



Research Methodology and Research Methods

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Sampling Plan

Session # 7

Sampling Plan

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Sampling Plan

Steps in Conducting a Social Survey I

1. Topic/area to be researched
↓
2. Review literature/ theories relating to topic/area
↓
3. Formulate research questions
↓
4. Consider whether a social survey is appropriate (If not, consider an alternative research design)
↓
5. Consider what kind of population will be appropriate
↓
6. Consider what kind of sample design will be employed

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Sampling Plan

A Sample With No Sampling Error

Received appraisal Did not receive appraisal

n=50

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A Sample With Very Little Sampling Error

Received appraisal Did not receive appraisal

n=50

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A Sample With Some Sampling Error

Received appraisal Did not receive appraisal

n=50

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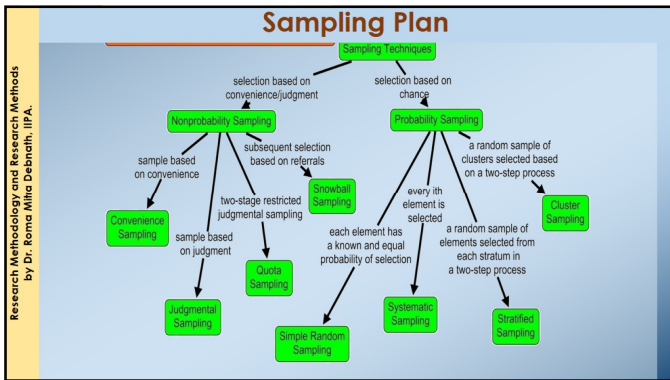
A Sample With a Lot of Sampling Error

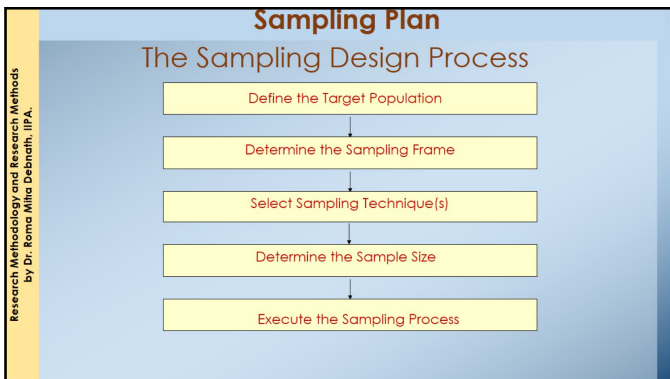
Received appraisal

Did not receive appraisal

n=50

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Sampling Plan

Define the Target Population

The target population is the collection of elements or objects that possess the information sought by the researcher and about which inferences are to be made.

- An **element** is the object about which or from which the information is desired, e.g., the respondent.
- **Extent** refers to the geographical boundaries.
- **Time** is the time period under consideration.

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Simple Random Sampling

- Each element in the population has a known and equal probability of selection.
- Each possible sample of a given size (n) has a known and equal probability of being the sample actually selected.
- This implies that every element is selected independently of every other element.

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Probability Samples

Simple Random Sampling

1. Select a suitable sampling frame.
2. Each element is assigned a number from 1 to N (pop. size).
3. Generate n (sample size) different random numbers between 1 and N.
4. The numbers generated denote the elements that should be included in the sample.

Systematic Sampling

- The sample is chosen by selecting a random starting point and then picking every i th element in succession from the sampling frame.
- The sampling interval, i , is determined by dividing the population size N by the sample size n and rounding to the nearest integer.
- When the ordering of the elements is related to the characteristic of interest, systematic sampling increases the representativeness of the sample.

Systematic Sampling

- If the ordering of the elements produces a cyclical pattern, systematic sampling may decrease the representativeness of the sample.

For example, there are 100,000 elements in the population and a sample of 1,000 is desired. In this case the sampling interval, i , is 100. A random number between 1 and 100 is selected. If, for example, this number is 23, the sample consists of elements 23, 123, 223, 323, 423, 523, and so on.

Stratified Sampling

- A two-step process in which the population is partitioned into subpopulations, or strata.
- The strata should be mutually exclusive and collectively exhaustive in that every population element should be assigned to one and only one stratum and no population elements should be omitted.
- Next, elements are selected from each stratum by a random procedure, usually SRS.
- A major objective of stratified sampling is to increase precision without increasing cost.

Stratified Sampling

- The elements within a stratum should be as homogeneous as possible, but the elements in different strata should be as heterogeneous as possible.
- The stratification variables should also be closely related to the characteristic of interest.

Stratified Sampling

- In **proportionate stratified sampling**, the size of the sample drawn from each stratum is proportionate to the relative size of that stratum in the total population.
- In **disproportionate stratified sampling**, the size of the sample from each stratum is proportionate to the relative size of that stratum and to the standard deviation of the distribution of the characteristic of interest among all the elements in that stratum.

Cluster Sampling

- The target population is first divided into mutually exclusive and collectively exhaustive subpopulations, or clusters.
- Then a random sample of clusters is selected, based on a probability sampling technique such as SRS.
- For each selected cluster, either all the elements are included in the sample .

Cluster Sampling

- Elements within a cluster should be as heterogeneous as possible, but clusters themselves should be as homogeneous as possible. Ideally, each cluster should be a small-scale representation of the population.

Convenience Sampling

Convenience sampling attempts to obtain a sample of convenient elements. Often, respondents are selected because they happen to be in the right place at the right time.

- Use of students, and members of social organizations
- Mall intercept interviews without qualifying the respondents
- Department stores using charge account lists
- "People on the street" interviews

Judgmental Sampling

Judgmental sampling is a form of convenience sampling in which the population elements are selected based on the judgment of the researcher.

- CEOs are selected in industrial research
- Expert's opinion etc.

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Quota Sampling

If you are a researcher conducting a national quota sample, you might need to know what proportion of (**gender**) is using toilets.

Quota sampling may be viewed as two-stage restricted judgmental sampling.

- The first stage consists of developing of population elements.
- In the second stage, sample elements are selected based on quota basis.

Variable categories	Population composition		Sample composition	
	Percentage	Number	Percentage	Number
Male	52	48	52	480
Females	48	52	48	480
	100	100	100	1000

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Snowball Sampling

In **snowball sampling**, an initial group of respondents is selected, usually at random.

- After being interviewed, these respondents are asked to identify others who belong to the target population of interest.
- Subsequent respondents are selected based on the referrals.

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Strengths and Weaknesses of Basic Sampling Techniques

Technique	Strengths	Weaknesses
Nonprobability Sampling Convenience sampling	Least expensive, least time-consuming, most convenient	Selection bias, sample not representative, not recommended for descriptive or causal research
Judgmental sampling	Low cost, convenient, not time-consuming	Does not allow generalization, subjective
Quota sampling	Sample can be controlled for certain characteristics	Selection bias, no assurance of representativeness
Snowball sampling	Can estimate rare characteristics	Time-consuming
Probability sampling Simple random sampling (SRS) Systematic sampling	Easily understood, results projectable Can increase representativeness, easier to implement than SRS, sampling frame not necessary	Difficult to construct sampling frame, expensive, lower precision, no assurance of representativeness Can decrease representativeness
Stratified sampling	Include all important subpopulations, precision	Difficult to select relevant stratification variables, not feasible to stratify on many variables, expensive
Cluster sampling	Easy to implement, cost effective	Imprecise, difficult to compute and interpret results

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Sample Size: Important Considerations

1. Absolute size more important than relative size
2. Time and cost
3. Non-response
4. Heterogeneity of the population
5. Kind of analysis to be conducted

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Confidence Interval

If the mean level of alcohol consumption is 9.7 units and the standard error of the mean is 1.3, we can be 95% certain the population mean will be between:

$$9.7 + (1.96 \times 1.3) = 12.248$$

$$9.7 - (1.96 \times 1.3) = 7.152$$

↙ ↘

95% certain population mean lies between
7.152 and 12.248

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What Is a Response Rate?

$$\frac{\text{number of usable questionnaires}}{\text{total sample - unsuitable or uncontactable members of the sample}} \times 100$$

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Sources of Bias in Quota Samples

- **Under-representation** of:
 - people in lower social strata
 - people who work in the private sector and manufacturing
 - people at the extremes of income
- **Over-representation** of:
 - women in households with children
 - people from larger households

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Limits to Generalization

- Findings can only be generalized to the population from which the sample was taken
- Findings may be specific to the characteristics of the population
- Findings may be locality specific
- Findings may be temporally specific

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