WHAT IS RESEARCH DESIGN ?

Task of defining the research problem is the preparation of the research project, popularly known as the “research design".

Decisions regarding **what, where, when, how much, by what means concerning an inquiry or a research study constitute a research design.**

Meaning of research design

- A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure.

Research design have following parts

- Sampling design
- Observational design
- Statistical design
- Operational design

Sampling designs

- Which deals with the methods of selecting items to be observed for the study.

Observational design

- Which relates to the condition under which the observation are to be create.

Statistical design

- Which concern the question of the of **How the information and data gathered are to be analyzed ?**

Operational design

- Which deals with techniques by which the procedures satisfied in sampling .

Features of a good research design

A research design appropriate for a particular research problem, usually involves the following features.

- The mean of obtaining information.
- The availability and skills of the researcher and his staff, if any.
- The objective of the problem to be studied.
- The nature of the problem to be studied .
- The availability of time and money for the research work.

Important concepts relating to research design

- **Dependent and independent variables:**

  a concept which can take on different quantitative values is called a variable.

A phenomena which can take on different qualitatively values even in decimal value are called continues.

Extraneous variables

- That are not related to the purpose of the study but may effect on the dependent variables are termed as the extraneous variables

For e.g.:-

Example of this

- Suppose a researcher **want to test the hypothesis** that there is a relationship between children gains in social studies achievement and their self concept.

In this case self-concept =independent variable

Social studies achievement =dependent variable

Intelligence may as well affect on the social achievement.

But it is not related to the study undertaken by the researcher so it is a ***Extraneous variable***

Control

- One important characteristic of a good research is to minimize the influence or effect. The terminal term used when we design the study minimizing the the effect of extraneous independent variable

Conformed relationship

- When the dependent variable is not free from the influence of extraneous variable .the relationship between the depended and independent v variable is said to be confused by an extraneous variable

Research hypothesis

- The researcher hypothesis is a predicative statement that relates an independent variable to dependent variable.

Experimental and non-experimental hypothesis testing

When the purpose of research is to test a research hypothesis, it us termed as hypothesis testing research .

It can be experimental or non-expermantal

Experimental and control groups

- When a group is exposed to usual conditions, it is termed as a control group.
- But when the group is exposed to be some special condition, it is termed as Experimental group

Treatments

- The different conditions under which Experiment and control groups are put up usually referred to as treatment.

Experiment

- The process of examining the truth of a statistical hypothesis, relating to some research problem, is known as an Experiment.

E.g.:-

we can conduct an Experiment to examine the usefulness of a certain newly developed drug.

Different research design

In case of Exploratory research study

in case of descriptive and diagnostic research

In case of hypothesis -testing research studies

Research design in case of exploratory research design

- exploratory research method are also termed as formulative research studied.

The main purpose is that of formulate the research problem .three methods are

3. The survey of concerning literature
4. The experience survey
5. The analysis of ‘inside-stimulating

1.The survey of concerning literature

- This is most simple and fruitful method of formulating the research problem .

Hypothesis is taken earlier workers and their usefulness be evaluating as a basis for further

Research.

2. The experience survey

- The experience survey means the survey of people who had practical experience .
- The object is to obtain new ideas relating to the research problem.

3.The analysis of ‘inside-stimulating

- It is also a fruitful method of suggesting the hypothesis. It is particularly suitable in the areas where there is little experience to serve as a guide.

In this method the existing records may be examined .

In case of descriptive and diagnostic research

in case of descriptive research study –one those studied which are concerned with describing the characteristics of a particular

Individual , or a group.

In diagnostic research study determine the frequency which some thing occur

Difference between formulative= descriptive/diagnostic

- Flexible design
- Judgmental sampling
- No pre-determined design
- No fixed decision about the operational procedures

- No flexibility
- Random sampling
- Pre-determined design for analysis
- Advanced decisions

In case of hypothesis-testing research studies

- hypothesis-testing research studies known as experimental studies are those researcher tests the hypothesis of casual relationship between variables.

IMPORTANCE OF LITERATURE REVIEW

INTRODUCTION

- Review of literature is one of the most important steps in the research process.
- It is an account of what is already known about a particular phenomenon.
- The main purpose of literature review is to convey to the readers about the work already done & the knowledge & ideas that have been already established on a particular topic of research.
- Literature review is a laborious task, but it is essential if the research process is to be successful.

MEANING OF LITERATURE REVIEW

- A literature review uses as its database reports of primary or original scholarship & does not report new primary scholarship itself. The primary reports used in the literature may be verbal, but in the vast majority of cases, report are written documents. The types of scholarship may be empirical, theoretical, critical/analytic, or methodological in nature. Second a literature review seeks to describe, summarize, evaluate, clarify &/or integrate the content of primary reports.

…(H.M. Cooper, 1988)

Count…

- A literature review is an evaluative report of information found in the literature related to selected area of study. The review describes, summarizes, evaluates & clarifies this literature. It gives a theoretical base for the research & helps to determine the nature of research.

…(Queensland University, 1999)

- A literature review is a body of text that aims to review the critical points of knowledge on a particular topic of research.

…(ANM, 2000)

- A literature review is an account of what has been already established or published on a particular research topic by accredited scholars & researchers.

…(University of Toronto, 2001)

- Identification of a research problem & development or refinement of research questions.
- Generation of useful research questions or projects/activities for the discipline.
- Orientation to what is known & not known about an area of inquiry to ascertain what research can best contribute to knowledge.
- Determination of any gaps or inconsistencies in a body of knowledge.
- Discovery of unanswered questions about subjects, concepts or problems.
- Determination of a need to replicate a prior study in different study settings or different samples or size or different study populations.

Count…

- Identification of relevant theoretical or conceptual framework for research problems.
- Identification or development of new or refined clinical interventions to test through empirical research.
- Description of the strengths & weaknesses of design/methods of inquiry & instruments used in earlier research work.
- Development of hypothesis to be tested in a research study.
- Helps in planning the methodology of the present research study.
- It also helps in development of research instruments.
- Identification of suitable design & data collection methods for a research study.

PURPOSES OF LITERATURE REVIEW

- The purpose of a literature review is to convey to the reader previous knowledge & facts established on a topic, & their strength & weakness.
- The literature review allows the reader to be updated with the state of research in a field & any contradictions that may exist with challenges findings of other research studies.
- It helps to develop research investigative tools & to improve research methodologies.
- It also provide the knowledge about the problems faced by the previous researchers' while studying same topic.
- Besides enhancing researchers' knowledge about the topic, writing a literature review helps to:

Count…

- Place each in the context of its contribution to the understanding of subject under review.
- Describe the relationship of each study to other research studies under consideration.
- Identify new ways to interpret & shed light on any gaps in previous research.
- Resolve conflicts amongst seemingly contradictory previous studies.
- Identify areas of prior scholarship to prevent duplication of effort.
- Point a way forward for further research.
- See what has & has not been investigated.

Count…

- Develop general explanation for observed variations in a behavior or phenomenon.
- Identify potential relationship between concepts & to identify researchable hypothesis.
- Learn how others have defined & measured key concepts.
- Identify data sources that other researchers have used.
- Develop alternative research projects.
- Discover how a research project is related to the work of others.
- Place one's original work (in case of thesis or dissertation) context of the existing literature.

SOURCES OF LITERATURE REVIEW

Literature can be reviewed from two sources:

1. Primary sources
2. Secondary sources

1. Primary Sources

- Literature review mostly relies on primary sources, i.e. research reports, which are description of studies written by researchers who conducted them.
- A primary sources is written by a person who developed the theory or conducted the research, or is the description of an investigation written by the person who conducted it.
- Most primary sources are found in published literature.
- For example, a nursing research article.

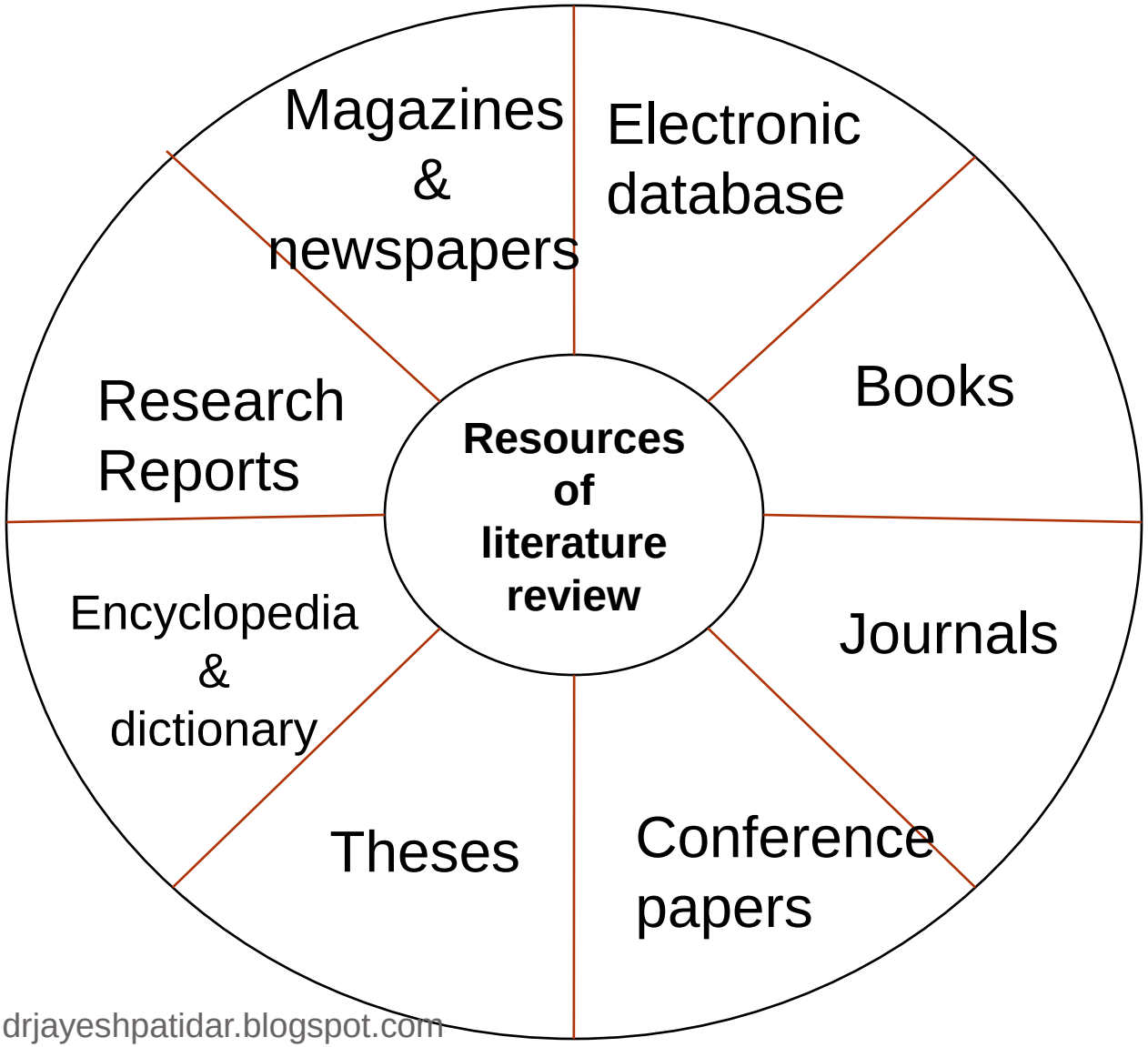
Example of a primary source: An original qualitative on patient experiences in the ICU: Hupcey, J. E. (2000). Feeling safe the psychosocial needs of ICU patients. *Journal of Nursing Scholarship*, 32:361-367.

2. Secondary Sources

- Secondary source research documents are description of studies prepared by someone other than the original researcher.
- They are written by people other than the individuals who developed the theory or conducted the research.
- The secondary sources may be used when primary sources are not available or if researchers want external opinions on an issue or problem or

Example of a Secondary Source: A literature review on patient experiences in the ICU: Stein-Parbury, J. & Mckinley, S. (2000) patient experiences of being in an intensive care unit: a select literature review. *American Journal of critical care,* 9:20-27.

The main sources from where literature can be searched are as ...



1. Electronic Sources:

- Computer-assisted literature search has revolutionized the review of literature.
- These searches, however, for a variety of reasons may not provide the desired references.
- Electronic literature search through web may be very useful, but sometimes it can be time consuming & unpredictable because there are many website & web pages that can lead to information overload & confusion.
- however, currently it is one of the most

Count…

- General literature search can be conducted through search engines like Yahoo (www.yahoosearch.com), Google (www.google.com), MSN search, Lycos, WebCrawler, Alta Vista, or Excite.
- The most relevant nursing databases are as follows:
- ***CINAHL (Cumulative Index to Nursing & Allied Health Literature):*** Accessible at http://www.cinahl.com, it citations of nursing literature published after 1988. Even full-text articles are available on CINAHL plus, a paid web page.
- ***PubMed:*** PubMed can be used to search research abstracts, available at http://pubmed.com

Count…

- ***MEDLINE (Medical Literature Analysis & Retrieved System Online):*** It is another electronic source of literature review commonly used by nurses. The National Library of Medicine provides free access to MEDLINE through PubMed, available at www.pubmed.com or http://ncbi.nih.gov/entrez/query.fcgi. generally, abstracts of research articles are provided free of cost; some of the full-text copies are also freely available & some others are available for a free.
- ***Cochrane Database of System Reviews:*** Health care-related literature can be searched from this source, available at http://www.cochrane.org.
- ERIC: The ERIC database is the largest source of education information. A free search may be carried out at http://www.eric.ed.gov

- ***Registry of Nursing Research:*** Sigma Theta Tau International Honor Society of Nursing makes this database available through its Virginia Henderson International Nursing Library. Access to this database has been redesigned & made easier for users to obtain evidence & scientific findings from more than 2,200 research article & conference abstracts. The research abstracts are searched via key words, author, & title of the research study. Free access to this database may be found at http://www.nursinglibrary.org
- ***psycINFO:*** The psycINFO database belongs to American Psychological Association, & covers literature from psychological or related disciplines. It may be searched at http://www.psychinfo.com

Count…

- ***Online Journals:*** Following are the website addresses for journals & magazines that are available online:

- http://www.nursefriendly.com/nursing/linksections/nursingjornal.html
- http://www.nsna.org
- http://www.healthweb.org
- http://www.ispub.com/ostia/index.php
- http://www.healthweb.org.browse.cfm?catergy=1727
- http://www.juns.nursing.arizona.edu
- http://www.medbioworld.com
- http://www.nursingworld.org.ojin
- http://www.eaa-knowledge.com.ojni/#
- http://www.nursingweek.com

Count…

- ***Other online databases:*** Many other online database can be searched for free by nurses from the following websites:
- http://www.aidsinfo.nih.gov (HIV/AIDS information)
- http://www.hazmap.nlm.nih.gov (information on hazardous agents)
- http://www.child.nih.gov (combined health information database)
- http://www.toxinet.nlm.nih.gov (toxicology database network)
- ***Cancer Lit (Cancer literature)***
- ***EMBASE (exerpta Medica Database)***
- ***ETOH (Alcohol & alcohol problems science database)***
- ***Health STAR (Health services technology administration & research)***
- ***Radix (Nursing managed care databse)***
- ***CD-ROM (Compact disc-read only memory) with research***

2. Printed Sources:

- Printed sources are also used for literature review.
- Printed research summary may be located from published abstracts such as *Nursing Research Abstract*, *Psychological Abstracts*, *Dissertation Abstract International,* Masters *Abstract International,* etc.
- References of the other printed sources may be located through indexes such as *cumulative Index to Nursing & Allied Health Literature*, *Nursing Studies Index*, & *Index Medicus*.
- Following are the main printed sources that can be used to review the relevant literature:

- **Journals:** There are several National & International journals which can be used to review the research-

Count…

Name of national nursing journals

- Nursing & Midwifery Research Journal
- Indian journal of Nursing Research & Midwifery
- The nursing Journal of India
- Nightingale Nursing Times
- International Journal of Nursing Education
- Indian Journal of Nursing Studies

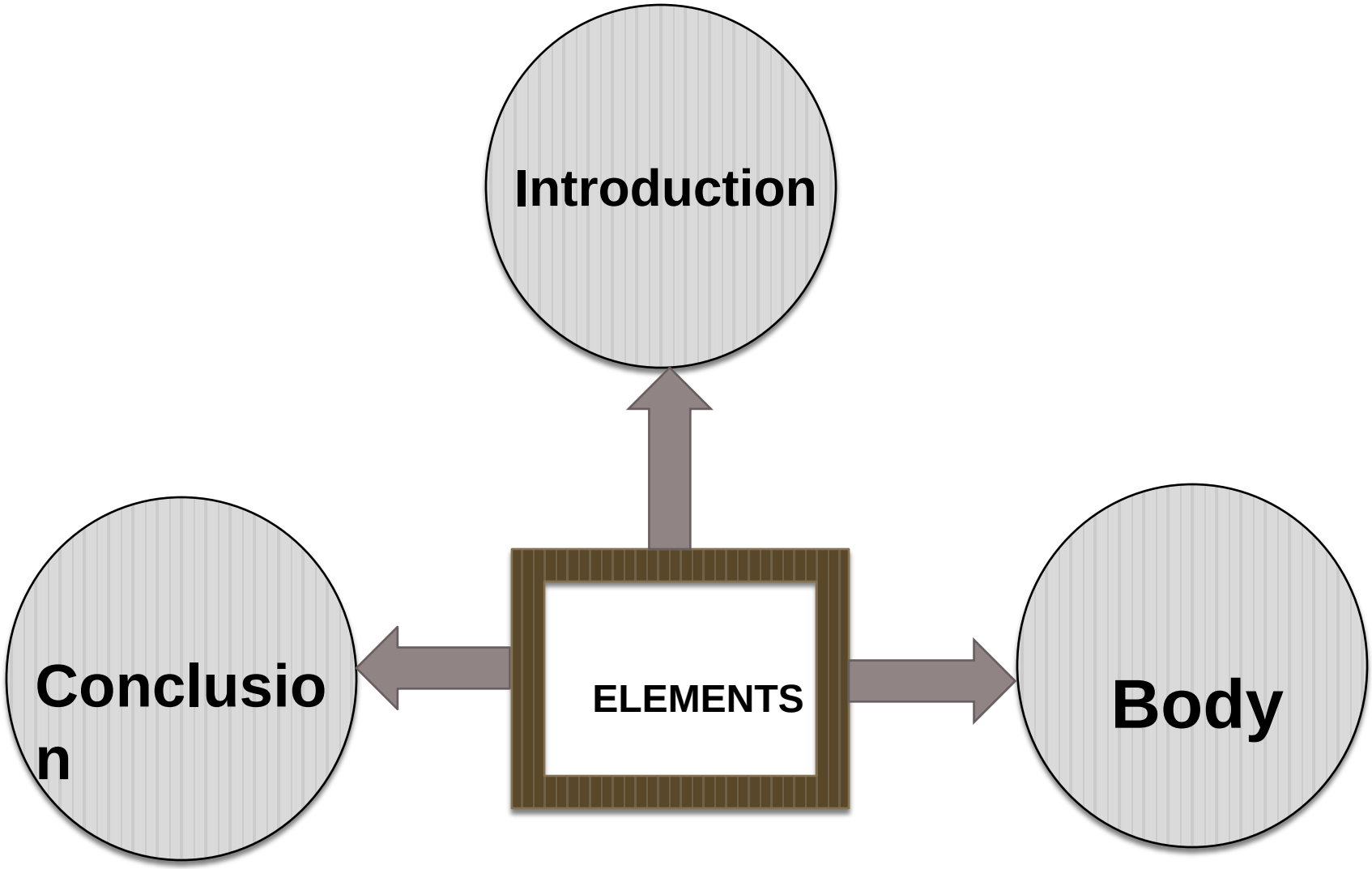
Names of international journals

- Nursing Research
- Research in Nursing & Health
- Nursing Sciences Quarterly
- Western Journal of Nursing Research
- Applied Nursing Research
- Biological Research for Nursing
- Advances in Nursing Sciences
- Clinical Nursing Research
- Worldviews on Evidence-Based Nursing
- Journal of Qualitative Research
- American Journal of Nursing

Count…

- **Research reports**
- **Unpublished dissertations & theses**
- **Magazines & newspapers**
- **Conference papers & proceedings**
- **Encyclopedias & dictionaries**
- **Books**

PREPARING WRITTEN LITERATURE


Introduction
Conclusio
n
ELEMENTS
Body

Writing the Introduction…

While writing the introduction, following steps should be taken care of:

- Define or identify the general topic, issue, or area of concern, thus, providing appropriate context for reviewing the literature.
- Point out overall trends in what has been published about the topic or conflicts in theory, methodology, evidence, & conclusion or gaps in research & scholarship, or a single problem or new perspective of immediate interest.
- Establish the writer's point of view for reviewing the literature, explain the criteria to be used in analyzing & comparing literature & organization or review (sequence), & when necessary, state why certain

Writing the Body…

Following measures need to be undertaken while writing the body of the literature.

- Group research studies & other types of literature (reviews, theoretical articles, case studies) according to common denominators such as qualitative versus quantitative approaches, conclusions of authors, specific purposes or objectives, chronology, & so on.
- Summarize individual studies or articles with as much as or as little detail as each merits according to its comparative importance in the literature, remembering that space denotes significance.
- Assist the reader with strong ‘umbrella' sentences at the beginning of paragraphs, signpost throughout, & brief ‘so what’ summary sentences at intermediate points in

Writing the Conclusion…

The points to be taken care of in the conclusion are as follows:

- Summarize major contributions of significant studies & articles to the body of knowledge under review, maintaining the focus established in the introduction.
- Evaluate the current ‘state of the art’ for the body of knowledge reviewed, pointing out major methodological flaws or gaps in research, inconsistencies in theory, & finding & areas or issues pertinent to future study.
- Conclude by providing some insight into the relationship between central topic of the literature

Example…

Example of a bad review

Sexual harassment has many consequences. Adams, Kottke, & Padgitt (1983) found that some women students said that they avoided taking a class or working with certain professors because of the risk of harassment. They also found that men & women students reacted differently. Their research was conducted through a survey of 1,000 men & women graduate & undergraduate students. Benson & Thomson's study in *social Problem* (1982) lists many problems created by sexual harassment. In their excellent book, the Lecherous Professor, Dziech & Weiner (1990) give a long list of difficulties that victims have suffered.

Example of a better review

The victims of sexual harassment suffer a range of consequences, from lowered self-esteem & loss of self-confidence to withdrawal from social interaction, changed career goals, & depression (Adams, Kottke, & Padgitt, 1983; Benson & Thomson, 1982; Dziech & Weiner, 1990). For example, Adams, Kottke, & Padgitt (1983) noted that 13% of women students said that they avoided taking a class or working with certain professors because of the risk of harassment.

POINTS TO BE CONSIDERED FOR LITERATURE REVIEW

- ***Be specific & be succinct:***

  Briefly state specific findings listed in an article, specific methodologies used in a study, or other important points. Literature reviews are not the place for long quotes or in-depth analysis of each point.

- ***Be selective:***

  Researcher should narrow down a lot of information into a small space for literature review. Just the most important points (i.e. those most relevant to the review's focus) must be mentioned in each work of review.

- ***Focus of current topics:***

  Researcher needs to analyse points such as if it is a current article, & if not, how old it is: has its claims, evidence, or arguments been superseded by more recent work; if it is not current, then if it is important for historical background ; etc.

Count…

- ***Ensure evidence for claims:***

  Researcher should focus on what support is given for claims made in literature. What evidence & what type (experimental, statistical, anecdotal, etc.) of evidences are offered? Is the evidence relevant & sufficient? What arguments are given? What assumptions are made, & are they warranted?

- ***Focus on sources of evidences:***

  Researchers should ensure the reliability of the sources of the evidence or other information – if they are from author's own experiments, surveys, historical records, government documents, etc. He should check how reliable those sources are.

Count…

- ***Account of contrary evidences:***

  Does the author take into account contrary or conflicting evidence & arguments? How does the author address disagreements with other researchers?

- ***Reference citation:***

  Any references cited in the literature review must be included in the bibliography. The common practice is that the reviewer does not list references in the bibliography that are not directly cited in the literature review or elsewhere in the paper /thesis.

- ***Avoid abbreviations:***

  Avoid technical terms, jargons & abbreviations.

- ***Simple & accurate sentence structure:***

  A researcher should use simple sentences & must avoid errors of grammar & punctuation

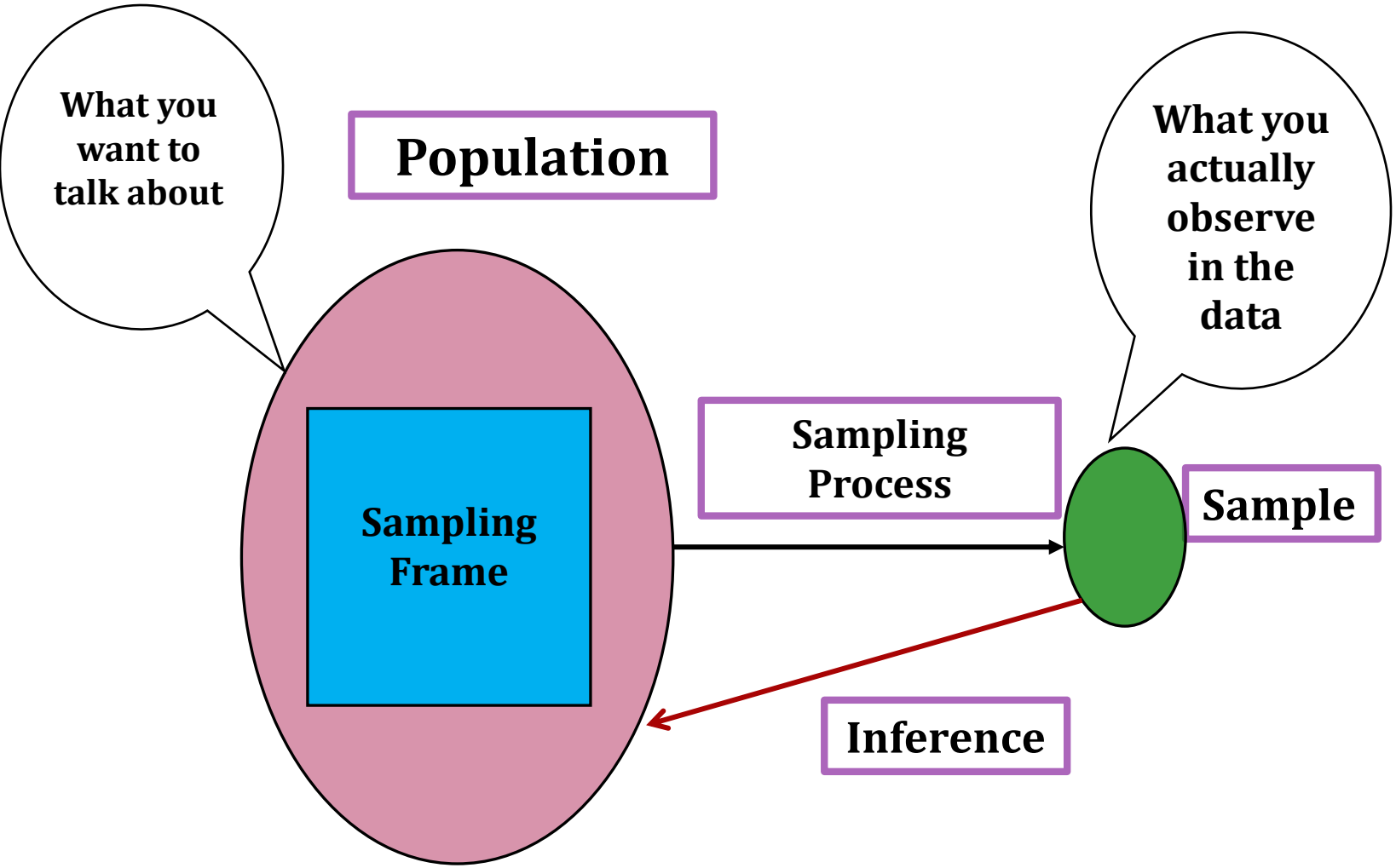
- ***Organization of literature review:***

  A literature review is organized by subtopic, not by individual references. In a typical literature review, the writers may cite several references in the same paragraph & may cite the same reference in more than one paragraph, if that source address more than one of the subtopics in the literature review. Typically, discussion of each sources is quite brief. The contribution the present reviewers make is organizing the ideas from the sources into a cogent argument or narrative that includes their perspectives.

- ***Referring original source:***

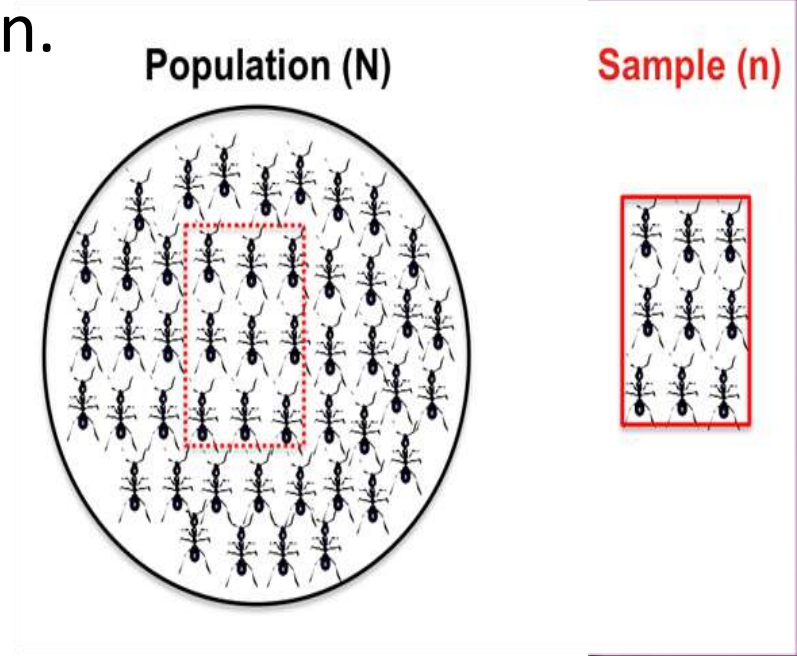
  The reviewer should focus on citing the material that originates with each reference. This may require a careful reading of the reference. If the reference author refers to another source whose ideas are relevant or interesting, it is better to track & use that original reference.

SAMPLING


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

INTRODUCTION

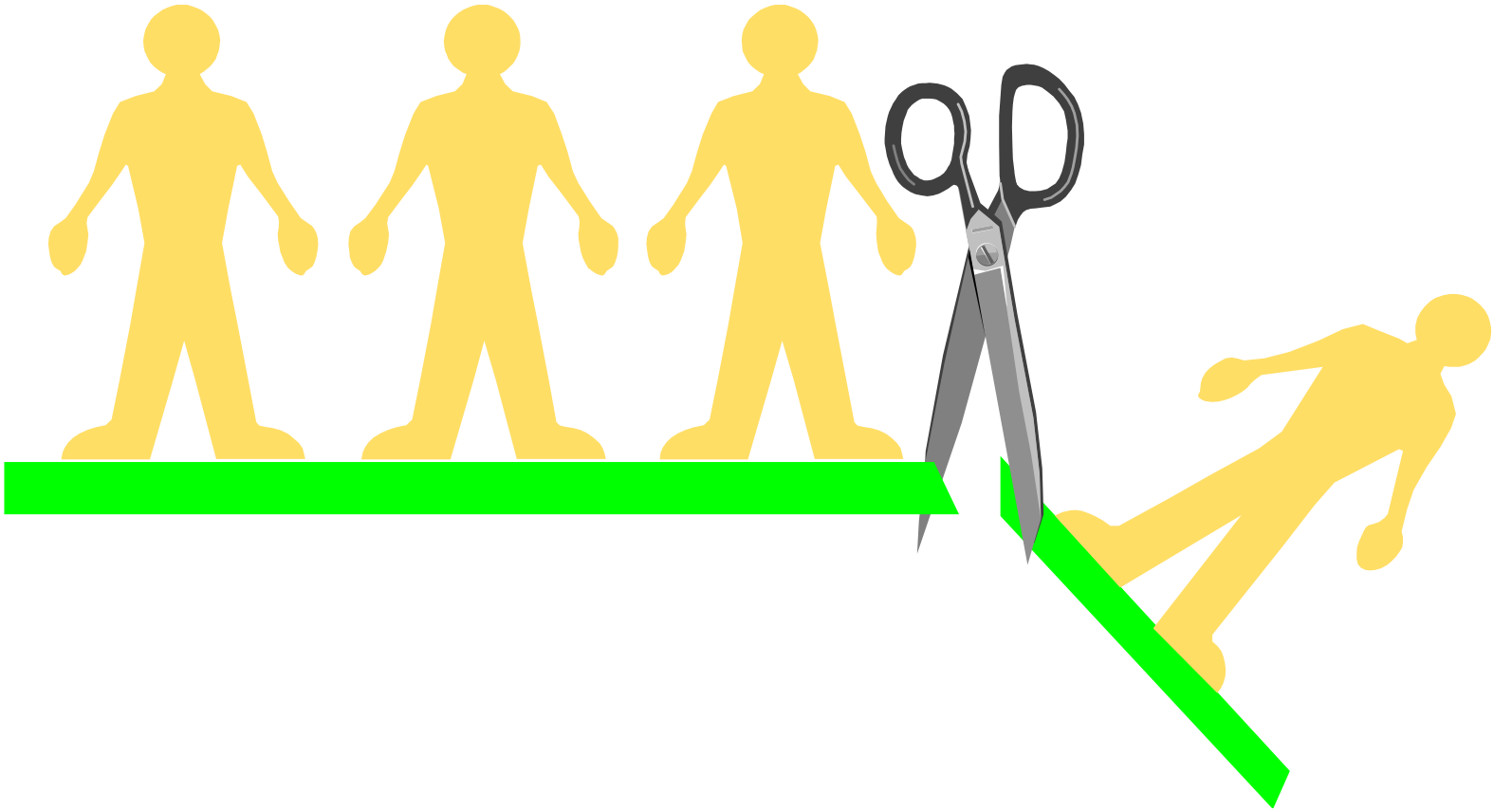
Sampling is the process of selecting observations (a sample) to provide an adequate description and inferences of the population.



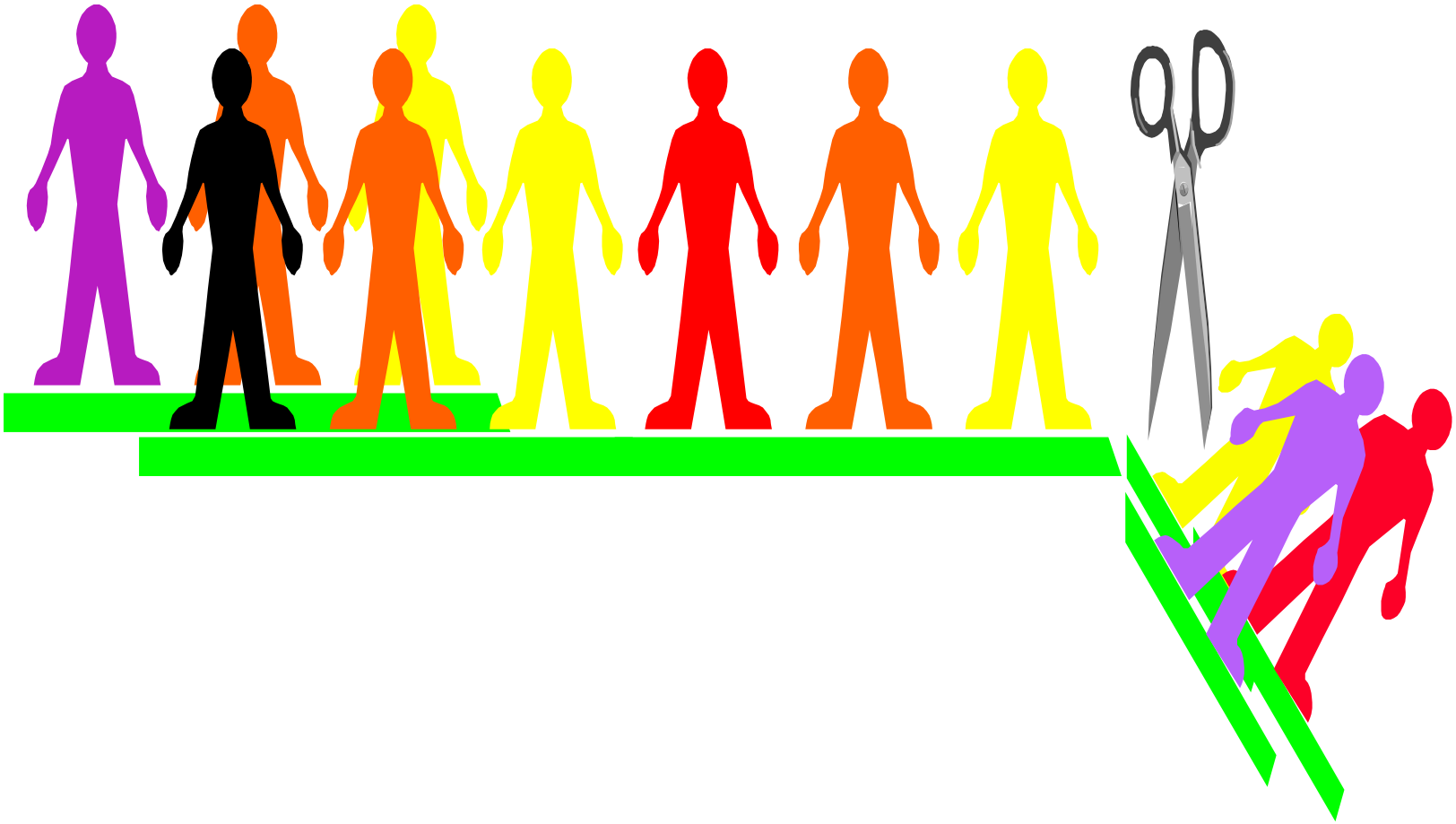
- Sample
  - It is a unit that is selected from population
  - Represents the whole population
  - Purpose to draw the inference
- Why Sample???
- Sampling Frame

  Listing of population from which a sample is chosen

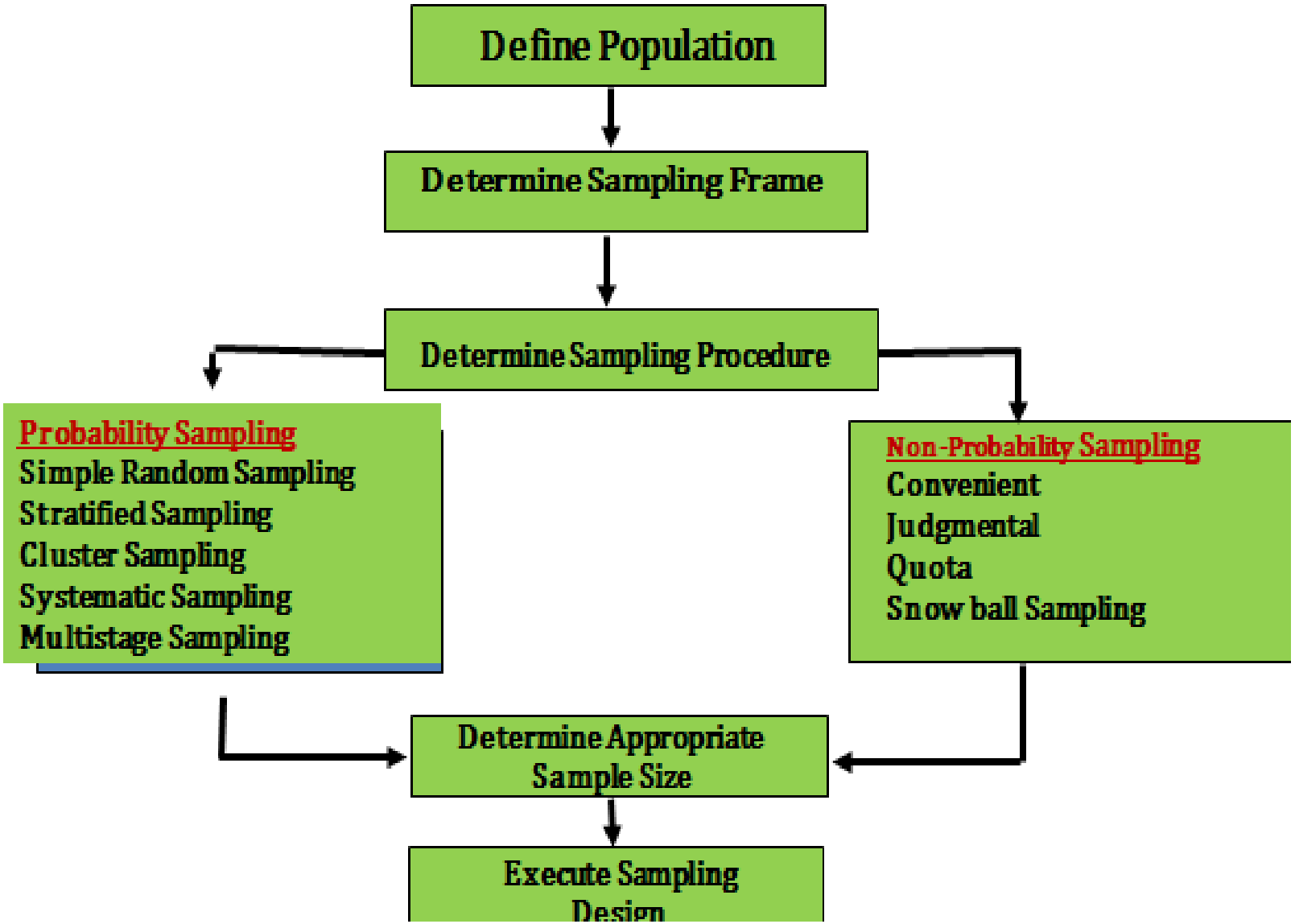
IF THE POPULATION IS HOMOGENEOUS



IF THE POPULATION IS HETEROGENEOUS



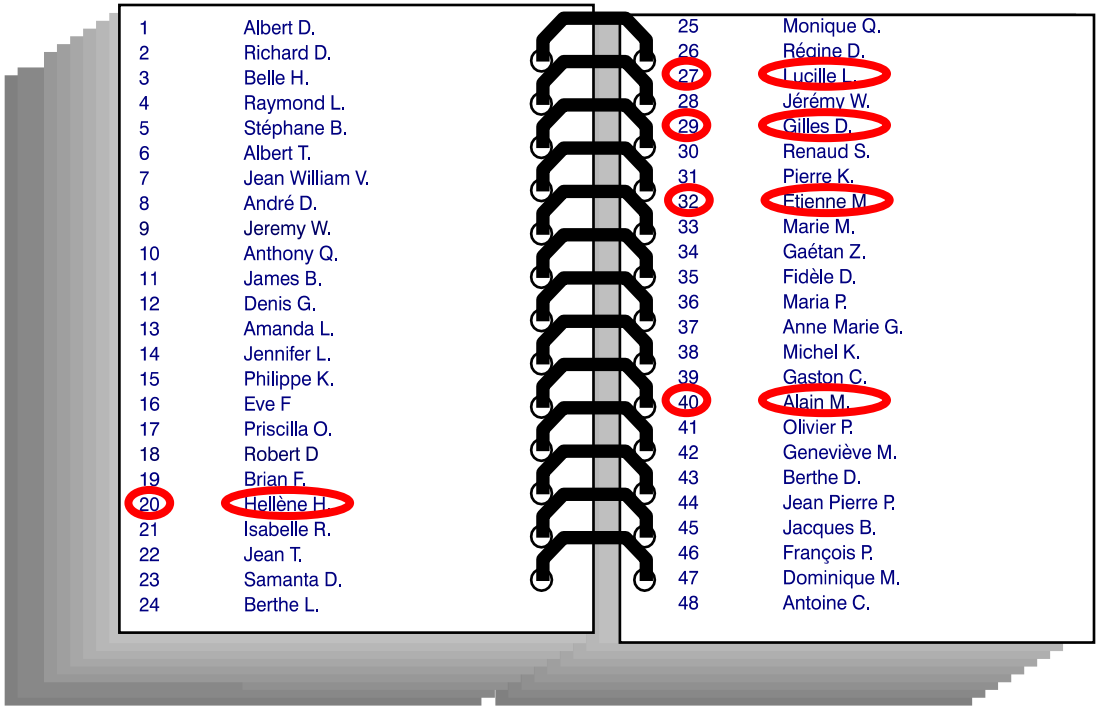
SAMPLING DESIGN PROCESS



PROBABILITY SAMPLING

SIMPLE RANDOM SAMPLING

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



SIMPLE RANDOM SAMPLING

Advantages:

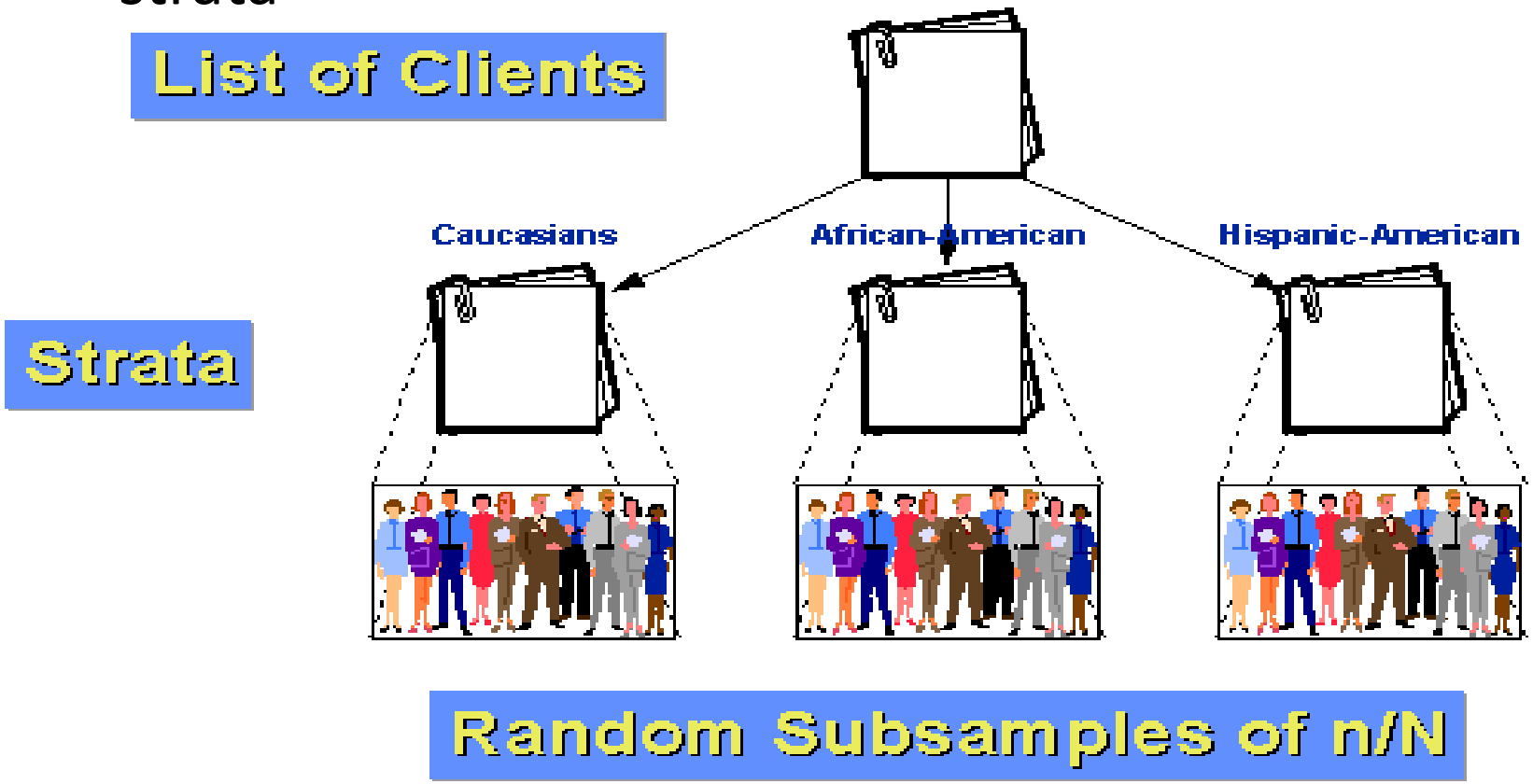
- Minimal knowledge of population needed
- Easy to analyze data

Disadvantages:

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

STRATIFIED RANDOM SAMPLING

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



STRATIFIED RANDOM SAMPLING

Advantages:

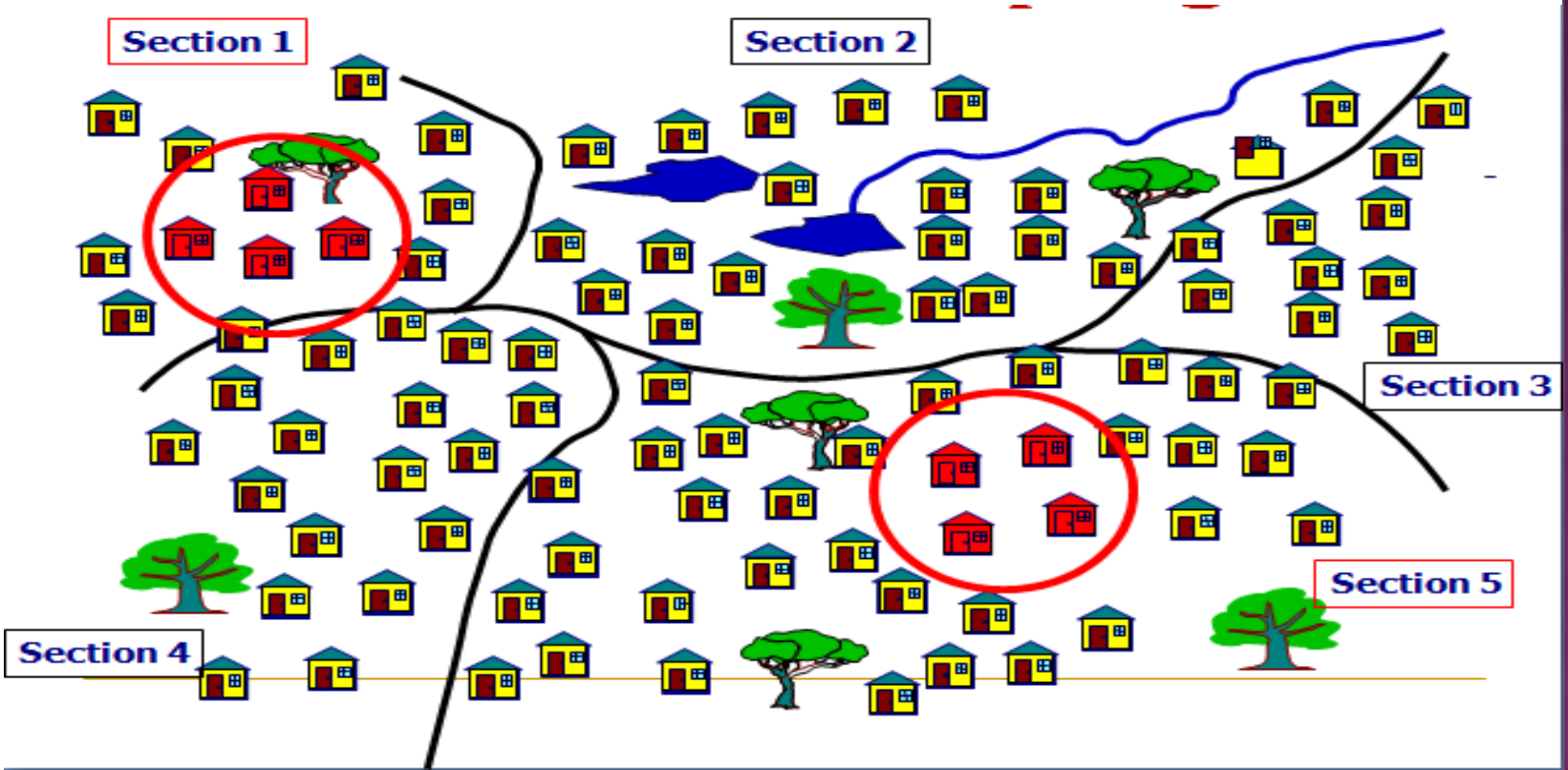
- Assures representation of all groups in sample population
- Characteristics of each stratum can be estimated and comparisons made

Disadvantages:

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

CLUSTER SAMPLING

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



CLUSTER SAMPLING

Advantages:

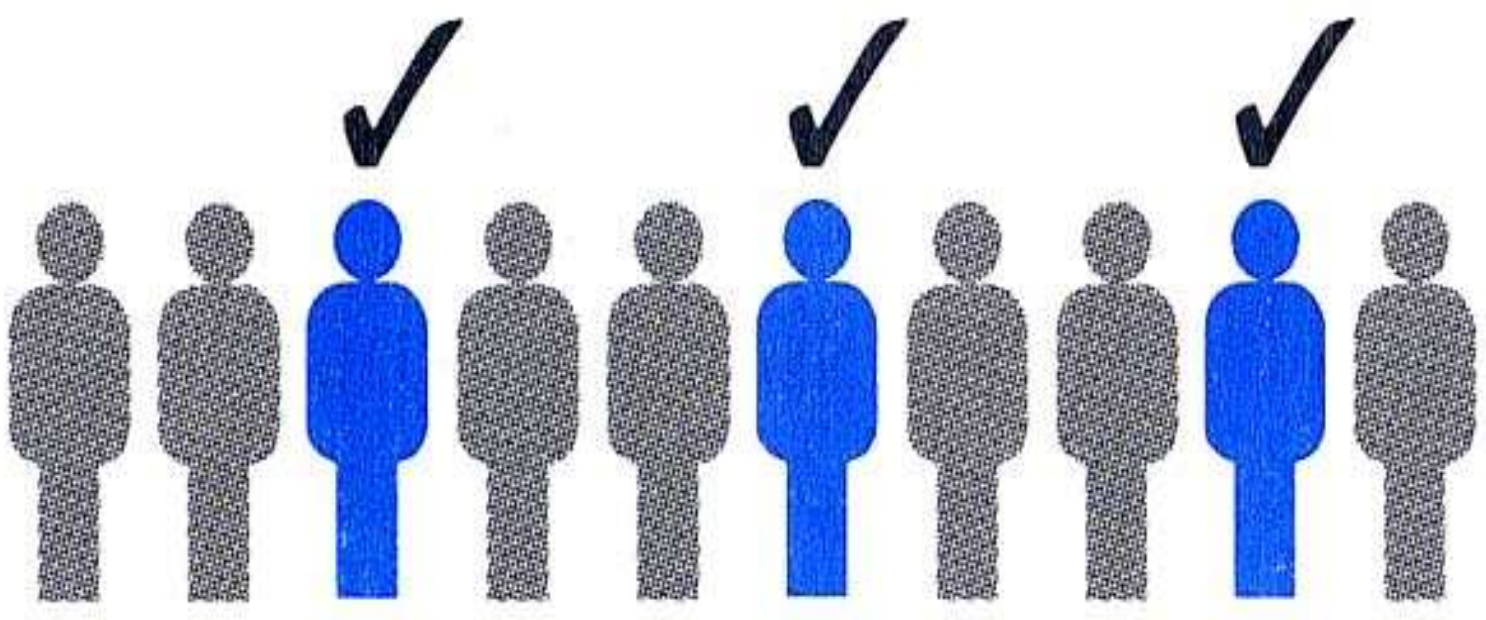
- Can estimate characteristics of both cluster and population

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 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:

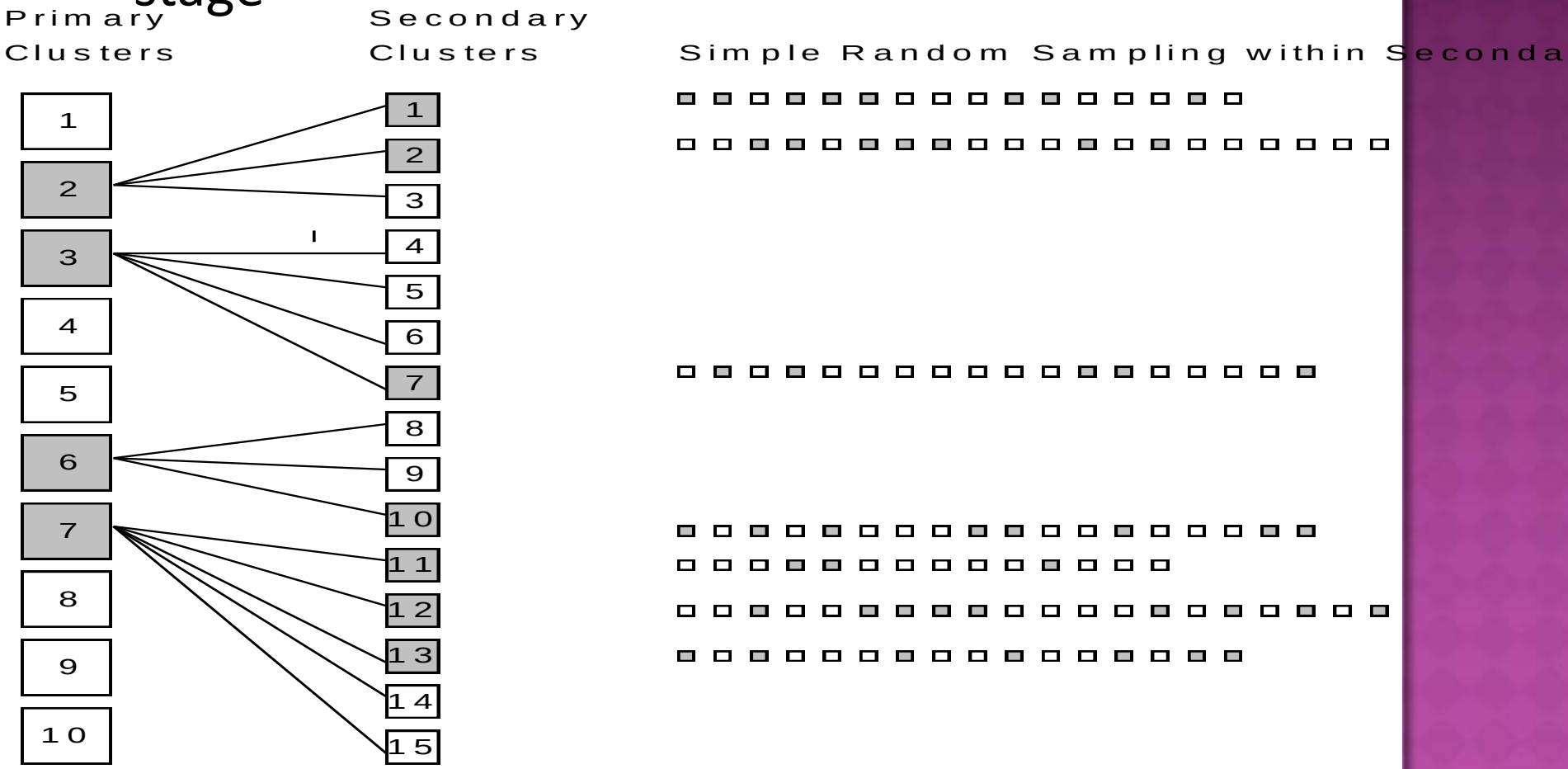
- Moderate cost; moderate usage
- Simple to draw sample
- Easy to verify

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 the 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

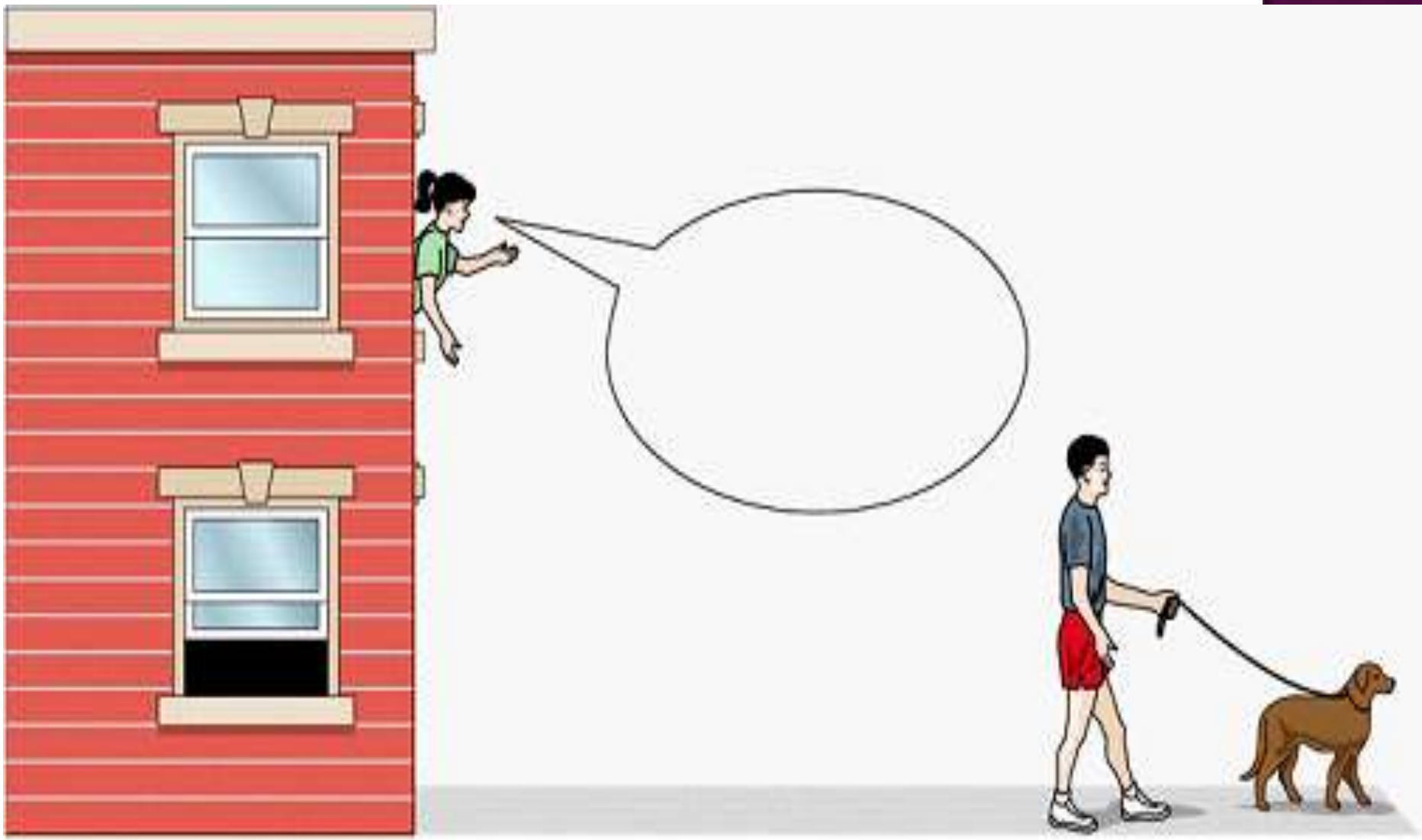
- Convenience sampling involves choosing respondents at the convenience of the researcher.

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

- 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. 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

- 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

SAMPLING ERRORS

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.

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