**SAMPLING TECHNIQUES**

A sample is a small group selected from the accessible population under study.

**NEED OF SAMPLING:**

1. It may not always be possible to examine or study an entire population
2. It may not require going for census.
3. In many cases it is possible to obtain accurate results that can be used to generalize on a population.
4. Sampling is cheaper (cost friendly) –time, money, resources etc.

**SAMPLING TECHNIQUES**

Sampling techniques can mainly be classified into:

1. Probability Sampling
2. Non-probability Sampling
3. **PROBABILITY SAMPLING**

It is also identified as random sampling. It is the sampling technique in which all the units/cases in a population have equal chances of being selected to form a sample.

**BASIC TERMS IN SAMPLING**

**N -** Number of cases/units in the sampling frame

**n** -Number of cases/units in the sampling

**N C n -** number of combinations / subsets of n from N

**f** - Sampling fraction

**k -** Interval size

In probability/random sampling we have:

* Simple random sampling
* Stratified random sampling
* Systematic random sampling
* Cluster (area) random sampling
* Multi stage sampling

SIMPLE RANDOM SAMPLING

It’s the simplest form of random sampling. It involves identifying the desired sample size then we number the units in the sample frame then we randomly select the desired sample size. In this case all the units have equal chances of being picked into a sample.

Example:

1. Having the sample labels on small pieces of paper that are then folded and shaken then the person picks the units randomly. This is not efficient as it depends on how thorough the papers are shaken and how random the papers are picked.
2. Balls labeled with population units are put in a shaking machine that brings one out periodically. This is tedious and expensive as shaking machines may not even be available.
3. Using computer applications is more reliable. Microsoft Excel is one of them. One can enter the units in a population onto one column in excel then select the next column and enter the function of **=RAND().** This puts random numbers between 0 and 9 for each unit. Then sort the table out in a certain order and then select your desired sample size.

**Merits of Random Sampling:**

1. It is objective (bias)
2. No prior knowledge on the sample is required.
3. It is a true representation of the population
4. It is simple and practicable.
5. It is cheap in terms of money, time and labor.

**Demerits:**

* It requires the complete list of the population but such up to date information may not be available.
* It is time consuming as the sample units may be widely scattered..
* If it is small, the sample may not be representative of the population.

This sampling method is not efficient as it ignores the possibility of variability in a population (heterogeneity in a population).

STRATIFIED RANDOM SAMPLING

It is also called proportional or quota sampling. It recognizes heterogeneity and homogeneity within a population or units in a sampling frame. Thus the population is divided into sub groups that are homogeneous. You make a population of every subgroup and on each of these, simple random sampling is carried out.

Hence **N1 + N2 + N3+…+Ni = N**

It is very representative, especially when we have minority groups within the population or sampling frame. When the sampling fraction is the same in all sub-groups in the sampling frame it is called Proportionate stratified random sampling and when it varies it is called disproportionate stratified random sampling. The variability within a sub-group is smaller compared to the variability in a simple random sampling sample.

**Example:**  Doing sampling of people who happen to be multi-cultural. We need to divide the population into sub-groups based on race. From each group we conduct simple random sampling.

Merits:

1. It has high chances of being representative of the sample.
2. No significant group is left unrepresented.

Demerits:

1. It is very difficult to divide the population into homogeneous subgroups / subsets.
2. If the sub groups overlap then the samples may provide inaccurate information.

SYSTEMATIC RANDOM SAMPLING

This is a probabilistic sampling method in which one numbers the entire population on a sampling frame from 1 to N then calculate the interval size. Pick one integer between 1 and the interval size (k). Then pick every Kth unit/case to finally form a sample.

**Example:** sampling of farm produce like pineapples by a juice making company.

**Merits:**

1. Easy and cheap to use.

CLUSTER (AREA) RANDOM SAMPLING

Mainly focuses on distance and geography. In this probability sampling method we divide the population into clusters (mainly along geographic boundaries. Then you randomly sample the clusters and finally measure all the units in the sampled clusters.

**Example:** When sampling an entire province it may be challenging, therefore we divide the province into clusters. Then sample the clusters so you end up with a number of districts then measure every unit within the sampled districts.

**Merits:**

1. It is cheap and economical
2. Easier and more practicable

**Demerits:**

1. It is dependent on the sample size

MULTI STAGE SAMPLING

This probability sampling method makes a combination of the other probability sampling methods. The multi stage means that the sampling is done at various levels where in each level; one probability sampling method is used.

**Example:** When doing research on academics in a province we first divide the province into clusters. On each cluster we conduct stratified random sampling in which we identify schools. In each stratum we carry out simple random sampling.

**Merits:**

1. It is flexible

**Demerits:**

1. It involves a considerable amount of listings

**NON PROBABILITY SAMPLING**

In this sampling technique, the units of the population don’t have equal chances of being selected. It involves the application of some form of bias. Non probability sampling can be categorized into two main types:

1. Accidental, Haphazard or convenience sampling
2. Purposive sampling

**ACCIDENTAL, HAPHAZARD, OPPORTUNISTIC OR CONVENIENCE SAMPLING**

In this sampling method the sampling is done based on the context of the researcher i.e. the convenience of the sampler, an opportunity etc.

It can be used when:

1. The population is not defined
2. Sample is not clear
3. A complete source list is not available

**Merits:**

1. It is economical and time saving.
2. It is flexible

**Demerits:**

1. It is mainly biased
2. It has possibilities of being subjective.

**PURPOSIVE SAMPLING**

This entails sampling with a purpose in mind. This sampling has predefined groups. E.g. gender, political party affiliation etc. It however, risks overweighing the opinion of a particular sub-group. The categories of purposive sampling are:

1. Modal instance sampling
2. Expert sampling
3. Quota sampling
4. Heterogeneity sampling
5. Snowball sampling

Merits:

1. It is economical and time saving.
2. It ensures collection of relevant and representative samples.
3. It is useful when certain units are important to be included to fulfill the requirement of investigation.
4. It is easy to carry out

Demerits:

1. Considerable prior knowledge of population is necessary which in most cases is not possible.
2. It has high chances of being biased.
3. **MODAL INSTANCE SAMPLING**

Statistically speaking, the mode is the most recurring value in a distribution. In sampling this method involves sampling the most frequent or most recurring case.

1. **EXPERT SAMPLING**

This involves having people with the experience or the knowledge on a given area, constituting a sample (i.e. ‘A panel of experts’) this sampling seeks to find expert information on an area. It may also be used to measure the validity of another sampling method.

1. **QUOTA SAMPLING**

There are two main types of quota sampling:

* Proportional quota sampling
* Non proportional quota sampling

**Proportional quota sampling:** It involves representing the major characteristics of a population by sampling a proportional amount of each characteristic. However, one has to clearly identify the characteristics they are going to base their quota e.g. gender, age, and religion.

**Non - Proportional quota sampling:** This sampling method does not consider proportional samples but rather the researcher establishes the minimum number of desired sampling units in each category. I t puts more emphasis on contents not numbers. (wants the data to be representative of the population (all the small groups within a population be represented)

1. **HETEROGENEITY SAMPLING**

It is also called sampling for diversity. It also does not focus on numbers/people but the ideas/contents. It seeks opinions from all the existing parties of a population. E.g. researching on the challenges of Nairobi people, one wants as many ideas as possible.

1. **SNOWBALL SAMPLING**

In this case the sampler starts by identifying a person who meets the criterion established for the sample units. The sampler will then ask this person to recommend someone who meets the same criteria. Therefore, it is a sampling method in which a sampling unit leads to other sampling units and so on till the sample is complete.