



FirstRanker.com

FirstRanker's choice

www.FirstRanker.com

www.FirstRanker.com

Sampling

Module 3

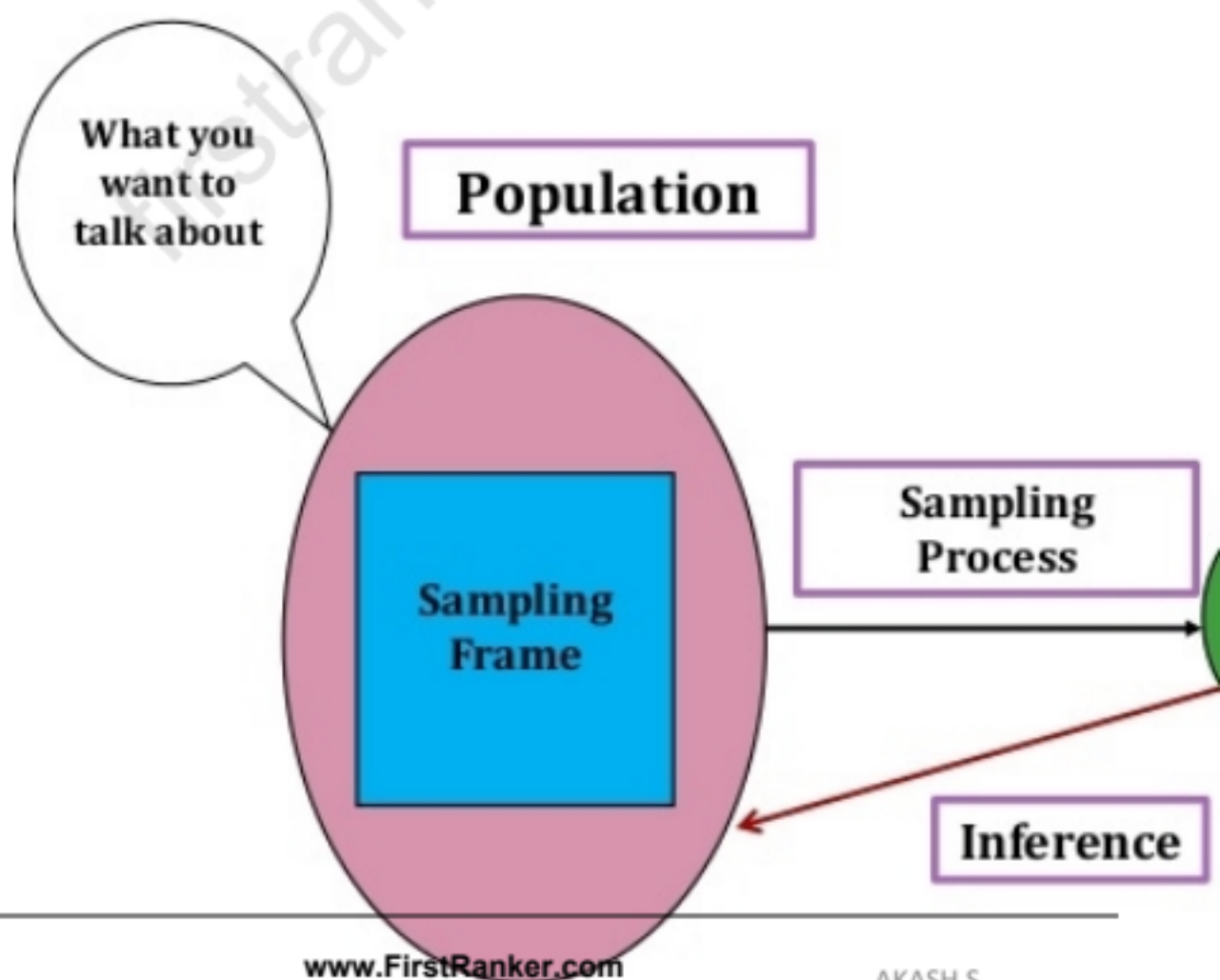
INTRODUCTION

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



SAMPLING





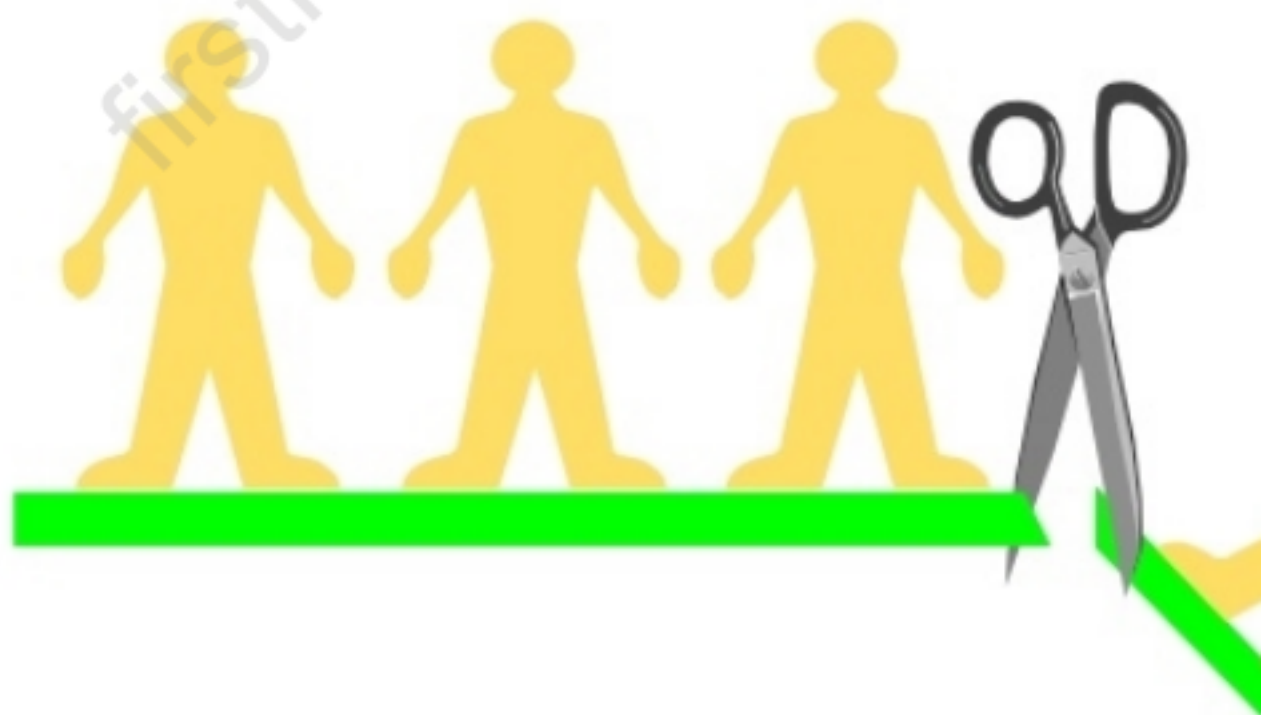
FirstRanker.com

FirstRanker's choice

www.FirstRanker.com

www.FirstRanker.com

IF THE POPULATION HOMOGENEOUS





FirstRanker.com

FirstRanker's choice

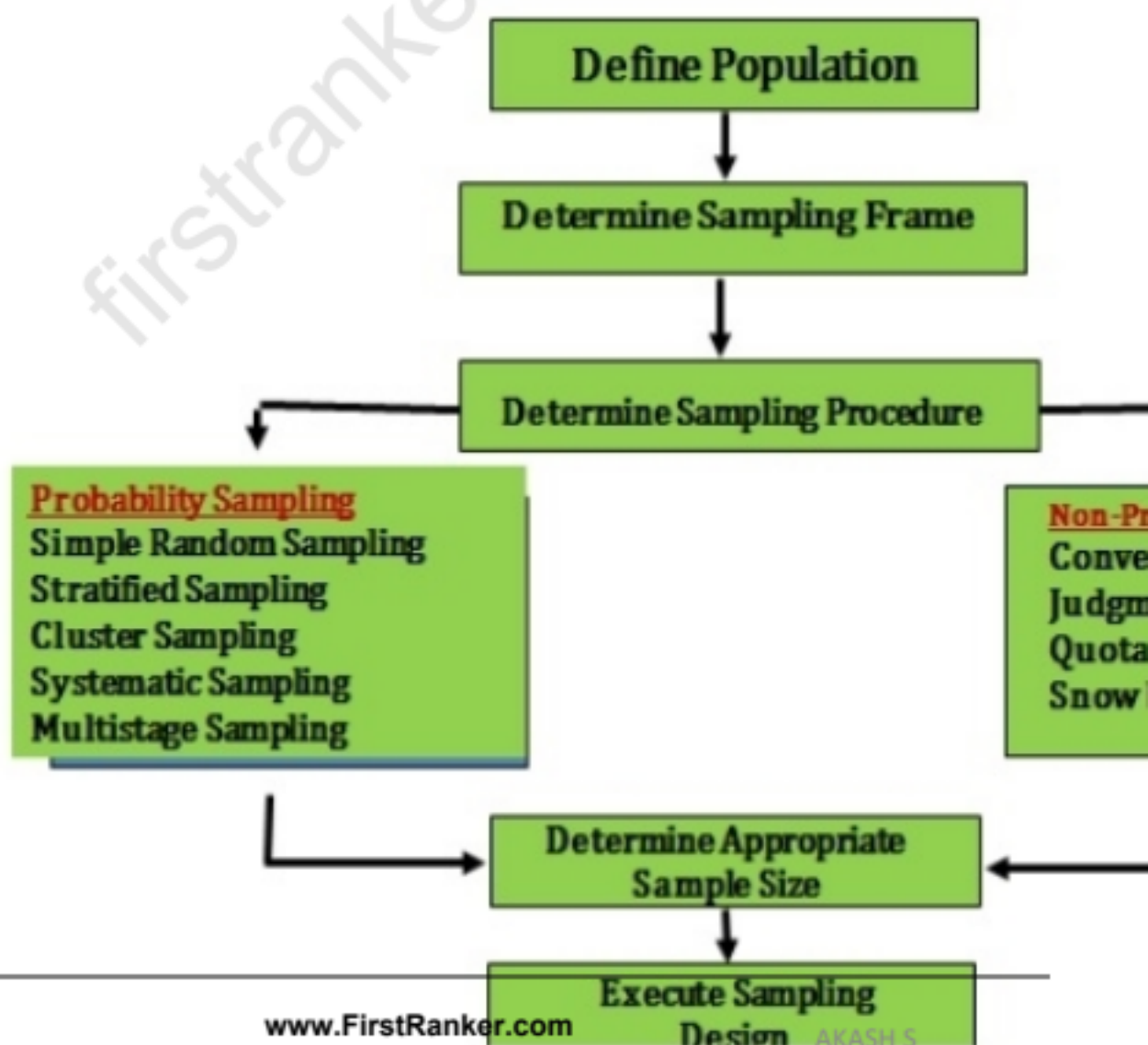
www.FirstRanker.com

www.FirstRanker.com

IF THE POPULATION HETEROGENEOUS



SAMPLING DESIGN PR





(i) Type of universe/Population

- The first step in developing any sample design is to identify the universe of objects, technically called the Universe, to be studied.
- The universe can be finite or infinite.
- In finite universe the number of items is certain and finite, whereas in infinite universe the number of items is infinite,

The population of a city, the number of workers in a factory, the number of students in a school are examples of *finite universes*,

whereas the number of stars in the sky, listeners of a radio programme, throwing of a dice etc. are examples of *infinite universes*.

2. Sampling frame

- 'Sampling Frame' is from which sample is to
- It contains the names of all items of a universe (universe only).
- If source list is not available, researcher has to create one. It should be comprehensive, correct, reliable and accurate. It is extremely important for the source list to be as close to the population as possible.
- if you want to learn about scooter owners in a city, you need to have a list of scooter owners in the frame..

(iii) Sampling unit:

- A decision has to be taken concerning selecting sample.
- Sampling unit may be a geographical one, village, etc., or
- A construction unit such as house, flat, etc., such as family, club, school, etc., or it may be
- The researcher will have to decide one or more units to select for his study.

(iv) Size of sample:

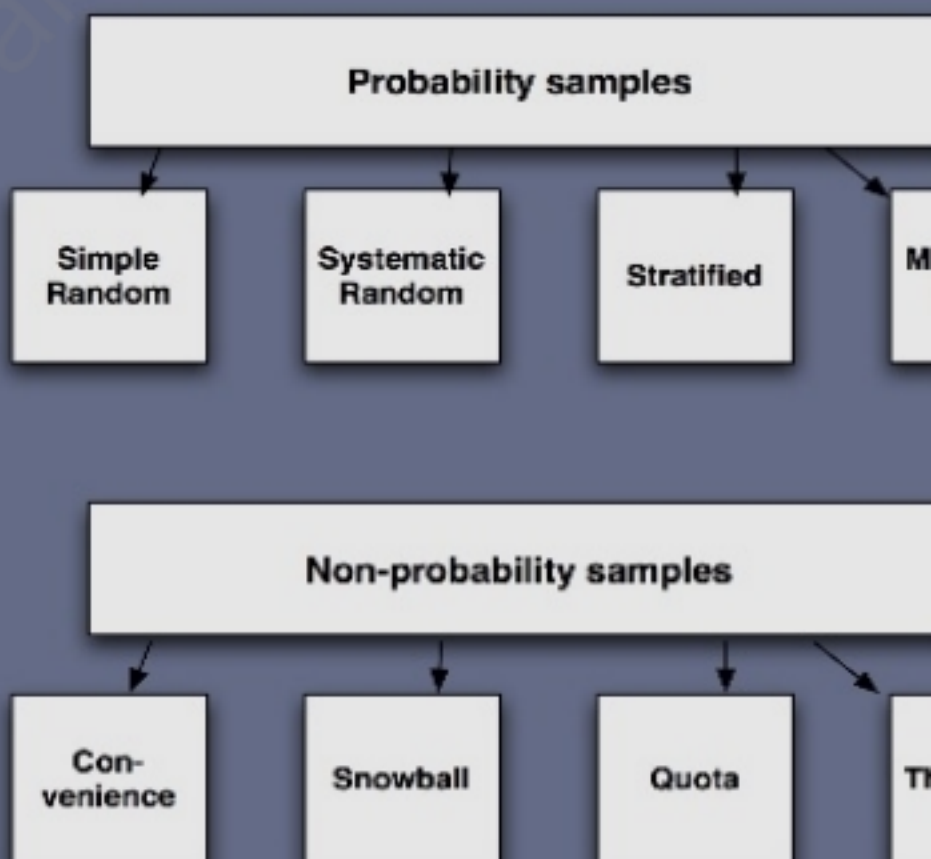
- This refers to the number of items to be selected to constitute a sample. This is a major problem because
- The size of sample should neither be excessive



(vii) Sampling procedure:

- Finally, the researcher must decide the type
- i.e., he must decide about the technique to be used for selecting items for the sample.
- Probability
- Non-Probability

Types of samples



firstranker.com

PROBABILITY SAMPLING

SIMPLE RANDOM SAMPLING

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

1	Albert D.	25	Monique G.
2	Richard D.	26	Réjane D.
3	Belle H.	27	Lucille I.
4	Raymond L.	28	Jérôme W.
5	Stéphane B.	29	Gilles D.
6	Albert T.	30	Renaud S.
7	Jean William V.	31	Pierre K.
8	André D.	32	Chérise M.
9	Jeremy W.	33	Marie M.
10	Anthony G.	34	Gaëtan Z.
11	James B.	35	Fiddle D.
12	Denis G.	36	Maria P.
13	Amanda L.	37	Anne Marie G.
14	Jennifer L.	38	Michel K.
15	Philippe K.	39	Gaston C.
16	Eve F.	40	Alan M.
17	Priscilla O.	41	Olivier P.
18	Robert D.	42	Geneviève M.
19	Brian F.	43	Berthe D.
20	Hélène H.	44	Jean Pierre P.
21	Isabelle R.	45	Jacques B.
22	Jean T.	46	François P.
23	Samanta D.	47	Dominique M.
24	Berthe L.	48	Antoine C.

SIMPLE RANDOM SAMPLING

Advantages:

- ⦿ Minimal knowledge of population needed
- ⦿ Easy to analyze data

Disadvantages:

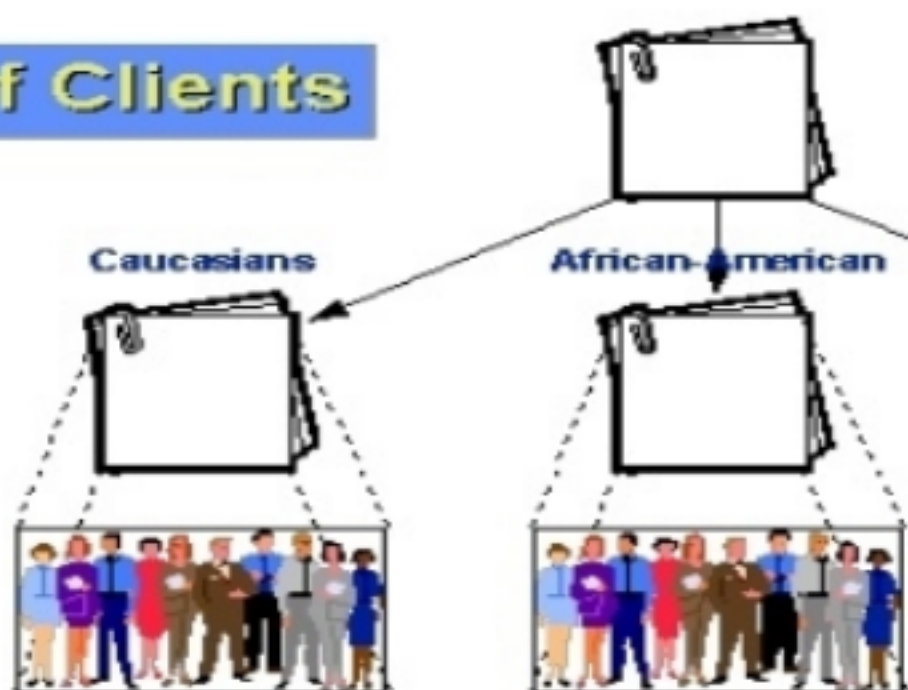
- ⦿ Low frequency of use
- ⦿ Does not use researchers' expertise
- ⦿ Larger risk of random error

STRATIFIED RANDOM SAMPLING

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

List of Clients

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 or clusters, such as families.
- A simple random sample is taken from the clusters.



CLUSTER SAMPLING

Advantages:

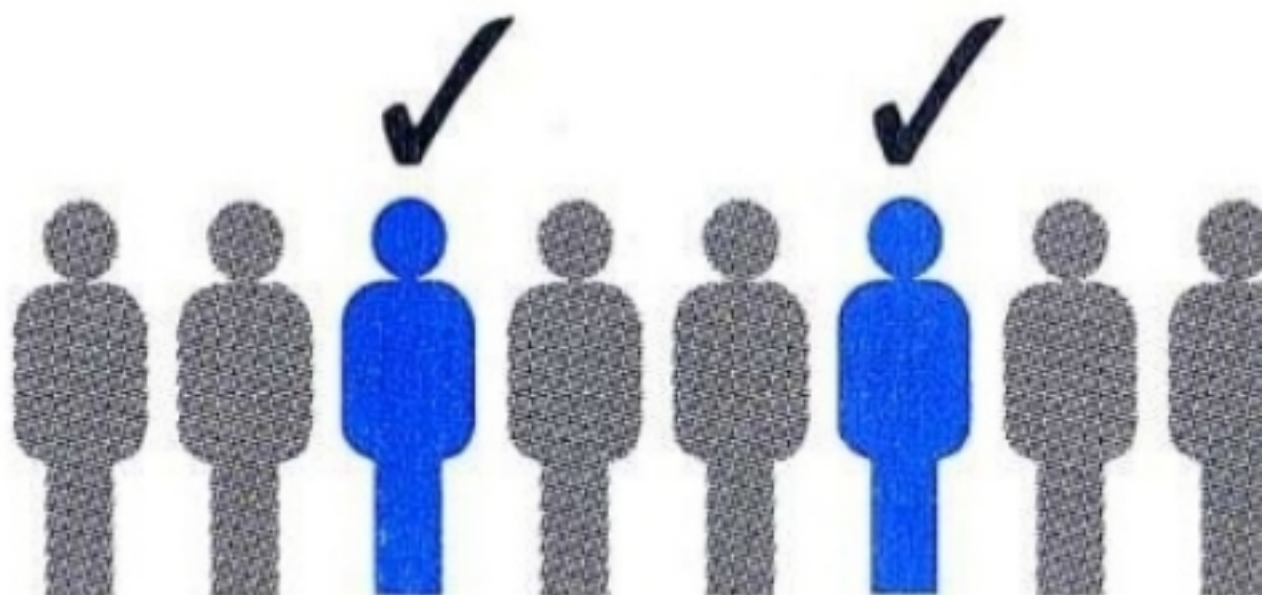
- Can estimate characteristics of both sample and population

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 n th number on the list is
- $N = \text{Sampling Interval}$



SYSTEMATIC RANDOM SAMPLING

Advantages:

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

Disadvantages:

- ⦿ Periodic ordering required

firstranker.com

NONPROBABILI SAMPLES

NONPROBABIL 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 S

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

A. CONVENIENCE SAMPLING

- ⊙ Convenience sampling involves choosing samples at the convenience of the researcher.

Advantages

- ⊙ Very low cost
- ⊙ Extensively used/understood

Disadvantages

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

B. QUOTA SAMPLING

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

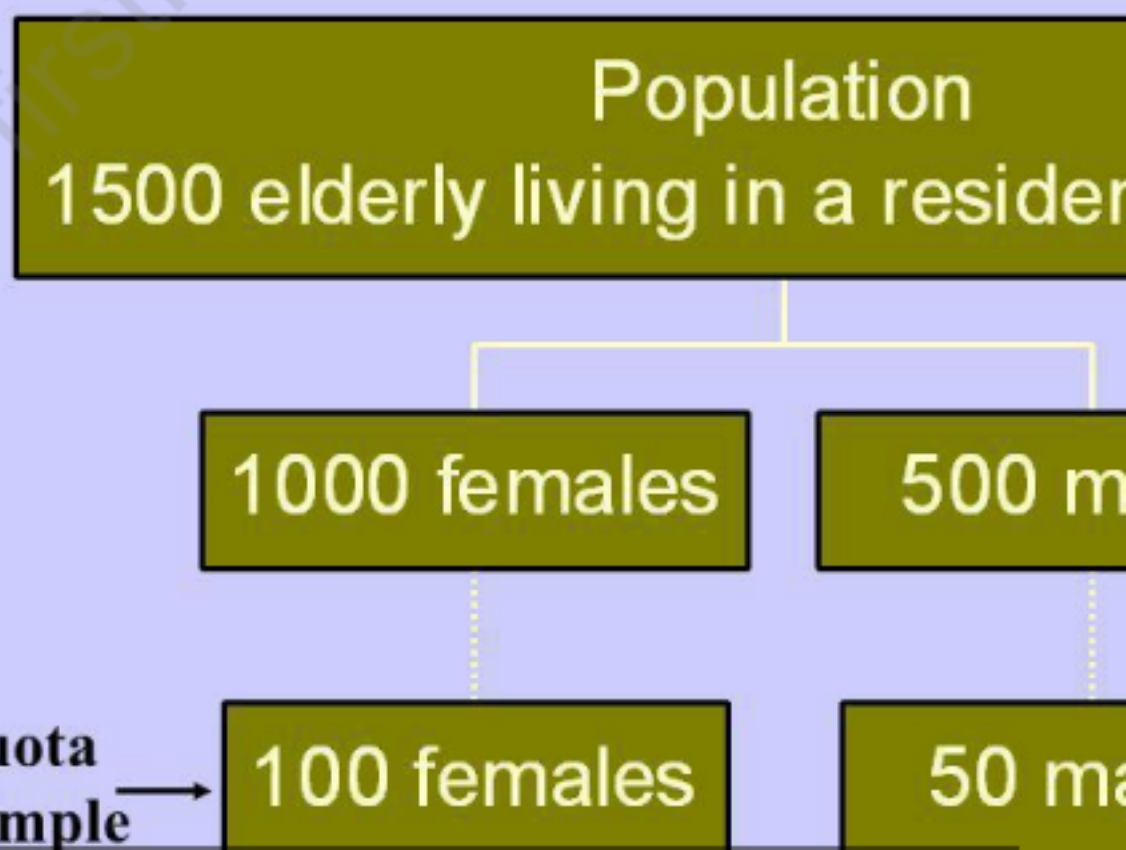
Advantages

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

Disadvantages

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

Quota Sampling - E





Quota Vs Stratified Sampling

<u>QUOTA SAMPLING</u>	<u>STRATIFIED SAMPLING</u>
In Quota Sampling, interviewer selects first available subject who meets criteria: is a convenience sample.	In Stratified Sampling, selection is random. It is used to get a representative sample.

C. JUDGEMENTAL SAMPLING

- ⦿ Researcher employs his or her own 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 SAM

A snowball sample is one in which the researcher contacts a few members of the target population he or she can then ask those individuals to provide information needed to identify other members of that population whom they know.

Advantages

- ◉ Low cost
- ◉ Useful in specific circumstances & for hard-to-reach populations

Disadvantages

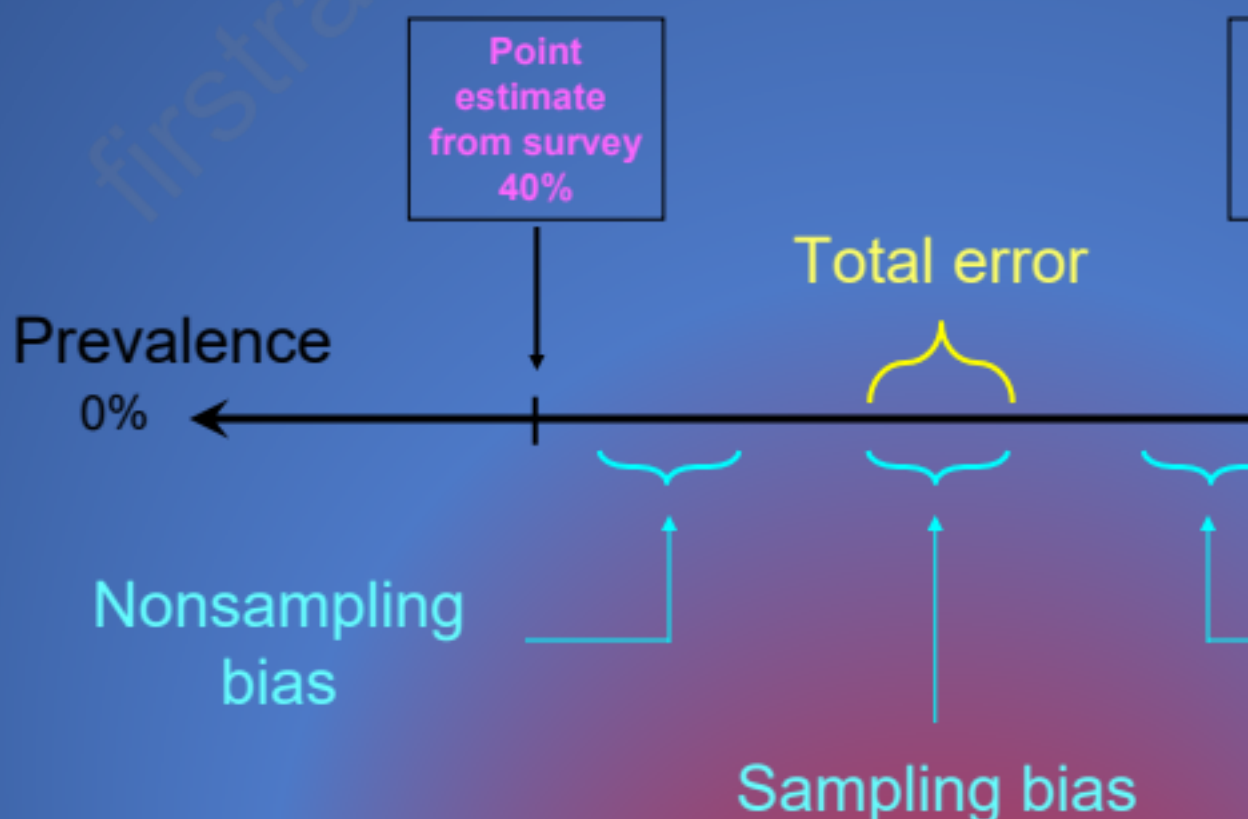
- ◉ Not independent
- ◉ Projecting data beyond sample not valid



SAMPLING ERR



Components of total error





Types of Sampling

❖ **Sample Errors**

❖ **Non Sample Errors**



Sample Error

- ❖ Error caused by the act of taking a sample
- ❖ They cause sample results to be different from the results of census
- ❖ Differences between the sample and the population that exist only because of the chance that happened to be selected for the sample
- ❖ Statistical Errors are sample errors
- ❖ We have no control over



Non Sample Error

Not Control by Sample Size

❖ Non Response Error

❖ Response Error



Non Response

A non-response error occurs when units selected as part of a sampling procedure do not respond or in part

Response Error

A response or data error is any error that occurs during data collection or interpretation

- ❖ Respondent error (e.g., lying, forgetting)
- ❖ Interviewer bias
- ❖ Recording errors
- ❖ Poorly designed questionnaires
- ❖ Measurement error



Respondent

- ❖ respondent gives an incorrect answer or competence implications, or due to undesirability of question
- ❖ respondent misunderstands the requirement
- ❖ lack of motivation to give an accurate answer
- ❖ “lazy” respondent gives an “average” answer
- ❖ question requires memory/recall
- ❖ proxy respondents are used, i.e. someone other than the respondent



Interviewer

- ❖ Different interviewers administer interviews in different ways
- ❖ Differences occur in reactions to different interviewers, e.g. to own sex or own ethnic group
- ❖ Inadequate training of interviewers
- ❖ Inadequate attention to the selection of interviewers
- ❖ There is too high a workload for



Measurement Error

- ❖ The question is unclear, ambiguous or has no answer
- ❖ The list of possible answers suggests that the instrument is incomplete
- ❖ Requested information assumes knowledge that is unfamiliar to the respondent
- ❖ The definitions used by the survey differ from those used by the respondent (e.g. how many employees do you have? See next slide)

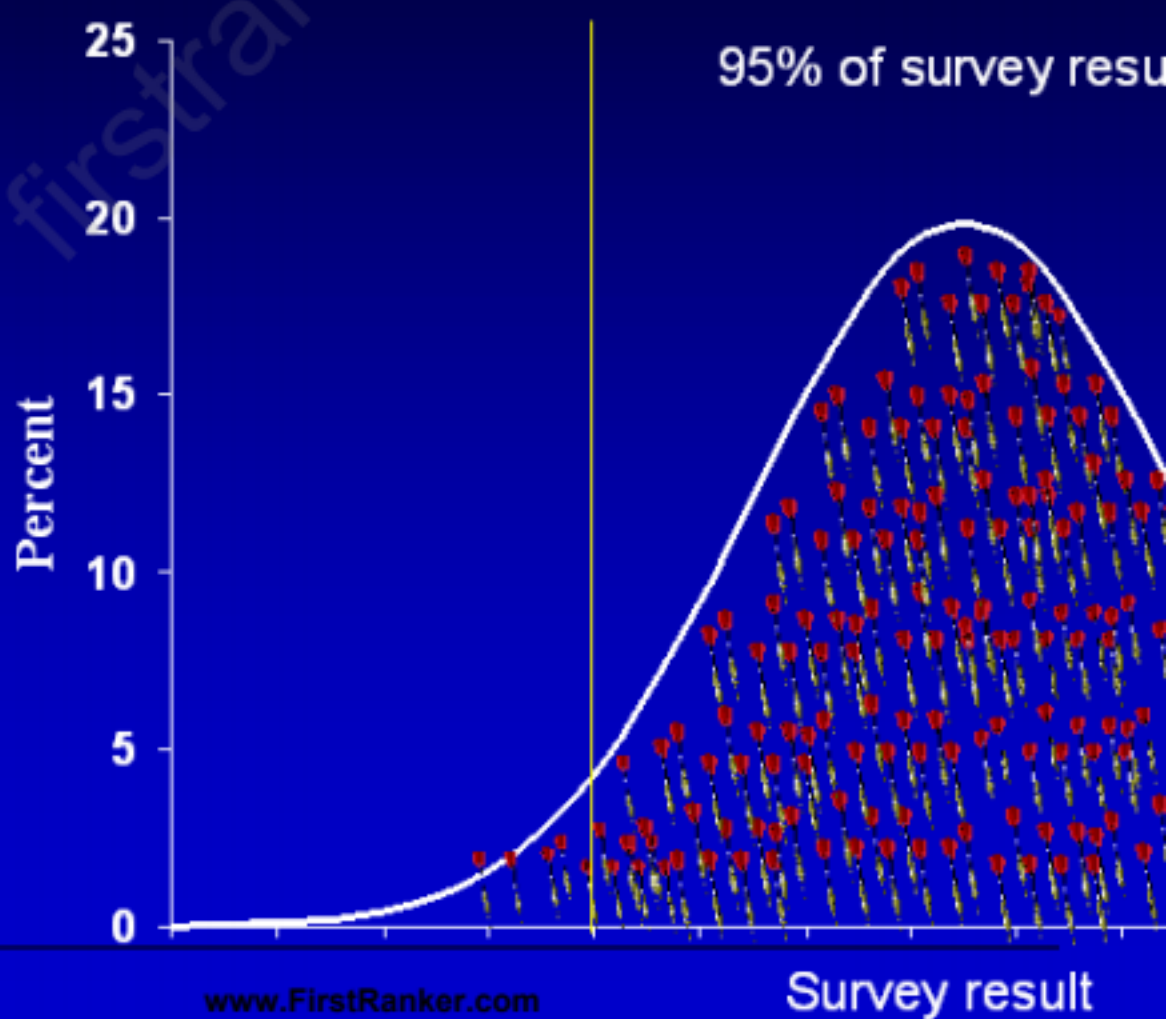
METHODS OF REDUCING SAMPLING ERROR

- ⦿ Specific problem selection.
- ⦿ Systematic documentation of related literature.
- ⦿ Effective enumeration.
- ⦿ Effective pre testing.
- ⦿ Controlling methodological bias.
- ⦿ Selection of appropriate sampling technique.

NON-SAMPLING ERROR

- ⦿ Non-sampling errors refers to biases mistakes in selection of sample.
- ⦿ **CAUSES FOR NON-SAMPLING ERROR**
 - Sampling operations
 - Inadequate of response
 - Misunderstanding the concept
 - Lack of knowledge
 - Concealment of the truth.
 - Loaded questions
 - Processing errors
 - Sample size

95% confidence limits (or inte



firstranker.com

•