the researcher deliberately sets the proportions of levels or strata within the sample. This is generally done to insure the inclusion of a particular segment of the population. The proportions may or may not differ dramatically from the actual proportion in the population. The researcher sets a quota, independent of population characteristics.

Example: A researcher is interested in the attitudes of members of different religions towards the death penalty. In Iowa a random sample might miss Muslims (because there are not many in that state). To be sure of their inclusion, a researcher could set a quota of 3% Muslim for the sample. However, the sample will no longer be representative of the actual proportions in the population. This may limit generalizing to the state population. But the quota will guarantee that the views of Muslims are represented in the survey.

**Purposive sample**

A purposive sample is a non-representative subset of some larger population, and is constructed to serve a very specific need or purpose. A researcher may have a specific group in mind, such as high level business executives. It may not be possible to specify the population — they would not all be known, and access will be difficult. The researcher will attempt to zero in on the target group, interviewing whoever is available.

**Convenience sample**

A convenience sample is a matter of taking what you can get. It is an accidental sample. Although selection may be unguided, it probably is not random, using the correct definition of everyone in the population having an equal chance of being selected. Volunteers would constitute a convenience sample.

Non-probability samples are limited with regard to generalization. Because they do not truly represent a population, we cannot make valid inferences about the larger group from which they are drawn. Validity can be increased by approximating random selection as much as possible, and making every attempt to avoid introducing bias into sample selection.

# Probability Sampling

 [AKTUTHEINTACTONE](https://theintactone.com/author/aktutheintactone/)[4 MAR 2019](https://theintactone.com/2019/03/04/brm-u4-topic-7-probability-sampling/) [2 COMMENTS](https://theintactone.com/2019/03/04/brm-u4-topic-7-probability-sampling/#comments)

Probability Sampling is a sampling technique in which sample from a larger population are chosen using a method based on the theory of probability. For a participant to be considered as a probability sample, he/she must be selected using a random selection.

The most important requirement of probability sampling is that everyone in your population has a known and an equal chance of getting selected. For example, if you have a population of 100 people every person would have odds of 1 in 100 for getting selected. Probability sampling gives you the best chance to create a sample that is truly representative of the population.

Probability sampling uses statistical theory to select randomly, a small group of people (sample) from an existing large population and then predict that all their responses together will match the overall population.

**Probability Sampling Example**

Let us take an example to understand this sampling technique. The population of the US alone is 330 million, it is practically impossible to send a survey to every individual to gather information but you can use probability sampling to get data which is as good even if it is collected from a smaller population.

For example, consider hypothetically an organization has 500,000 employees sitting at different geographic locations. The organization wishes to make certain amendment in its human resource policy, but before they roll out the change they wish to know if the employees will be happy with the change or not. However, it’s a tedious task to reach out to all 500,000 employees. This is where probability sampling comes handy. A sample from the larger population i.e from 500,000 employees can be chosen. This sample will represent the population. A survey now can be deployed to the sample.

From the responses received, management will now be able to know whether employees in that organization are happy or not about the amendment.

#### ****Steps involved in Probability Sampling****

1. **Choose your population of interest carefully:** Carefully think and choose from the population, people you think whose opinions should be collected and then include them in the sample.
2. **Determine a suitable sample frame:** Your frame should include a sample from your population of interest and no one from outside in order to collect accurate data.
3. **Select your sample and start your survey:** It can sometimes be challenging to find the right sample and determine a suitable sample frame. Even if all factors are in your favor, there still might be unforeseen issues like cost factor, quality of respondents and quickness to respond. Getting a sample to respond to true probability survey might be difficult but not impossible.

But, in most cases, drawing a probability sample will save you time, money, and a lot of frustration. You probably can’t send surveys to everyone but you can always give everyone a chance to participate, this is what probability sample is all about.

**When to use Probability Sampling**

1. **When the sampling bias has to be reduced:** This sampling method is used when the bias has to be minimum. The selection of the sample largely determines the quality of the research’s inference. How researchers select their sample largely determines the quality of a researcher’s findings. Probability sampling leads to higher quality findings because it provides an unbiased representation of the population.
2. **When the population is usually diverse**: When your population size is large and diverse this sampling method is usually used extensively as probability sampling helps researchers create samples that fully represent the population. Say we want to find out how many people prefer medical tourism over getting treated in their own country, this sampling method will help pick samples from various socio-economic strata, background etc to represent the bigger population.
3. **To create an accurate sample:** Probability sampling help researchers create an accurate sample of their population. Researchers can use proven statistical methods to draw accurate sample size to obtained well-defined data.

#### ****Advantages****

1. **Its Cost-effective:** This process is both cost and time effective and a larger sample can also be chosen based on numbers assigned to the samples and then choosing random numbers from the bigger sample. Work here is done.
2. **It is simple and easy:** Probability sampling is an easy way of sampling as it does not involve a complicated process. It is quick and saves time. The time saved can thus be used to analyze the data and draw conclusions.
3. **It is non-technical:** This method of sampling doesn’t require any technical knowledge because of the simplicity with which this can be done. This method doesn’t require complex knowledge and it is not at all lengthy.

Types of Probability Sampling: Simple Random Sampling, Systematic Sampling, Stratified Random sampling, Area sampling, Cluster Sampling

**Types of Probability Sampling**

1. **Simple Random Sample**

Simple random sampling as the name suggests is a completely random method of selecting the sample. This sampling method is as easy as assigning numbers to the individuals (sample) and then randomly choosing from those numbers through an automated process. Finally, the numbers that are chosen are the members that are included in the sample.

There are two ways in which the samples are chosen in this method of sampling: Lottery system and using number generating software/ random number table. This sampling technique usually works around large population and has its fair share of advantages and disadvantages.

**Simple Random Sample Advantages**

Ease of use represents the biggest advantage of simple random sampling. Unlike more complicated sampling methods such as stratified random sampling and probability sampling, no need exists to divide the population into sub-populations or take any other additional steps before selecting members of the population at random.

A simple random sample is meant to be an unbiased representation of a group. It is considered a fair way to select a sample from a larger population, since every member of the population has an equal chance of getting selected.

**Simple Random Sample Disadvantages**

A sampling error can occur with a simple random sample if the sample does not end up accurately reflecting the population it is supposed to represent. For example, in our simple random sample of 25 employees, it would be possible to draw 25 men even if the population consisted of 125 women and 125 men. For this reason, simple random sampling is more commonly used when the researcher knows little about the population. If the researcher knew more, it would be better to use a different sampling technique, such as stratified random sampling, which helps to account for the differences within the population, such as age, race or gender. Other disadvantages include the fact that for sampling from large populations, the process can be time consuming and costly compared to other methods.

1. **Systematic Sample**

Systematic Sampling is when you choose every “nth” individual to be a part of the sample. For example, you can choose every 5th person to be in the sample. Systematic sampling is an extended implementation of the same old probability technique in which each member of the group is selected at regular periods to form a sample. There’s an equal opportunity for every member of a population to be selected using this sampling technique.

**Risks Associated With Systematic Sampling**

One risk that statisticians must consider when conducting systematic sampling involves how the list used with the sampling interval is organized. If the population placed on the list is organized in a cyclical pattern that matches the sampling interval, the selected sample may be biased. For example, a company’s human resources department wants to pick a sample of employees and ask how they feel about company policies. Employees are grouped in teams of 20, with each team headed by a manager. If the list used to pick the sample size is organized with teams clustered together, the statistician risks picking only managers (or no managers at all) depending on the sampling interval.

1. **Stratified Random Sample**

Stratified Random sampling involves a method where a larger population can be divided into smaller groups that usually don’t overlap but represent the entire population together. While sampling these groups can be organized and then draw a sample from each group separately.

A common method is to arrange or classify by sex, age, ethnicity and similar ways. Splitting subjects into mutually exclusive groups and then using simple random sampling to choose members from groups.

Members in each of these groups should be distinct so that every member of all groups get equal opportunity to be selected using simple probability. This sampling method is also called “random quota sampling.

**Advantages of Stratified Random Sampling**

The main advantage of stratified random sampling is that it captures key population characteristics in the sample. Similar to a weighted average, this method of sampling produces characteristics in the sample that are proportional to the overall population. Stratified random sampling works well for populations with a variety of attributes but is otherwise ineffective if subgroups cannot be formed.

Stratification gives a smaller error in estimation and greater precision than the simple random sampling method. The greater the differences between the strata, the greater the gain in precision.

1. **Area Sampling**

Area sampling is a method of sampling used when no complete frame of reference is available. The total area under investigation is divided into small sub-areas which are sampled at random or according to a restricted process (stratification of sampling). Each of the chosen sub-areas is then fully inspected and enumerated, and may form the basis for further sampling if desired.

**Application of Area sampling**

The basic idea of area sampling is both simple and powerful. It enjoys wide usage in situations where very high quality data are wanted but for which no list of universe items exists. For instance, many governmental agencies (e.g. Bureau of Labor Statistics) use area sampling.

However, the practical execution of a large scale area sample is highly complex. Typically an area sampling is conducted in multiple stages, with successively smaller area clusters being sub-sampled at each stage.

**Example:** A national sample of households is often constructed in a series of steps like this:

(i) Create geographic strata, each consisting of a group of counties in more or less close proximity. Fifty or more such strata, containing all of the roughly 3,000 US counties, are commonly used.

(ii) Within each geographic stratum, choose a probability sample of one or more counties (or groups of counties such as metropolitan areas).

(iii) Within each sample county (or group of counties), choose a probability sample of places (cities, towns, etc).

(iv) Within each sample place, select a probability sample of area segments (blocks in cities, area with identifiable boundaries in other places, etc)

(v) Finally, within sample segments choose a probability sample of households.

1. **Cluster Sampling**

Cluster sampling is a way to randomly select participants when they are geographically spread out. For example, if you wanted to choose 100 participants from the entire population of the U.S., it is likely impossible to get a complete list of everyone. Instead, the researcher randomly selects areas (i.e. cities or counties) and randomly selects from within those boundaries.

Cluster sampling usually analyzes a particular population in which the sample consists of more than a few elements, for example, city, family, university etc. The clusters are then selected by dividing the greater population into various smaller sections.

**Cluster Sampling: Steps**

Some steps and tips to use cluster sampling for market research, are:-

* **Sample:** Decide the target audience and also the size of the sample.
* **Create and evaluate sampling frames:** Create a sampling frame by using either an existing frame or creating a new one for the target audience. Evaluate frames on the basis of coverage and clustering and make adjustments accordingly. These groups will be varied considering the population which can be exclusive and comprehensive. Members of a sample are selected individually.
* **Determine groups:** Determine the number of groups by including the same average members in each group. Make sure each of these groups are distinct from one another.
* **Select clusters:** Choose clusters randomly for sampling.
* **Geographic segmentation:** Geographic segmentation is the most commonly used cluster sample.
* **Sub-types:** Cluster sampling is bifurcated into one-stage and multi-stage subtypes on the basis of the number of steps followed by researchers to form clusters.

**Cluster Sampling Methods with Examples**

There are two ways to classify cluster sampling. The first way is based on the number of stages followed to obtain the cluster sample and the second way is the representation of the groups in the entire cluster.

The first classification is the most used in cluster sampling. In most cases, sampling by clusters happens over multiple stages. A stage is considered to be the steps taken to get to a desired sample and cluster sampling is divided into single-stage, two-stage, and multiple stages.

**(I) Single Stage Cluster Sampling:** As the name suggests, sampling will be done just once. An example of Single Stage Cluster Sampling –An NGO wants to create a sample of girls across 5 neighboring towns to provide education. Using single-stage cluster sampling, the NGO can randomly select towns (clusters) to form a sample and extend help to the girls deprived of education in those towns.

**(II) Two-Stage Cluster Sampling: A** sample created using two-stages is always better than a sample created using a single stage because more filtered elements can be selected which can lead to improved results from the sample. In two-stage cluster sampling, instead of selecting all the elements of a cluster, only a handful of members are selected from each cluster by implementing systematic or simple random sampling. An example of Two-Stage Cluster Sampling –A business owner is inclined towards exploring the statistical performance of her plants which are spread across various parts of the U.S. Considering the number of plants, number of employees per plant and work done from each plant, single-stage sampling would be time and cost consuming. This is when she decides to conduct two-stage sampling. The owner creates samples of employees belonging to different plants to form clusters and then divides it into the size or operation status of the plant. A two-level cluster sampling was formed on which other clustering techniques like simple random sampling were applied to proceed with the calculations.

**(III) Multiple Stage Cluster Sampling**: For effective research to be conducted across multiple geographies, one needs to form complicated clusters that can be achieved only using multiple-stage cluster sampling technique. Steps of listing and sampling will be used in this sampling method. An example of Multiple Stage Cluster Sampling –Geographic cluster sampling is one of the most extensively implemented cluster sampling technique. If an organization intends to conduct a survey to analyze the performance of smartphones across Germany. They can divide the entire country’s population into cities (clusters) and further select cities with the highest population and also filter those using mobile devices.

**Cluster Sampling Advantages**

There are multiple advantages of using cluster sampling, they are:-

**(I) Consumes less time and cost:**Sampling of geographically divided groups require less work, time and cost. It’s a highly economical method to observe clusters instead of randomly doing it throughout a particular region by allocating a limited number of resources to those selected clusters.

**(II) Convenient access:** Large samples can be chosen with this sampling technique and that’ll increase accessibility to various clusters.

**(III) Least loss in accuracy of data:** Since there can be large samples in each cluster, loss of accuracy in information per individual can be compensated.

**(IV) Ease of implementation:** Since cluster sampling facilitates information from various areas and groups, it can be easily implemented in practical situations in comparison to other probability sampling methods such as simple random sampling, systematic sampling, and stratified sampling or non-probability sampling methods such as convenience sampling.

In comparison to simple random sampling, cluster sampling can be effective in deciding the characteristics of a group such as population and it can also be implemented without having a sampling frame for all the elements for the entire population.

**Non Probability Sampling**

**N**on-probability sampling is a sampling technique in which the researcher selects samples based on the subjective judgment of the researcher rather than random selection.

In non-probability sampling, not all members of the population have a chance of participating in the study unlike probability sampling, where each member of the population has a known chance of being selected.

Non-probability sampling is most useful for exploratory studies like pilot survey (a survey that is deployed to a smaller sample compared to pre-determined sample size). Non-probability sampling is used in studies where it is not possible to draw random probability sampling due to time or cost considerations.

Non-probability sampling is a less stringent method, this sampling method depends heavily on the expertise of the researchers. Non-probability sampling is carried out by methods of observation and is widely used in qualitative research.

**Advantages of non-probability sampling**

**(i)** Non-probability sampling is a more conducive and practical method for researchers deploying survey in the real world. Although statisticians prefer probability sampling because it yields data in the form of numbers. However, if done correctly, non-probability sampling can yield similar if not the same quality of results.

**(ii)** Getting responses using non-probability sampling is faster and more cost-effective as compared to probability sampling because sample is known to researcher, they are motivated to respond quickly as compared to people who are randomly selected.

**Disadvantages of non-probability sampling**

(i) In non-probability sampling, researcher needs to think through potential reasons for biases.  It is important to have a sample that represents closely the population.

(ii) While choosing a sample in non-probability sampling, researchers need to be careful about recruits distorting data. At the end of the day, research is carried out to obtain meaningful insights and useful data.

**When to use non-probability sampling?**

* This type of sampling is used to indicate if a particular trait or characteristic exists in a population.
* This sampling technique is widely used when researchers aim at conducting qualitative research, pilot studies or exploratory research.
* Non-probability sampling is used when researchers have limited time to conduct researcher or have budget constraints.
* Non-probability sampling is conducted to observe if a particular issue needs in-depth analysis.

**Types of Non-Probability Sampling: Judgmental or Purposive Sampling, Convenience Sampling, Quota Sampling, Snowball Sampling, Consecutive Sampling**

1. **JUDGMENT OR PURPOSIVE SAMPLING**

In judgmental sampling, the samples are selected based purely on researcher’s knowledge and credibility. In other words, researchers choose only those who he feels are a right fit (with respect to attributes and representation of a population) to participate in research study.

This is not a scientific method of sampling and the downside to this sampling technique is that the results can be influenced by the preconceived notions of a researcher. Thus, there is a high amount of ambiguity involved in this research technique.

For example, this type of sampling method can be used in pilot studies.

1. **CONVENIENCE SAMPLING**

Convenience sampling is a non-probability sampling technique where samples are selected from the population only because they are conveniently available to researcher. These samples are selected only because they are easy to recruit and researcher did not consider selecting sample that represents the entire population.

Ideally, in research, it is good to test sample that represents the population. But, in some research, the population is too large to test and consider the entire population. This is one of the reasons, why researchers rely on convenience sampling, which is the most common non-probability sampling technique, because of its speed, cost-effectiveness, and ease of availability of the sample.

An example of convenience sampling would be using student volunteers known to researcher. Researcher can send the survey to students and they would act as sample in this situation.

1. **Quota Sampling**

Hypothetically consider, a researcher wants to study the career goals of male and female employees in an organization. There are 500 employees in the organization. These 500 employees are known as population. In order to understand better about a population, researcher will need only a sample, not the entire population. Further, researcher is interested in particular strata within the population. Here is where quota sampling helps in dividing the population into strata or groups.

For studying the career goals of 500 employees,  technically the sample selected should have proportionate numbers of males and females. Which means there should be 250 males and 250 females. Since, this is unlikely, the groups or strata is selected using quota sampling.

1. **Snowball Sampling**

Snowball sampling helps researchers find sample when they are difficult to locate.  Researchers use this technique when the sample size is small and not easily available. This sampling system works like the referral program. Once the researchers find suitable subjects, they are asked for assistance to seek similar subjects to form a considerably good size sample.

For example, this type of sampling can be used to conduct research involving a particular illness in patients or a rare disease. Researchers can seek help from subjects to refer other subjects suffering from the same ailment to form a subjective sample to carry out the study.

1. **Consecutive Sampling**

This non-probability sampling technique is very similar to convenience sampling, with a slight variation. Here, the researcher picks a single person or a group of sample, conducts research over a period of time, analyzes the results and then moves on to another subject or group of subject if needed.

Consecutive sampling gives the researcher a chance to work with many subjects and fine tune his/her research by collecting results that have vital insights.