SAMPLING

PROF. KARUNESH SAXENA

ICCR CHAIR PROFESSOR

DBS PNG UNITECH LAE

Introduction

Once the researcher has formulated the problem and developed a research design including a questionnaire,he has to decide whether the information is to be collected from all the people comprising the population.If the data is collected from each member of the population of interest,it is called CENSUS SURVEY. If the data are to be collected only from some members of the population it is known as SAMPLE SURVEY.Thus, the researcher has to decide whether he has to conduct census survey or a sample survey.

WHAT IS SAMPLING ?

Sampling is the process by which we study a small part of population to make judgements about the entire population.

BASIC CONCEPTS IN SAMPLING

- ***Population:*** **the entire group under study as defined by research objectives. Sometimes called the "universe." Any finite or infinite collection of individuals is called population.**

  Researchers define populations in *specific terms* such as heads of households, individual person types, families, types of retail outlets, etc. Geographic location and Time of study are also considered.

BASIC CONCEPTS IN SAMPLING

- ***Sample:*** **a subset of the population that is replica of the entire group.**
- ***Sample unit:*** **the basic level of investigation. consumers, store managers, shelf-facings, teens, etc. The research objective should define the sample unit.**
- ***Census:*** **an accounting of the complete population.**

BASIC CONCEPTS IN SAMPLING

- ***Sampling error:*** **any error that occurs in a survey because a sample is used (random error)**
- ***Sample frame:*** **a master list of the population (total or partial) from which the sample will be drawn**
- ***Sample frame error (SFE):*** **the degree to which the sample frame fails to account for all of the defined units in the population (e.g a telephone book listing does not contain unlisted numbers) leading to sampling frame error.**

REASONS FOR TAKING A SAMPLE

- ***Practical considerations such as cost and population size***
- ***Inability of researcher to analyze large quantities of data potentially generated by a census***
- ***Samples can produce sound results if proper rules are followed for the draw***

BASIC SAMPLING CLASSIFICATIONS

- ***Probability samples:*** **ones in which members of the population have a known chance (probability) of being selected**

- ***Non-probability samples:*** **instances in which the chances (probability) of selecting members from the population are unknown**

PROBABILITY SAMPLING METHODS
1. SIMPLE RANDOM SAMPLING

- ***Simple random sampling:*** **the probability of being selected is "known and equal" for all members of the population**
  - ***Blind Draw Method (e.g. names "placed in a hat" and then drawn randomly)***
  - ***Random Numbers Method (all items in the sampling frame given numbers, numbers then drawn using table or computer program)***

SIMPLE RANDOM SAMPLING

Advantages:

Known and equal chance of selection

Easy method when there is an electronic database

- *Disadvantages: (Overcome with electronic database)*
  - **Complete accounting of population needed**
  - **Cumbersome to provide unique designations to every population member**
  - **Very inefficient when applied to skewed population distribution.**

2. SYSTEMATIC SAMPLING

- ***Systematic sampling:*** **way to select a probability-based sample from a directory or list. This method is at times more efficient than simple random sampling. This is a type of cluster sampling method. In this method first sampling fraction is calculated and then we choose the no. from this fraction to get the rest sample units. And follow the trend of that no.**

SYSTEMATIC SAMPLING

- *Advantages:*
  - Known and equal chance of any of the SI "clusters" being selected.
  - Efficiency..do not need to designate (assign a number to) every population member, just those early on on the list (unless there is a very large sampling frame).
  - Less expensive…faster than SRS.
- *Disadvantages:*
  - Small loss in sampling precision
  - Potential "periodicity" problems

3. CLUSTER SAMPLING

- ***Cluster sampling:*** **method by which the population is divided into groups (clusters), any of which can be considered a representative sample. These clusters are mini-populations and therefore are heterogeneous. Once clusters are established a random draw is done to select one (or more) clusters to represent the population.**

CLUSTER SAMPLING

- ***Advantages***
  - ***Economic efficiency … faster and less expensive than SRS***
  - ***Does not require a list of all members of the universe***

- ***Disadvantage:***
  - **Cluster specification error…the more homogeneous the cluster chosen, the more imprecise the sample results**

4. CLUSTER SAMPLING – AREA METHOD

- ***Drawing the area sample:***
  - **Divide the geo area into sectors (subareas) and give them names/numbers, determine how many sectors are to be sampled (typically a judgment call), randomly select these subareas. Do either a census or a systematic draw within each area.**
  - **To determine the total geo area estimate add the counts in the subareas together and multiply this number by the ratio of the total number of subareas divided by number of subareas.**

5. STRATIFIED SAMPLING METHOD

- This method is used when the population distribution of items is skewed. It allows us to draw a more representative sample. Hence if there are more of certain type of item in the population the sample has more of this type and if there are fewer of another type, there are fewer in the sample.

STRATIFIED SAMPLING

- ***Stratified sampling:*** **the population is separated into homogeneous groups/segments/strata and a sample is taken from each. The results are then combined to get the picture of the total population.**
- **Sample stratum size determination**
  - ***Proportional method (stratum share of total sample is stratum share of total population)***
  - ***Disproportionate method (variances among strata affect sample size for each stratum)***

STRATIFIED SAMPLING

- ***Advantage:***
  - **More accurate overall sample of skewed population.**
- ***Disadvantage:***
  - **More complex sampling plan requiring different sample sizes for each stratum**

NONPROBABILITY SAMPLING METHODS
1. CONVENIENCE SAMPLING METHOD

- ***Convenience samples:*** **samples drawn at the convenience of the interviewer. People tend to make the selection at familiar locations and to choose respondents who are like themselves.**

Error occurs

- **In the form of members of the population who are infrequent or nonusers of that location.**
- **It introduces a bias in the estimate.**

2. JUDGMENT SAMPLING METHOD

- ***Judgment samples:*** **samples that require a judgment or an "educated guess" on the part of the interviewer as to who should represent the population. Also, "judges" (informed individuals) may be asked to suggest who should be in the sample.**
  - **Subjectivity enters in here, and certain members of the population will have a smaller or no chance of selection compared to others**

3. SNOWBALL SAMPLING METHOD

- ***Referral samples (snowball samples):*** **samples which require respondents to provide the names of additional respondents.**
  - **Members of the population who are less known, disliked, or whose opinions conflict with the respondent have a low probability of being selected.**
  - **It may introduce the biasness as**
  - **Reduced sample size and low cost.**

4. QUOTA CONTROL SAMPLING METHOD

- ***Quota samples:*** samples that set a specific number of certain types of individuals to be interviewed. And it is not based on random relation.
  - **Often used to ensure that convenience samples will have desired proportion of different respondent classes.**
  - **It is economical as travelling cost can be reduced.**
  - **The selection depends on the mood of the interviewer.**
  - **All credit is to interviewer so quality work may suffer.**

ONLINE SAMPLING TECHNIQUES

- ***Random online intercept sampling:*** **relies on a random selection of Web site visitors**
- ***Invitation online sampling:*** **is when potential respondents are alerted that they may fill out a questionnaire that is hosted at a specific Web site**
- ***Online panel sampling:*** **refers to consumer or other respondent panels that are set up by marketing research companies for the explicit purpose of conducting online surveys with representative samples**

SAMPLE SIZE DECISION

The sample size decision is a very important topic in the sampling process. There are two basic approaches to the sample size –

- Ad hoc or Practical approach and
- The Statistical approach.

But the formal is widely used in marketing research.

Main Consideration of **SAMPLE SIZE DECISION**

The Judgment of the researcher

1. The extend of error or impression allowed.
2. The degree of confidence desired in the estimate.

The responsibility of the researcher

3. Estimate of the standard deviation of the population.


THANKS