Research Methods

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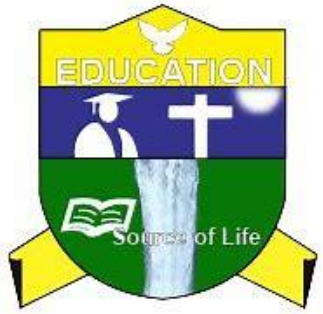
SAMPLING DESIGN

Outline

- Sampling design
- Sampling design types/ techniques/methods



Sampling Design

INTRODUCTION

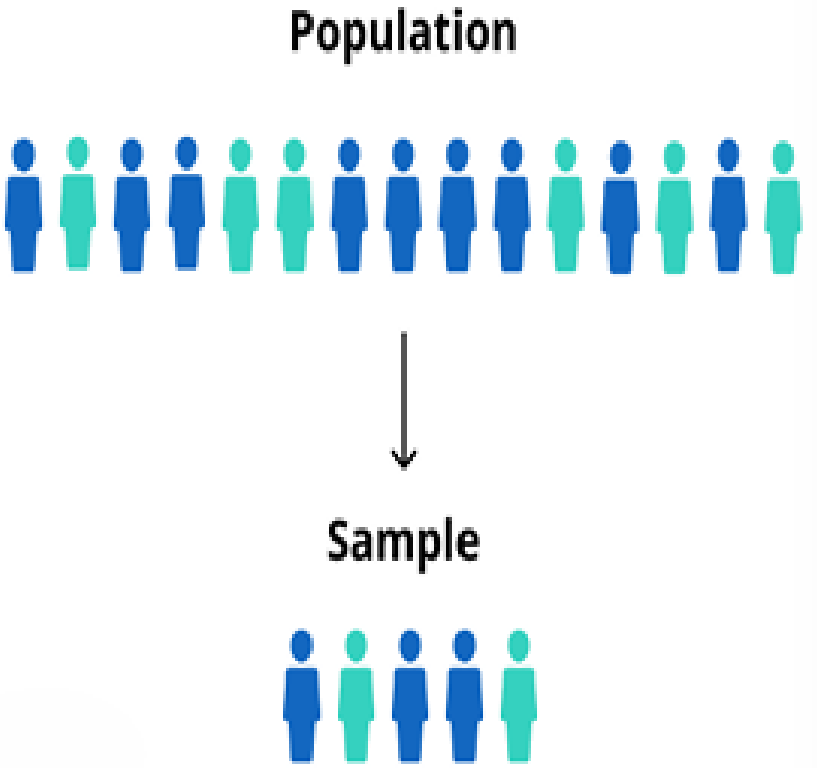
- When conducting research about a group of people, it is rarely possible to collect data from every person in that group; instead, you select a **sample**.
- **A sample design** is a definite plan for obtaining a sample from a given population. Here it involves preparing a sample design during your research study.

Sampling Design

- **Population** is the entire group of individuals or entities that a researcher is interested in studying. This group includes all subjects that share a set of common characteristics relevant to the research objective or question.
- **Example: if a study aims to investigate the health outcomes of adults living in a specific region, the population would encompass all adults living in that region.**

Sampling Design

- **Sample** is the specific group of individuals that you will collect data from.
- **Sample**: Group of individuals who will participate in research. Therefore the selected respondents constitute what is technically called a ‘sample’.
- To draw valid conclusions from your results, you should carefully decide how you will select a sample that is representative of the group as a whole.



Sampling Design

- Sample size- refers to the number of observations or participants included in a study.
- The sample size is critical because it can impact the reliability and validity of the study's findings.
- The larger the sample size, the more accurately and confidently you can conclude the whole population.

Sampling Design

- Sample size- refers to the number of observations or participants included in a study.
- To determine the sample size required for your study you can use this formula

$$\text{Sample size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N}\right)}$$

Sampling Design

- **Population Size (N):** This is the total number of people or items that you want to study.
- **Margin of Error (e):** This indicates the maximum amount of error you're willing to tolerate. If you want a 95% confidence level, and you're okay with a 5% margin of error, you'd use 0.05 for e.
- **Sample Proportion (p):** This represents the proportion of the population that you expect to have a particular characteristic. If you don't know this proportion, it's common to use 0.5, as it provides a conservative estimate.
- **Z-score (z):** The z-score corresponds to the confidence level you want for your study. For example:
  - 90% confidence level: z ≈ 1.645
  - 95% confidence level: z ≈ 1.96
  - 99% confidence level: z ≈ 2.576

These scores are already determined based on standard statistical tables

$$\text{Sample size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N}\right)}$$

Sampling Design

Confidence Level	Z-Score
80%	1.28
85%	1.44
90%	1.645
95%	1.96
99%	2.576
99.9%	3.291

Sampling Design

- Remember, both the confidence level and margin of error will impact your sample size
- The higher the confidence levels and smaller margins or error generally require larger sample sizes.
- A good sample size will often depend on your study's objective and the population you're surveying.

Types of Sampling Design

- Sample designs are basically of two types

1. Probability sampling

2. Non-probability sampling

Types of Sampling Design

- Sample designs are basically of two types

1. Probability sampling

- Probability sampling is also known as '**random sampling**' or '**chance sampling**' whereby every member of the population has a chance of being selected or be included in the sample.
- If you want to produce results that are representative of the whole population, you need to use a probability sampling technique
- You can not select or include the same member in a sample twice

Types of Sampling Design

- Sample designs are basically of two types

2. Non-probability sampling

- Non-probability sampling is also known as ‘deliberate sampling’, ‘purposive sampling’, and ‘judgment sampling’.

- **Non-probability sampling** is a sampling method where **not all members of the population have a known or equal chance of being selected**.

Differences between Probability and Non-Probability

	Probability Sampling Methods	Non-Probability Sampling Methods
Definition	Probability Sampling is a sampling technique in which samples from a larger population are chosen using a method based on the theory of probability	Non-probability sampling is a sampling technique in which the researcher selects samples based on the researcher's subjective judgment rather than random selection
Alternatively Known as	Random sampling method	Non-random sampling method

Differences between Probability and Non-Probability

Population selection	The population is selected randomly	The population is selected arbitrarily
Nature	The research is conclusive	The research is exploratory
Sample	Since there is a method for deciding the sample, the population demographics are conclusively represented	Since the sampling method is arbitrary, the population demographics representation is almost always skewed

Differences between Probability and Non-Probability

Time Taken	**Takes longer to conduct since the research design defines the *selection parameters* before the market research study begins**	**This type of sampling method is quick since neither the sample or selection criteria of the sample are undefined**
Results	This type of sampling is entirely unbiased and hence the results are unbiased too and conclusive	This type of sampling is entirely biased and hence the results are biased too, rendering the research speculative

THANK YOU