

Chapter 4

Sampling Techniques and sample size

- A sample is a **representative** of the population under study.
- Sampling is the process of selecting a number of study units from a defined study population.
- Often research focuses on a large population that, for practical reasons, it is only possible to include some of its members in the investigation. You then have to draw a sample from the total population.
- In such cases you must consider the following questions:
 - ❖ What is the study population you are interested in from which we want to draw a sample?
 - ❖ How many subjects do you need in your sample?
 - ❖ How will these subjects be selected?
- The study population has to be clearly defined.
- Otherwise you cannot do the sampling. Apart **from persons, a study population may consist of villages, institutions, plants, animals, records, etc.**

- There are **two main categories of sampling methods: probability and non-probability.**
- you can employ a variety of sampling methods, **either individually or in combination.**

Probability sampling techniques

- In order to **avoid selection bias** in your study, it is important for to guarantee that each member of your target population has an equal opportunity for selection.
- In order to achieve this, your participants must be selected at random – in other words, the selection of your sample must be based on the **principle of randomization or chance, and your sampling method must be probability sampling** (also referred to as representative sampling).

Simple random sample

- The guiding principle behind this technique is that each element must have **equal and non-zero chance** of being selected.
- To select a simple random sample, you need a table of random numbers (statistics books include such tables; computer statistical packages, such as SPSS, are also able to generate random numbers).

Systematic sampling

- This technique begins with selecting one element at random in the sampling frame as the starting point, however, from this point onward, the rest of the sample is selected systematically by applying a predetermined interval.

- The steps you need to follow are:
 1. Number the units in the population from 1 to N
 2. decide on the n (sample size) that you want
 3. $k = N/n$ = the interval size
 4. randomly select an integer between 1 to k
 5. then take every kth unit

Stratified sampling

- It begins with **the identification of some variable**, which may be related indirectly to the research question and could act as a cofounder (such as **geography, age, income, ethnicity, or gender**).
- This variable is then **used to divide the sampling frame into mutually exclusive strata** or subgroups.
- Once the sampling frame is arranged by strata, the sample is selected from each stratum using **simple random sampling or systematic sampling techniques**.
- It is important that the sample selected within each stratum reflects proportionately the population proportions; thus, you can employ **proportionate stratified sampling**.

Multistage sampling

- It is used when an appropriate sampling frame does not exist or cannot be obtained. Multistage cluster sampling uses a collection of preexisting units or clusters to “stand in” for a sampling frame. **Using all the sample elements in all the selected clusters may be expensive or not even necessary**

e.g. 1st stage: Kifle Ketema, 2nd stage: kebele, 3rd stage: Blocks—4th stage: residences

Non-probability sampling

- Probability sampling is often **quite difficult** to achieve.
- Non-probability sampling is **defined** as ‘sampling where it is **not possible to specify the probability** that any person or other unit on which the survey is based will be included in the sample’ (Smith, 1983); it is **frequently used in qualitative studies** (Robson, 2002), providing researchers with the opportunity to **‘select samples purposively’** and enabling them to reach ‘difficult-to-identify members’ of the population (Saunders *et al.*, 2003: 178).

- With non-probability sampling it is unlikely that valid inferences can be made regarding the entire population, as the sample selected is not representative (all members of the population do not have an equal chance of being selected).
- Five non-probability sampling techniques have evolved:
 1. convenience sampling,
 2. judgmental sampling,
 3. quota sampling,
 4. snowball sampling and
 5. self-selection sampling.

Convenience sampling

- With convenience sampling (sometimes referred to as **haphazard or accidental sampling**), **participants are selected because of their convenient accessibility.**
- **If, for instance, you intend to interview tourists** in a given tourism destination, you may approach them in some of the major attractions in this destination.
- Of course, you will visit several different types of attractions (theme parks, historic sites, museums, etc.), and perhaps try to go at different times of the day and/or week to reduce bias, but in effect, the interviews that you conduct will be determined by convenience and not by randomness.