

# **SAMPLING PLAN & SURVEY DESIGN**

## **Sampling**

Sampling is a process used in statistical analysis in which a predetermined number of observations are taken from a larger population. The methodology used to sample from a larger population depends on the type of analysis being performed. To get a representative sample, the sample must be drawn randomly and encompass the whole population. For example, a lottery system could be used to determine the average age of students in a university by sampling 10% of the student body.

## **Sampling Plan**

A sampling plan is a term widely used in research studies that provide an outline on the basis of which research is conducted. It tells which category is to be surveyed about should be the sample size and how the replacements should be chosen out of the population;

There are three major units;

- ✓ Sampling unit (choose the population)
- ✓ Sampling size (# of member in the population)
- ✓ Sampling procedure (Method to select the member of population)

There are two types of sampling to select the sample

- Probability Sampling
- Non-Probability Sampling

### **❖ Probability Sampling**

When we use probability sampling, randomness will be built into the sampling designs so that properties of the estimators can be assessed probabilistically. There are main types of probability sampling:

1:- Sample Random Sampling

2:- Stratified Random Sampling

3:-Systematic Random Sampling

4:-Cluster Random Sampling

## ❖ **Non-probability Sampling**

A sample of participants or cases does not need to be representative, or random, but a clear rationale is needed for the inclusion of some cases or individuals rather than others.

1:- Convenience Sampling

2:- Purposive Sampling

3:- Snow-Ball Sampling

4:- Quota Sampling

## ❖ **Probability Sampling**

### **Simple Random sampling:**

In data collection, every individual observation has equal probability to be selected into a sample. In random sampling, there should be no pattern when drawing a sample.

### **Stratified simple random sampling:**

In stratified simple random sampling, a proportion from strata of the population is selected using simple random sampling. For example, a fixed proportion is taken from every class from a school.

### **Systematic sampling:**

Systematic sampling is where every  $n$ th case after a random start is selected. For example if surveying a sample of consumers, every fifth consumer may be selected from your sample. The advantage of this sampling technique is its simplicity.

### **Cluster sampling:**

Cluster sampling occurs when a random sample is drawn from certain aggregational geographical groups.

### **Multistage stratified random sampling:**

In multistage stratified random sampling, a proportion of strata is selected from a homogeneous group using simple random sampling. For example, from the  $n$ th class and  $n$ th stream, a sample is drawn called the multistage stratified random sampling.

## **Multistage cluster sampling:**

Multistage cluster sampling occurs when a researcher draws a random sample from the smaller unit of an aggregational group.

### **❖ NON-PROBABILITY SAMPLING**

Non-probability sampling is a type of sampling where each member of the population does not have known probability of being selected in the sample.

The types of non-probability sampling are explained as below:

#### **➤ Convenience Sampling**

It is a type of sampling where the members of the sample are selected on the basis of their convenient accessibility. Only those members are selected which are easily accessible to the researcher. For example, a research may visit a college or a university and get the questionnaires filled in by volunteer students.

#### **➤ Purposive Sampling**

It is a type of sampling where the members for a sample are selected according to the purpose of the study. For example, if a researcher wants to study the impact of drugs abuse on health. Only the drug addicts can be the best respondents for this study.

#### **➤ Snow-Ball Sampling**

Snow-ball sampling is also called chain sampling. It is a type of sampling where one respondent identifies other respondents (from his friends or relatives) the study. Snow-ball sampling is adopted in situations where it is difficult to identify the members of the sample. For example, a researcher wants to study 'problems faced by migrants in an area.

#### **➤ Quota Sampling**

In this type of sampling, the members are selected according to some specific characteristics chosen by the researcher. These specific characteristics serve as a quota for selection of members of the sample. Hence, the members are selected on the basis of these specific characteristics such as age, sex, religion, profession, ethnicity, interest and so on.

# Survey Design

Survey Design is the process of creating surveys with the goal of receiving maximum insights from survey research.

Survey research is an efficient way of gathering data to help answer a question. The challenge is developing reliable & valid measures & sampling representative data.

Before designing a survey, develop a research proposal which clearly explains the:

1. Research purpose
2. Research questions
3. Hypotheses
4. Research design:
5. Sampling method
6. Target construct
  1. independent variables
  2. dependent variables

Have the research proposal peer reviewed and modify as appropriate. Before designing a survey, it is helpful, and generally recommended, to clearly establish a research proposal and to get this proposal peer-reviewed. Investment in developing the proposal is generally returned many-fold.

The seven Ps apply to survey design: Prior preparation and planning prevents piss-poor performance.

Poor research results and conclusions emerge from poor data, which is often due to poor **survey design**. Hence, a well-conducted survey research project should exhibit:

- clarity in the project's purposes
- careful development of well-worded questions with appropriate response formats and/or
- A well designed and implemented sampling method.

## Initial draft survey

1. Purpose of research
2. Within each section, brainstorm ways data about topic/question could be obtained a reliable and valid measure of the target constructs.
3. For each consider, brainstorm
4. Add an informed consent statement, a coversheet, and an instructions page
5. Get the draft survey critically reviewed by others, then redraft etc.
6. Get assistance with high quality word-processing skills (if you don't have them) to tweak the essay so that it looks professional
7. Pre-test the survey
8. Pilot test the survey
9. Use the survey in a major study

## **Survey structure**

1. Cover letter
2. Informed consent
3. Ethics complaints
4. Sections containing survey questions
  1. Personal details / demographics
  2. One section per major topic
5. Debrief information

## **Types of surveys**

Types of surveys are:

1. Hard copy
2. Electronic
3. Face to face
4. Telephone

## **Types of questions**

It is surprisingly difficult to develop a "good" survey question or item. Consider each of the following aspects of survey questions, their pros and cons, and with examples:

1. Objective vs. subjective
2. Close-ended vs. open-ended
3. Leading and loaded questions
4. Positive-, negative-, and double-negative-wording

## **Types of data**

Surveys can be used to collect:

1. Quantitative
2. Qualitative data.

## **Response formats**

It is important to understand the implications of response formats on levels of measurement in survey design and quantitative data analysis.

Some commonly used response formats include:

- Dichotomous: e.g., Yes or No
- Multi-chotomous: e.g., Yes, No, or Maybe
- Multiple response: e.g., Tick all that apply
- Likert scale: Equally-spaced intervals, usually 3 to 9 intervals
- Graphical rating: Can mark any point on a continuous scale
- Ranking: Compare items to each other by placing them in order of descending preference

- Semantic differential: Put two words at opposite ends of a scale with interval marks
- Idiographic: Use symbols/pictures instead of words and numbers

## **Layout**

Jenkins and Dillman (1995<sup>[1]</sup>) suggest these general self-report survey design principles:

1. Use the visual elements of brightness, color, shape, and location in a consistent manner to define the desired navigational path for respondents to follow when answering the questionnaire.
2. When established format conventions are changed in the midst of a questionnaire use prominent visual guides to redirect respondents.
3. Place directions where they are to be used and where they can be seen.
4. Present information in a manner that does not require respondents to connect information from separate locations in order to comprehend it.

## **Pre-testing and piloting a survey**

### **Pre-testing**

1. Have a few people you know look over the survey and fill it out; ask for their feedback and suggestions and make relevant changes

### **Pilot testing**

1. Arrange for a small group from the target population to complete the survey; analyse their responses, ask for their feedback, and make relevant changes

It is important to understand the purpose of sampling, which is to permit generalization and do so with a tolerable margin of error.

## **Biases**

Several biases may influence the reliability and validity of results, including:

1. Social Desirability Bias
2. Order Effect
3. Fatigue effect
4. Novelty effect
5. Demand characteristics

## **After designing a survey**

Once a survey is designed, gather representative data] via sampling, then conduct data analysis.

### **Sampling**

There are many possible sampling strategies. It is worth considering their strengths, weaknesses, and applicability to your specific situation:

1. Random sampling
2. Systematic random sampling
3. Stratified sampling
4. Clustering sampling
5. Convenience sampling

### **Summary**

In summary, a survey research project should exhibit:

1. Clarity of research purposes, research questions and hypotheses.
2. Well worded survey questions.
3. An appropriate sampling method.