UNIT - III

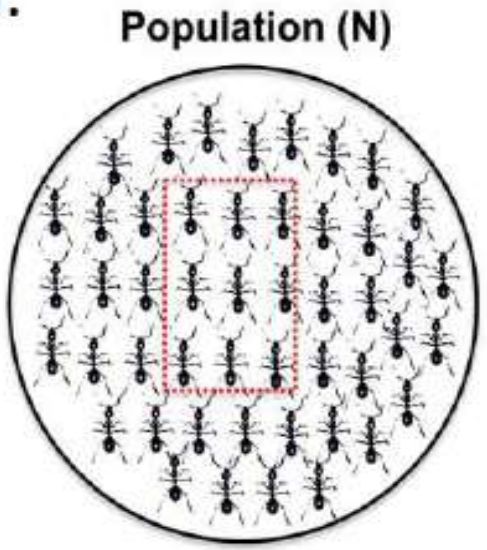
Sampling Techniques

SAMPLING

- A sample is “a smaller (but hopefully representative) collection of units from a population used to determine truths about that population” (Field, 2005)
- Why sample?
  - Resources (time, money) and workload
  - Gives results with known accuracy that can be calculated mathematically
- The sampling frame is the list from which the potential respondents are drawn
  - Registrar’s office
  - Class rosters
  - Must assess sampling frame errors

INTRODUCTION

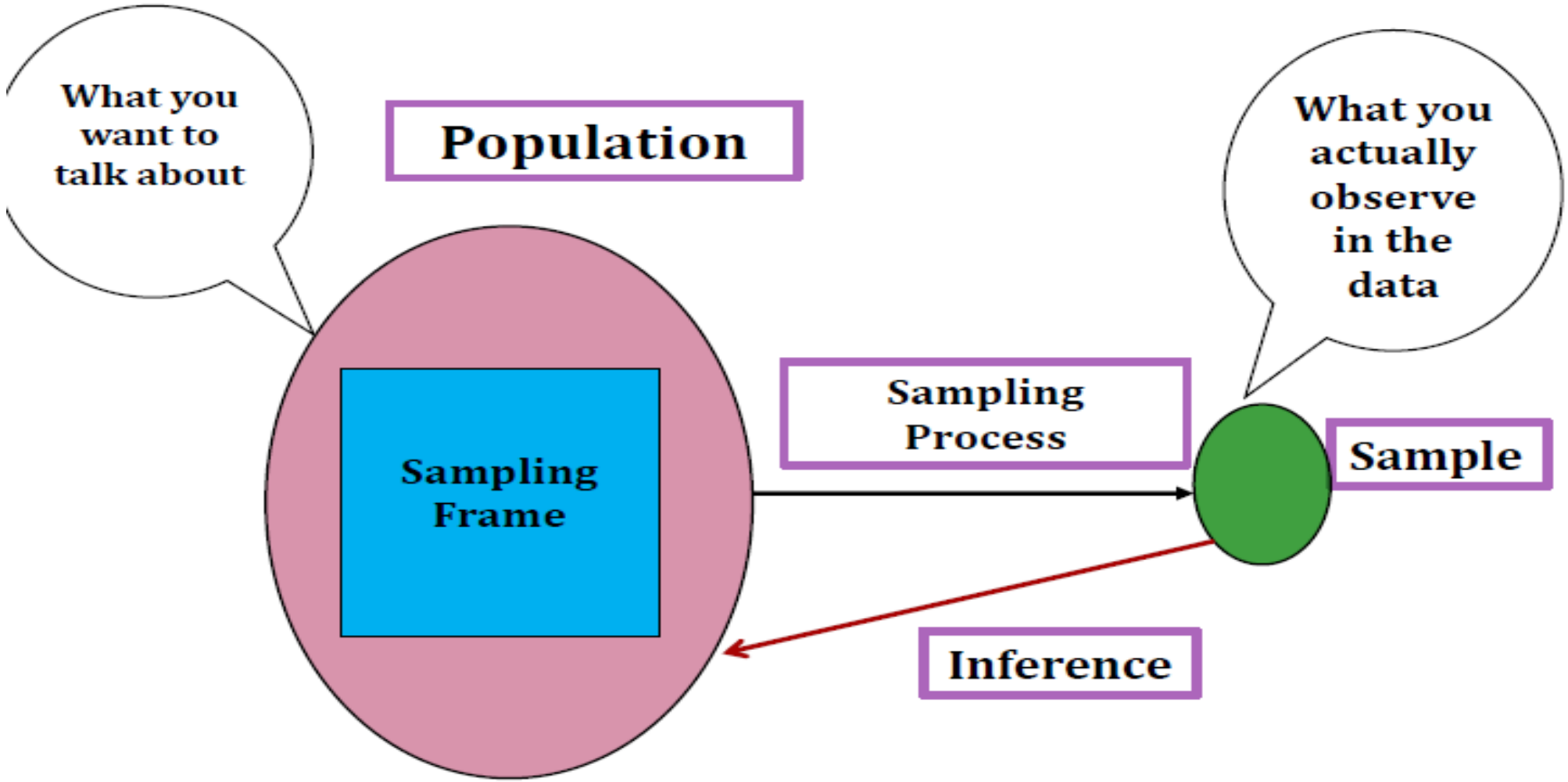
Sampling is the process of selecting observations (a sample) to provide an adequate description and inferences of the population.



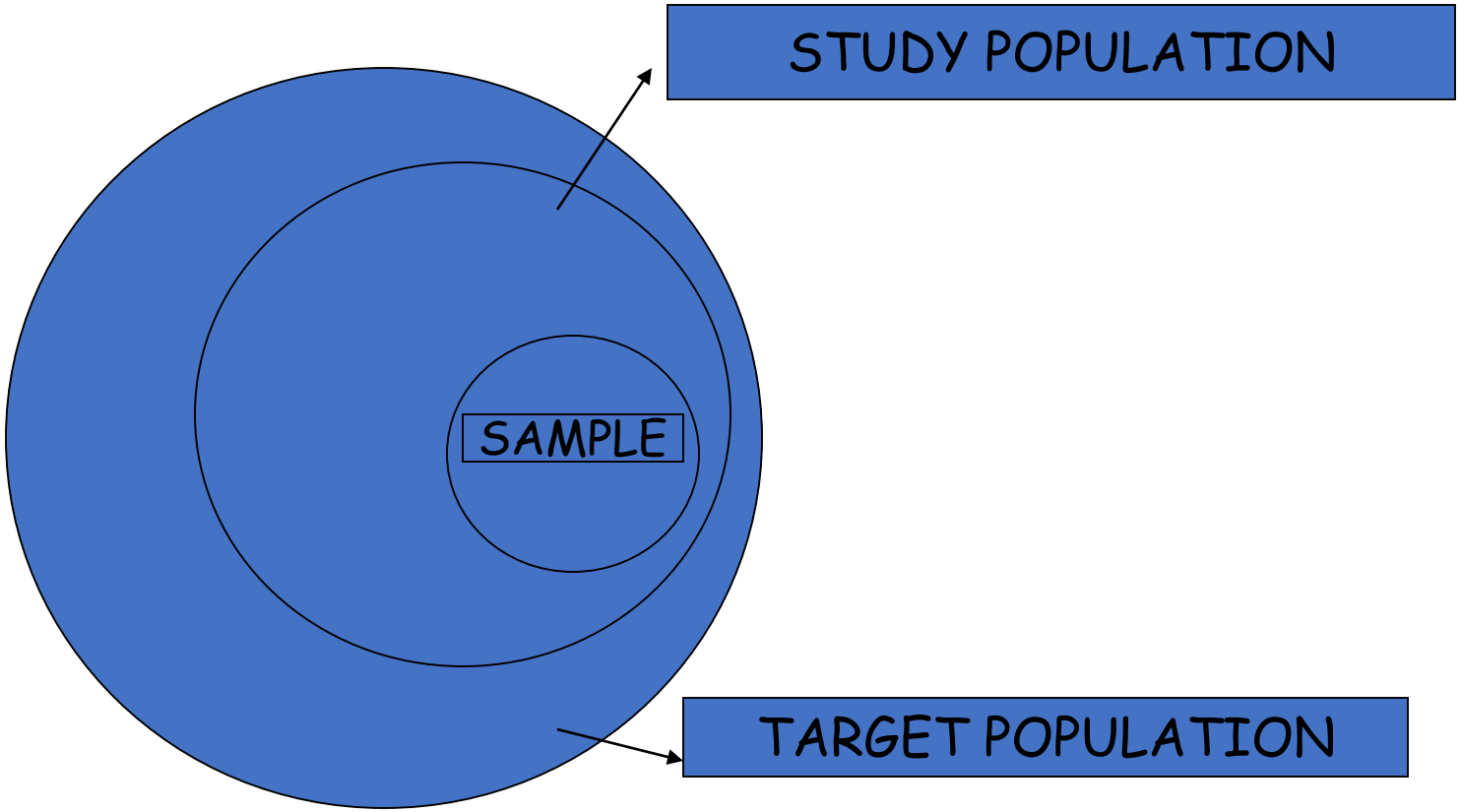
- Sample
  - It is a unit that is selected from population
  - Represents the whole population
  - Purpose to draw the inference
- Why Sample???
- Sampling Frame

  Listing of population from which a sample is chosen

SAMPLING


What you want to talk about
Population
What you actually observe in the data
Sampling Frame
Sampling Process
Sample
Inference

SAMPLING.....



SAMPLING……

- What is your population of interest?
    - To whom do you want to generalize your results?
        - All doctors
        - School children
        - Indians
        - Women aged 15-45 years
        - Other
- Can you sample the entire population?

SAMPLING…….

- 3 factors that influence sample representative-ness
  - Sampling procedure
  - Sample size
  - Participation (response)

- When might you sample the entire population?
  - When your population is very small
  - When you have extensive resources
  - When you don’t expect a very high response

Technical Terminology

- An element is an object on which a measurement is taken.
- A population is a collection of elements about which we wish to make an inference.
- Sampling units are nonoverlapping collections of elements from the population that cover the entire population.

Technical Terms

- A sampling frame is a list of sampling units.
- A sample is a collection of sampling units drawn from a sampling frame.
- Parameter: numerical characteristic of a population
- Statistic: numerical characteristic of a sample

Interviewers

- Interviewers have a direct and dramatic effect on the way a person responds to a question.
  - Most people tend to side with the view apparently favored by the interviewer, especially if they are neutral.
  - Friendly interviewers are more successful.
  - In general, interviewers of the same gender, racial, and ethnic groups as those being interviewed are slightly more successful.

Respondents

- Respondents differ greatly in motivation to answer correctly and in ability to do so.
- Obtaining an honest response to sensitive questions is difficult.
- Basic errors
  - Recall bias: simply does not remember
  - Prestige bias: exaggerates to ‘look’ better
  - Intentional deception: lying
  - Incorrect measurement: does not understand the units or definition

Census Sample

- A census study occurs if the entire population is very small or it is reasonable to include the entire population (for other reasons).

- It is called a census sample because data is gathered on every member of the population.

Probability versus Nonprobability

- **Probability Samples:** each member of the population has a known non-zero probability of being selected
  - Methods include random sampling, systematic sampling, and stratified sampling.
- **Nonprobability Samples:** members are selected from the population in some nonrandom manner
  - Methods include convenience sampling, judgment sampling, quota sampling, and snowball sampling

PROBABILITY SAMPLING

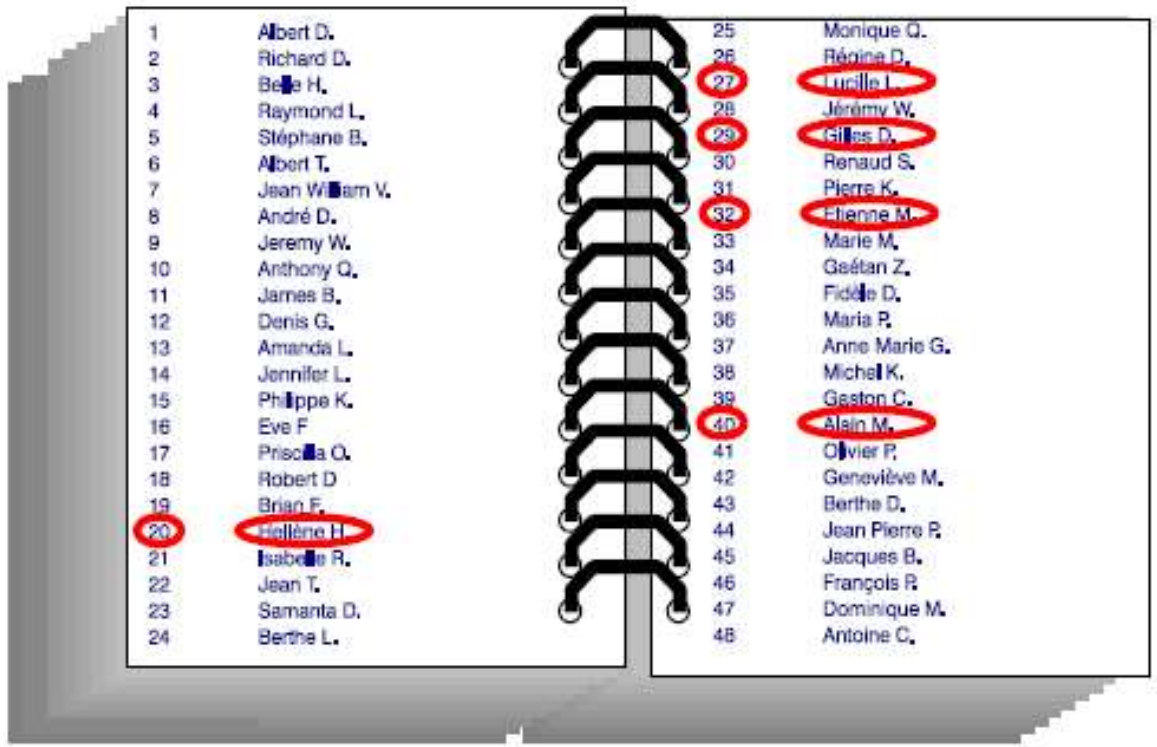
Random Sampling

Random sampling is the purest form of probability sampling.

- Each member of the population has an equal and known chance of being selected.
- When there are very large populations, it is often ‘difficult’ to identify every member of the population, so the pool of available subjects becomes biased.
    - You can use software, such as minitab to generate random numbers or to draw directly from the columns

SIMPLE RANDOM SAMPLING

- All subsets of the frame are given an equal probability.
- Random number generators



SIMPLE RANDOM SAMPLING

Advantages:

- Minimal knowledge of population needed
- Easy to analyze data

Disadvantages:

- Low frequency of use
- Does not use researchers' expertise
- Larger risk of random error

Stratified Sampling

- **Stratified sampling** is commonly used probability method that is superior to random sampling because it reduces sampling error.

- A stratum is a subset of the population that share at least one common characteristic; such as males and females.

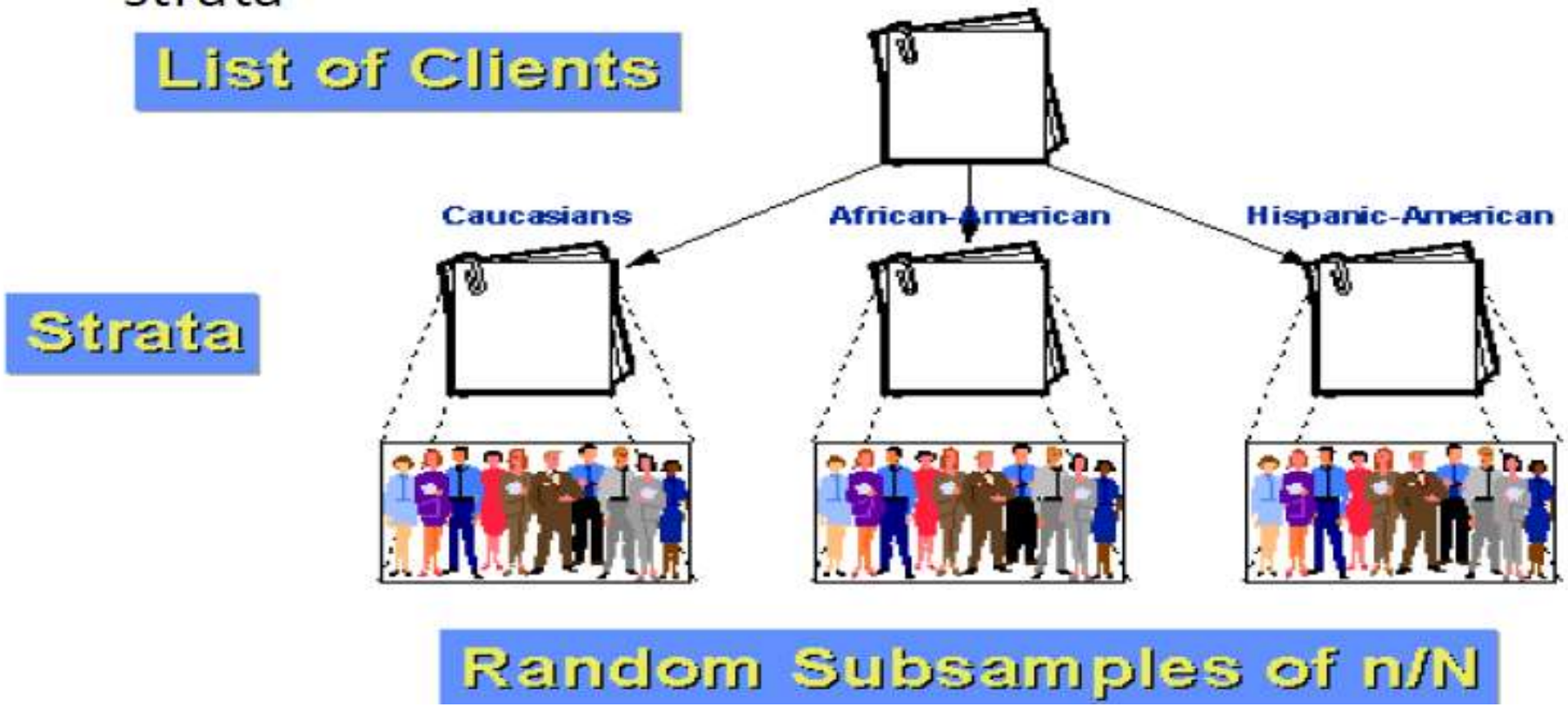
  - Identify relevant stratums and their actual representation in the population.

  - Random sampling is then used to select a *sufficient* number of subjects from each stratum.

  - Stratified sampling is often used when one or more of the stratums in the population have a low incidence relative to the other stratums.

STRATIFIED RANDOM SAMPLING

- Population is divided into two or more groups called strata
- Subsamples are randomly selected from each strata



STRATIFIED RANDOM SAMPLING

Advantages:

- Assures representation of all groups in sample population
- Characteristics of each stratum can be estimated and comparisons made

Disadvantages:

- Requires accurate information on proportions of each stratum
- Stratified lists costly to prepare

Cluster Sampling

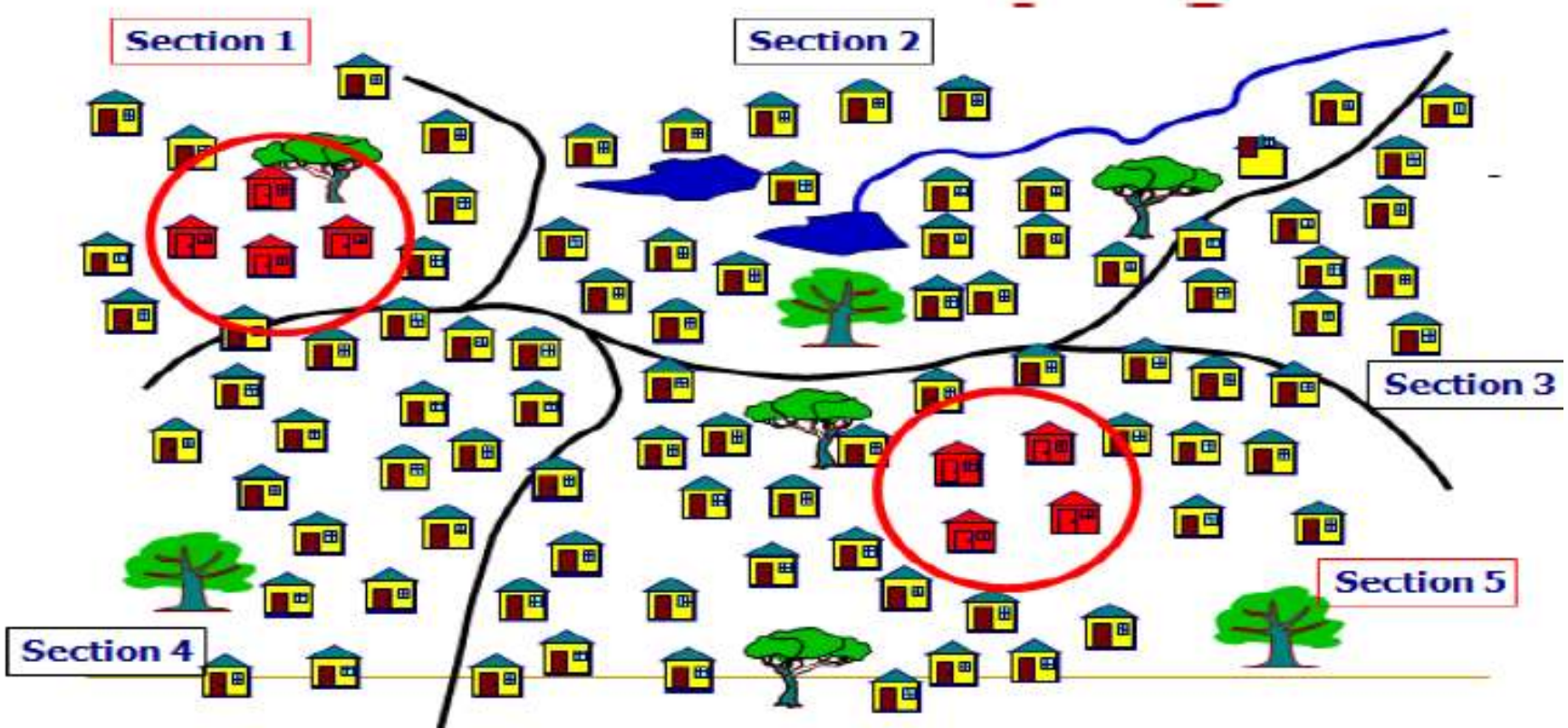
- Cluster Sample: a probability sample in which each sampling unit is a collection of elements.

- Effective under the following conditions:
  - A good sampling frame is not available or costly, while a frame listing clusters is easily obtained
  - The cost of obtaining observations increases as the distance separating the elements increases

- Examples of clusters:
  - City blocks – political or geographical
  - Housing units – college students
  - Hospitals – illnesses
  - Automobile – set of four tires

CLUSTER SAMPLING

- The population is divided into subgroups (clusters) like families.
- A simple random sample is taken from each cluster



CLUSTER SAMPLING

Advantages:

- Can estimate characteristics of both cluster and population

Disadvantages:

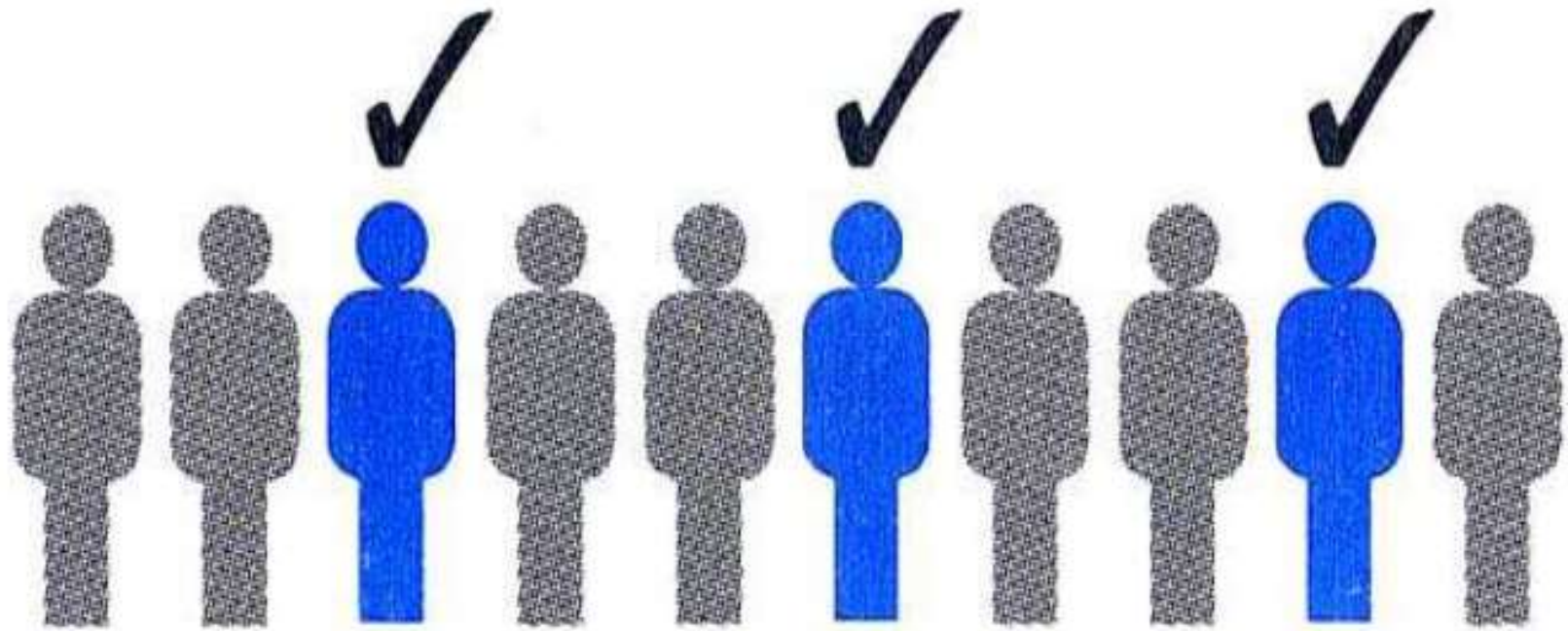
- The cost to reach an element to sample is very high
- Each stage in cluster sampling introduces sampling error—the more stages there are, the more error there tends to be

Systematic Sampling

- **Systematic sampling** is often used instead of random sampling. It is also called an Nth name selection technique.
- After the required sample size has been calculated, every Nth record is selected from a list of population members.
- As long as the list does not contain any hidden order, this sampling method is as good as the random sampling method.
- Its only advantage over the random sampling technique is simplicity (and possibly cost effectiveness).

SYSTEMATIC RANDOM SAMPLING

- Order all units in the sampling frame
- Then every nth number on the list is selected
- N= Sampling Interval



SYSTEMATIC RANDOM SAMPLING

Advantages:

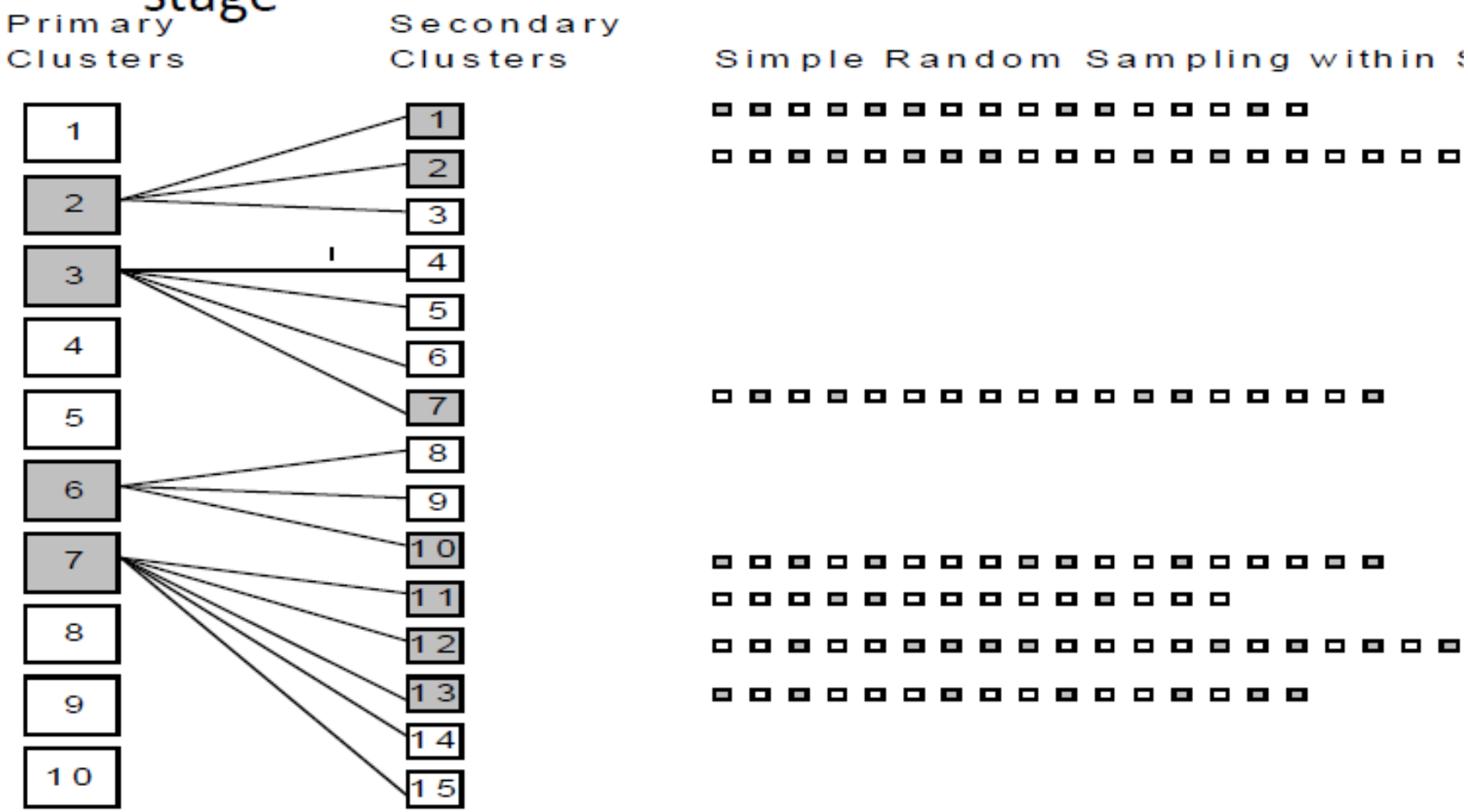
- Moderate cost; moderate usage
- Simple to draw sample
- Easy to verify

Disadvantages:

- Periodic ordering required

MULTISTAGE SAMPLING

- Carried out in stages
- Using smaller and smaller sampling units at each stage



MULTISTAGE SAMPLING

Advantages:

- More Accurate
- More Effective

Disadvantages:

- Costly
- Each stage in sampling introduces sampling error—the more stages there are, the more error there tends to be

NONPROBABILITY SAMPLES

NONPROBABILITY SAMPLES

- The probability of each case being selected from th total population is not known.
- Units of the sample are chosen on the basis of personal judgment or convenience.
- There are NO statistical techniques for measuring random sampling error in a non-probability sample

NONPROBABILITY SAMPLES

- A. Convenience Sampling
- B. Quota Sampling
- C. Judgmental Sampling (Purposive Sampling)
- D. Snowball sampling
- E. Self-selection sampling

A. Convenience Sampling

- **Convenience sampling** is used in exploratory research where the researcher is interested in getting an inexpensive approximation.
- The sample is selected because they are convenient.
- It is a nonprobability method.
  - Often used during preliminary research efforts to get an estimate without incurring the cost or time required to select a random sample

A. CONVENIENCE SAMPLING

- Convenience sampling involves choosing respondents at the convenience of the researcher.

Advantages

- Very low cost
- Extensively used/understood

Disadvantages

- Variability and bias cannot be measured or controlled
- Projecting data beyond sample not justified
- Restriction of Generalization.

B. Quota Sampling

- **Quota sampling** is the nonprobability equivalent of stratified sampling.
    - First identify the stratums and their proportions as they are represented in the population
    - Then convenience or judgment sampling is used to select the required number of subjects from each stratum.

B. QUOTA SAMPLING

- The population is first segmented into mutually exclusive sub-groups, just as in stratified sampling.

Advantages

- Used when research budget is limited
- Very extensively used/understood
- No need for list of population elements

Disadvantages

- Variability and bias cannot be measured/controlled
- Time Consuming
- Projecting data beyond sample not justified

C. Judgment Sampling

- **Judgment sampling** is a common nonprobability method.
- The sample is selected based upon judgment.
  - an extension of convenience sampling
- When using this method, the researcher must be confident that the chosen sample is truly representative of the entire population.

C. JUDGEMENTAL SAMPLING

- Researcher employs his or her own "expert" judgment about.

Advantages

- There is a assurance of Quality response
- Meet the specific objective.

Disadvantages

- Bias selection of sample may occur
- Time consuming process.

D. Snowball Sampling

- **Snowball sampling** is a special nonprobability method used when the desired sample characteristic is rare.
- It may be extremely difficult or cost prohibitive to locate respondents in these situations.
- This technique relies on referrals from initial subjects to generate additional subjects.
- It lowers search costs; however, it introduces bias because the technique itself reduces the likelihood that the sample will represent a good cross section from the population.

D. SNOWBALL SAMPLING

- The research starts with a key person and introduce the next one to become a chain

Advantages

- Low cost
- Useful in specific circumstances & for locating rare populations

Disadvantages

- Not independent
- Projecting data beyond sample not justified

E. SELF-SELECTION SAMPLING

- It occurs when you allow each case usually individuals, to identify their desire to take part in the research.

Advantages

- More accurate
- Useful in specific circumstances to serve the purpose.

Disadvantages

- More costly due to Advertizing
- Mass are left

Sample Size?

- The more heterogeneous a population is, the larger the sample needs to be.
- Depends on topic – frequently it occurs?
- For probability sampling, the larger the sample size, the better.
- With nonprobability samples, not generalizable regardless – still consider stability of results

Response Rates

- About 20 – 30% usually return a questionnaire
- Follow up techniques could bring it up to about 50%
- Still, response rates under 60 – 70% challenge the integrity of the random sample
- How the survey is distributed can affect the quality of sampling

SAMPLING ERRORS

- The errors which arise due to the use of sampling surveys are known as the sampling errors.

Two types of sampling errors

- **Biased Errors-** Due to selection of sampling techniques; size of the sample.
- **Unbiased Errors / Random sampling errors-** Differences between the members of the population included or not included.

Type 1 error

- The probability of finding a difference with our sample compared to population, and there really isn't one….
- Known as the α (or "type 1 error")
- Usually set at 5% (or 0.05)

Type 2 error

- The probability of not finding a difference that actually exists between our sample compared to the population…
- Known as the β (or “type 2 error”)
- Power is (1- β) and is usually 80%

METHODS OF REDUCING SAMPLING ERRORS

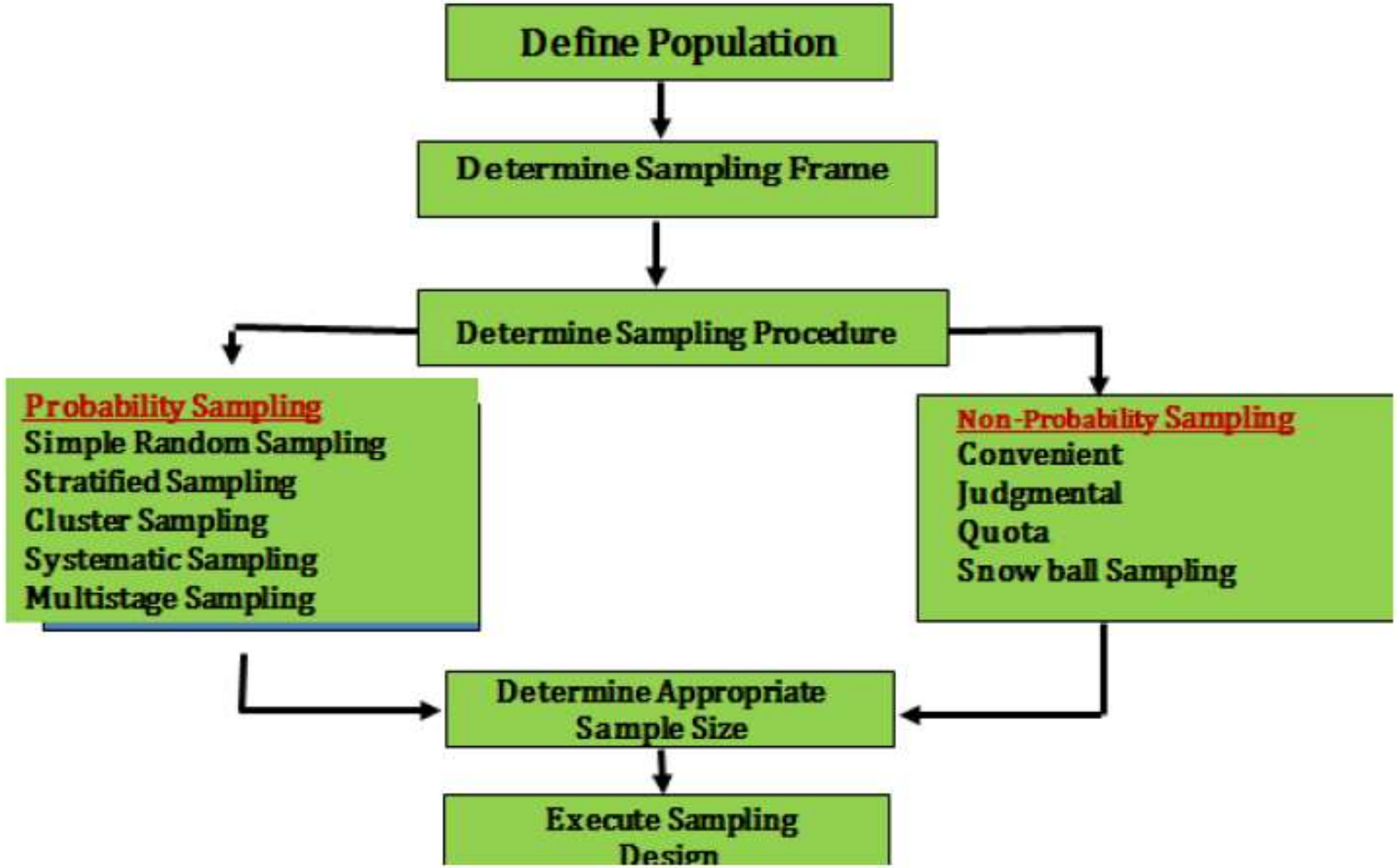
- Specific problem selection.
- Systematic documentation of related research.
- Effective enumeration.
- Effective pre testing.
- Controlling methodological bias.
- Selection of appropriate sampling techniques.

NON-SAMPLING ERRORS

- Non-sampling errors refers to biases and mistakes in selection of sample.

- **CAUSES FOR NON-SAMPLING ERRORS**
  - Sampling operations
  - Inadequate of response
  - Misunderstanding the concept
  - Lack of knowledge
  - Concealment of the truth.
  - Loaded questions
  - Processing errors
  - Sample size

SAMPLING DESIGN PROCESS



Data Collection

What is Data?

- Data is a existing information/knowledge *represented* or *coded* in some form suitable for better usage or processing.

- Data is a set of values of qualitative or quantitative variables.

Quantitative Vs Qualitative Data

- Quantitative data are anything that can be expressed as a number, or quantified. These data may be represented by ordinal, interval or ratio scales and lend themselves to most statistical manipulation.
- Qualitative data is a categorical measurement expressed not in terms of numbers, but rather by means of a natural language description. In statistics, it is often used interchangeably with "categorical" data.

  For example: favorite color = "blue"

Quantitative Vs Qualitative Data

- Quantitative and Qualitative data can be gathered from the same data unit depending on whether the variable of interest is numerical or categorical. For example:

Data unit	Numeric variable	= Quantitative data	Categorical variable	= Qualitative data
A person	"*How many* children do you have?"	**2** children	"In *which country* were your children born?"	**India**
	"*How much* do you earn?"	**Rs.60,000** p.m.	"*What* is your occupation?"	**Teacher**
	"How many hours do you work?"	**40** hours per week	"Do you work *full-time or part-time*?"	**Full-time**

Primary and Secondary Data

- The task of data collection begins after a research problem has been defined and research design/plan chalked out.

- While deciding about the method of data collection to be used for the study, the researcher should keep in mind two types of data viz., primary and secondary.

Primary and Secondary Data

- Primary Data are collected by the researcher.
- Secondary data collected by someone else and have already been passed through the statistical process.
- A researcher as per requirement of study may decide on use of primary data or secondary data or both.
- Both primary and secondary data have their own pros and cons.

Methods of Collecting Data

- The methods of collecting data mainly refers to collecting primary data.

- As secondary data are already available, we have to carefully choose the sources , relevancy of data and reliability.

Collecting Secondary Data

- Sources of secondary data are existing literature, Reports of professional agencies, Departments, Archives, Internet, etc.

- While collecting secondary data one has to follow legal procedures required and maintain the academic ethics.

Methods of Collecting Primary Data

There are several methods of collecting primary data, particularly in surveys and descriptive research. Important ones are-

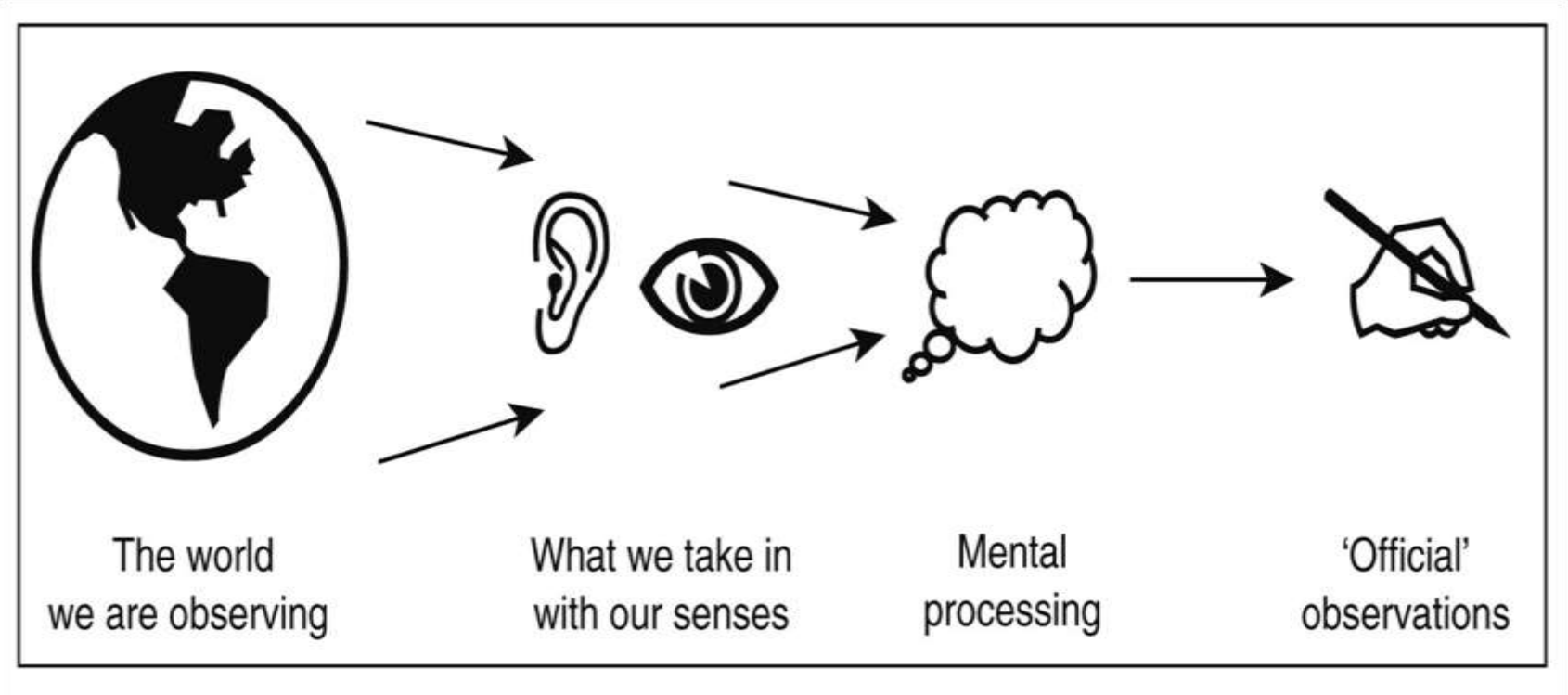
- Observation
- Interview
- Questionnaire
- Schedule
- Other Methods

Observation

See what is happening

- traffic patterns
- land use patterns
- layout of city and rural areas
- quality of housing
- condition of roads
- conditions of buildings
- who goes to a health clinic

Filtering Observations



Observation is Helpful when:

- Need direct information
- Trying to understand ongoing behavior
- There is physical evidence, products, or outputs than can be observed
- Need to provide alternative when other data collection is infeasible or inappropriate

Types of Observation

- Participatory and Non Participatory
- Candid and Covert
- Structured, Semi-structured and Unstructured.
- Controlled and Uncontrolled

Advantages/Disadvantages of Observation

Advantages:

- Subjective bias eliminated
- Researcher gets current information
- Independent of Respondents
- Disadvantages:
- Expensive, Time consuming
- Limited information
- Unforeseen factors may influence observation

Interview

- The interview method of collecting data involves presentation of oral-verbal stimuli and reply in terms of oral-verbal responses.
- This method can be used through personal interviews or telephone interviews.
- Structured, Semi-Structured or Unstructured Interview.

Interview Types

- **Personal Interviews:** Interviewer asking questions generally in a face-to-face contact to the other person or persons. Direct personal investigation or Indirect oral investigation.
- **Focused Interview** is meant to focus attention on the given experience of the respondent and its effects.
- **Clinical Interview** is concerned with broad underlying feelings or motivations or with the course of individual's life experience.
- **Non-directive Interview** is that where the interviewer's function is simply to encourage the respondent to talk about the given topic with a bare minimum of direct questioning.

Skill of Interviewer

The main game in interviewing is to facilitate an interviewee's ability to answer.

This involves:

- easing respondents into the interview
- asking strategic questions
- prompting and probing appropriately
- keeping it moving
- winding it down when the time is right

Merits/Demerits of Interview

Merits:

- More and in depth information obtained
- Personal Information
- Greater Flexibility
- Adaptation as per the respondent

Demerits:

- Bias of Interviewer
- Expensive/Time Consuming
- Need expertise

Questionnaire Method

- A questionnaire is sent (usually by post) to persons concerned with a request to answer the questions and return the questionnaire.

- A questionnaire consists of a number of questions printed in a definite order.

- The respondents have to answer the questions on their own.

Steps in questionnaire construction

- Preparation
- Constructing the first draft
- Self-evaluation
- External evaluation
- Revision
- Pre-test or Pilot study
- Revision
- Second pre-testing
- Preparing final draft

Essentials of a Good Questionnaire

- Questionnaire should be short and simple
- Question arranged in from simple to difficult.
- Personal and intimate questions should be left to the end.
- Technical term and vague expression should be avoided.
- Questions should be answered in yes or no ; multiple choice.
- Control question to cross check the information of the responded.

Advantages of Questionnaire

- Lower cost
- Time saving
- Accessibility to widespread respondents
- No interviewer’s bias
- Greater anonymity
- Respondent’s convenience
- Standard wordings
- No Variation

Disadvantages of questionnaire

- Questionnaires can be used only for educated people.
- Sometimes different respondent’s interpreted questions differently
- Questionnaires do not provide an opportunity to collect additional information
- Researchers are not sure whether the person to whom the questionnaire was mailed has himself answered the questions.
- Many questions remain unanswered
- The respondent can consult other persons before filling in the questionnaire.

Collection of Data Through Schedule

- Schedules like questionnaires contain a set of questions.
- Researcher /Enumerators appointed collect data through schedules.
- Enumerators go to the field, put questions to the respondents and fill the schedules.
- Enumerators need to be trained.

Questionnaire Vs. Schedule

Questionnaire

- Mailed, filled by Respondent
- Economical
- Non-Response high
- Time Consuming
- Literate, co-operative respondents
- Success depends on quality of questionnaire

Schedule

- Direct contact , filled by Researcher or Enumerator
- Expensive
- Non-Response low
- Time bound
- No such pre condition
- Success depends on quality of enumerator

Some Other Methods

- Warranty Cards Post card size cards sent to customers and feedback collected through asking questions.
- Distributor or Store Audits are performed by manufacturer/distributor through salesmen. Information so obtained are used to estimate market size, market share, seasonal sales pattern, etc.
- Pantry Audits From the observation of pantry of customer to know purchase habit of people (of which product, what brand, etc.). Questions may be asked at the time of audit.

Some Other Methods

- Consumer Panels Pantry audit approach on a regular basis is known as ‘consumer panel’, where a set of consumers are arranged to come to an understanding to maintain detailed daily records of their consumption and the same is made available to investigator on demands.
- Projective techniques developed by psychologists to use projections of respondents for inferring about underlying motives, urges, or intentions which are such that the respondent either resists to reveal them or is unable to figure out himself.

Some Other Methods

- Use of Mechanical Devices Eye Camera is used to record the focus of eyes of a respondent on a specific portion of a sketch or diagram or written material. Psychogalvanometer is used for measuring the extent of body excitement as a result of the visual stimulus. Motion picture camera is used to record movement of consumer at time of purchase. Audiometer is used to know the preferences to TV channels, programmes.

Some Other Methods

- Depth interviews are those interviews that are designed to discover underlying motives and desires and are often used in motivational research. Indirect question or projective technique are used to know the behaviour of respondents.

- Content Analysis Analyzing the contents of documentary materials such as books, magazines, newspapers and the contents of all other verbal materials which can be either spoken or printed.

Selection of Appropriate Method of Data Collection

- Nature, Scope and Object of enquiry
- Availability of Fund
- Availability of Time
- Degree of Precision Required

Precautions in Data Collection

- The data must be relevant to the research problem.
- It should be collected through formal or standardized research tools.
- The data should be such as these can be subjected to statistical treatment easily.
- The data should have minimum measurement error.

Precautions in Data Collection

- The data must be tenable for the verification of the hypotheses.
- The data should be collected through objective procedure.
- The data should be accurate and precise.
- The data should be reliable and valid
- The data should be complete in itself and also comprehensive in nature.

QUESTIONNAIRE

What Is A Questionnaire?

A tool for collecting information to describe, compare, or explain an event or situation, as well as, knowledge, attitudes, behaviors, and/or sociodemographic characteristics on a particular target group.

Questionnaire General Format

- Self-administered (by mail or personal contact)
- In person (face-to-face)
- Telephone interviews

Questionnaires in Clinical Research

- Much of the data in clinical research is gathered using questionnaires or interviews.
- The validity of the results depends on the quality of these instruments.
  - Good questionnaires are difficult to construct; bad questionnaires are difficult to analyze.
- Difficult to design for several reasons:
  - Each question must provide a valid and reliable measure.
  - The questions must clearly communicate the research intention to the survey respondent.
  - The questions must be assembled into a logical, clear instrument that flows naturally and will keep the respondent sufficiently interested to continue to cooperate.

Quality aims in survey research

Goal is to collect information that is:

- **Valid**: measures the quantity or concept that is supposed to be measured
- **Reliable:** measures the quantity or concept in a consistent or reproducible manner
- **Unbiased:** measures the quantity or concept in a way that does not systematically under- or overestimate the true value
- **Discriminating:** can distinguish adequately between respondents for whom the underlying level of the quantity or concept is different

Steps to design a questionnaire:

1. Write out the primary and secondary aims of your study.
2. Write out concepts/information to be collected that relates to these aims.
3. Review the current literature to identify already validated questionnaires that measure your specific area of interest.
4. Compose a draft of your questionnaire.
5. Revise the draft.
6. Assemble the final questionnaire.

Step 1: Define the aims of the study

- Write out the problem and primary and secondary aims using **one** sentence per aim. Formulate a plan for the statistical analysis of each aim.
- Make sure to define the target population in your aim(s).

Step 2: Define the variables to be collected

- Write a detailed list of the information to be collected and the concepts to be measured in the study. Are you trying to identify:
  - Attitudes
  - Needs
  - Behavior
  - Demographics
  - Some combination of these concepts
- Translate these concepts into variables that can be **measured**.
- Define the role of each variable in the statistical analysis:
  - Predictor
  - Confounder
  - Outcome

Step 3: Review the literature

- Review current literature to identify related surveys and data collection instruments that have measured concepts similar to those related to your study's aims.
- Saves development time and allows for comparison with other studies if used appropriately.
- Proceed with caution if using only a subset of an existing questionnaire as this may change the meaning of the scores. Contact the authors of the questionnaire to determine if a smaller version of the instrument exists that has also been validated.

Step 4: Compose a draft

- Determine the mode of survey administration: face-to-face interviews, telephone interviews, self-completed questionnaires, computer-assisted approaches.
- Write more questions than will be included in the final draft.
- Format the draft as if it were the final version with appropriate white space to get an accurate estimate as to its length – longer questionnaires reduce the response rate.
- Place the most important items in the first half of the questionnaire to increase response on the important measures even in partially completed surveys.
- Make sure questions flow naturally from one to another.

Contd.

- Question: How many cups of coffee or tea do you drink in a day?
- Principle: Ask for an answer in only one dimension.
- Solution: Separate the question into two –
  - (1) How many cups of coffee do you drink during a typical day?
  - (2) How many cups of tea do you drink during a typical day?

Step 5: Revise

- Shorten the set of questions for the study. If a question does not address one of your aims, discard it.
- Refine the questions included and their wording by testing them with a variety of respondents.
  - Ensure the flow is natural.
  - Verify that terms and concepts are familiar and easy to understand for your target audience.
  - Keep recall to a minimum and focus on the recent past.

Step 6: Assemble the final questionnaire

- Decide whether you will format the questionnaire yourself or use computer-based programs for assistance:
  - SurveyMonkey.com
  - Adobe Live Cycle Designer 7.0
  - GCRC assistance
- At the top, clearly state:
  - The purpose of the study
  - How the data will be used
  - Instructions on how to fill out the questionnaire
  - Your policy on confidentiality
- Include identifying data on each page of a multi-page, paper-based questionnaire such as a respondent ID number in case the pages separate.

Assemble the final questionnaire – Contd.

- Group questions concerning major subject areas together and introduce them by heading or short descriptive statements.
- Order questions in order to stimulate recall.
- Order and format questions to ensure unbiased and balanced results.

Assemble the final questionnaire – Contd.

- Include white space to make answers clear and to help increase response rate.
- Space response scales widely enough so that it is easy to circle or check the correct answer without the mark accidentally including the answer above or below.
  - Open-ended questions: the space for the response should be big enough to allow respondents with large handwriting to write comfortably in the space.
  - Closed-ended questions: line up answers vertically and precede them with boxes or brackets to check, or by numbers to circle, rather than open blanks.
- Use larger font size (e.g., 14) and high contrast (black on white).

Enhance response rate

- When writing questions and assembling the final questionnaire, edit with a view towards saliency: apparent relevance, importance, and interest of the survey to the respondent
- Consider either pre-notifying those in your sample or sending reminders to those who received the survey (if self-administered). Studies have shown that making contact with the sampled individuals increases the response rate.
- If possible, offer an incentive.

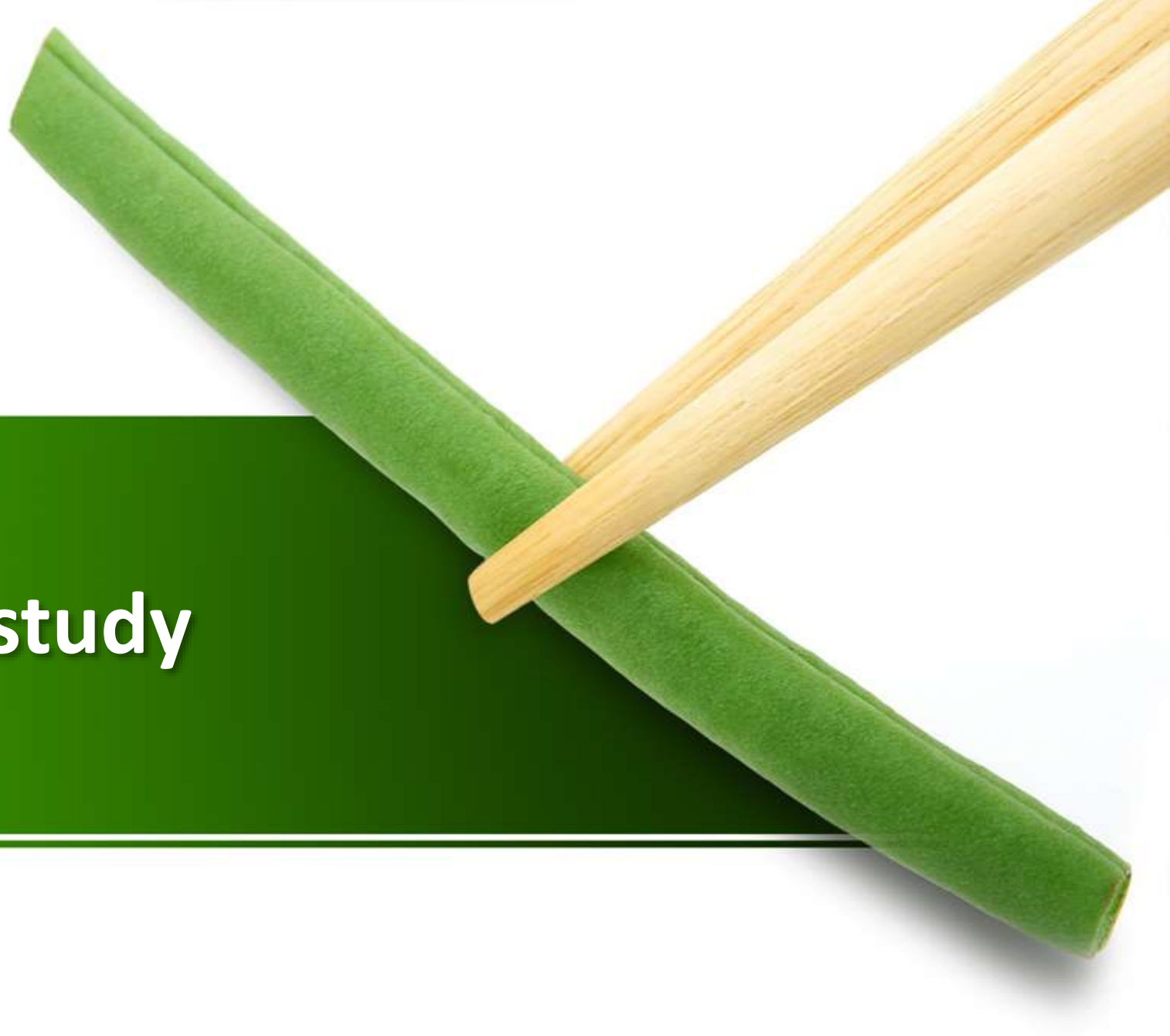
Non-responders

- Understanding the characteristics of those who did not respond to the survey is important to quantify what, if any, bias exists in the results.
- To quantify the characteristics of the non-responders to postal surveys, Moser and Kalton suggest tracking the length of time it takes for surveys to be returned. Those who take the longest to return the survey are most like the non-responders. This result may be situation-dependent.

Conclusions

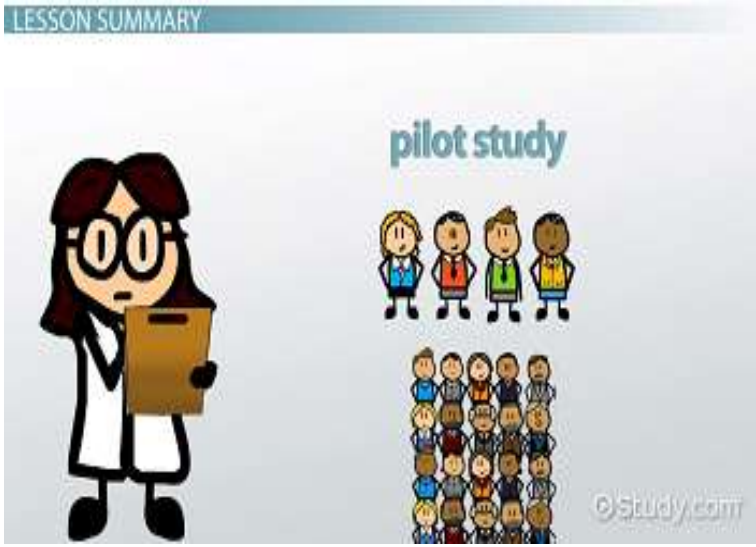
- You need plenty of ***time***!
  - Design your questionnaire from research hypotheses that have been carefully studied and thought out.
  - Discuss the research problem with colleagues and subject matter experts is critical to developing good questions.
  - Review, revise and test the questions on an iterative basis.
  - Examine the questionnaire as a whole for flow and presentation.

Pilot study



DEFINITION

- **Pilot study is a trail study carry out before a research design is finalized to assist in defining the research question or to test the feasibility, reliability, and validity of the proposed study design.**



MEANING AND CONCEPTS

- **A pilot study is a small study designed to gather information prior to a larger study, in order to improve the quality of final study.**
- **A pilot study can reveal deficiencies in the design of a proposed research proposal.**
- **A good research strategy requires careful planning & a pilot study often is a part of this strategy.**

REASONS FOR CONDUCTING A PILOT STUDY

- **Main Reasons :**

1. **Process : This assesses the feasibility of the process** that are key to the success of the main study

2. **Resources : This deals with assessing time & resource** problems that can occur during the main study.

3. **Management : This covers potential human & data** management problems.

4. **Scientific : This deals with the assessment of the** response, effect & variance of the ef**fect.**

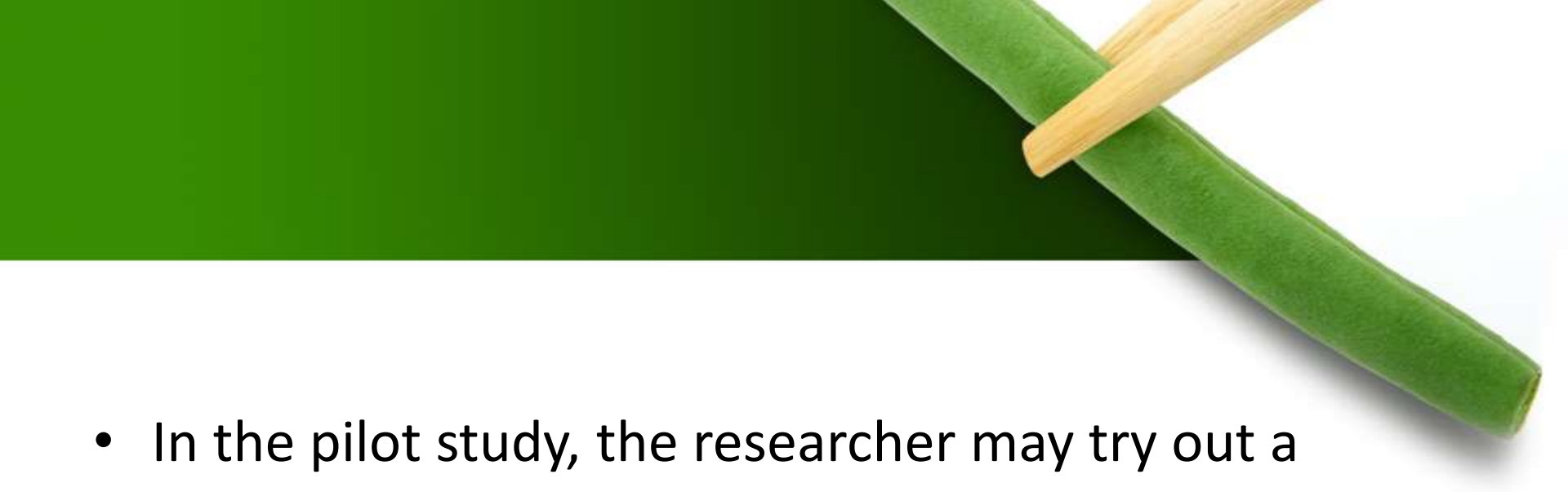
OTHER REASONS

1. Developing & testing adequacy of research instrument.
2. Assessing the feasibility of a full scale study /survey.
3. Establishing whether the sampling frame & technique are effective collecting preliminary data.
4. Determining what resources are needed for a planned study
5. Assessing the proposed data analysis techniques to uncover potential problems.
6. Developing a research question & research plan.

ADVANTAGES

- It permits preliminary testing of hypothesis that leads to testing more precise hypotheses in the main study.
- It often provides the researcher with ideas, approaches & clues the researcher may not have foreseen before conducting the pilot study.
- It may save lot of time & money.

- It permits a thorough check of the planned statistical & analytical procedures, giving a researcher a chance to evaluate their usefulness to the data.
- It can greatly reduce the number of unanticipated problems because the researcher have all opportunity to redesign parts of his/her study to overcome difficulties that the pilot study reveals.



- In the pilot study, the researcher may try out a number of alternative measures & then select those that produce the clearest results for the cleanest results for the main study.

PROBLEMS OF PIOLT STUDY

- Possibility of making inaccurate predictions or assumptions on the basis of pilot data.
- Completing a pilot study successfully is not a guarantee of the success of the full scale survey.
- A more common problem is deciding whether to include pilot study participants in the main study.

THANK YOU