SWRK5001
Unit-III, Types of Sampling

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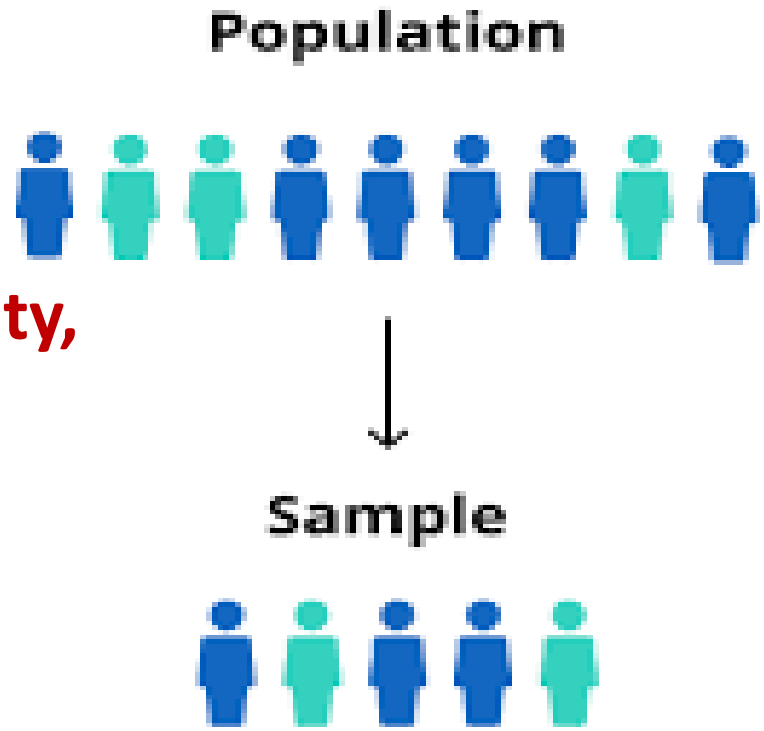


SWRK5001
Unit-III, Research Design & Sampling

Topic- Types of Sampling: Probability & Non Probability

Sampling

- Sampling is a process used in statistical analysis in which a predetermined number of observations are taken from a larger population.

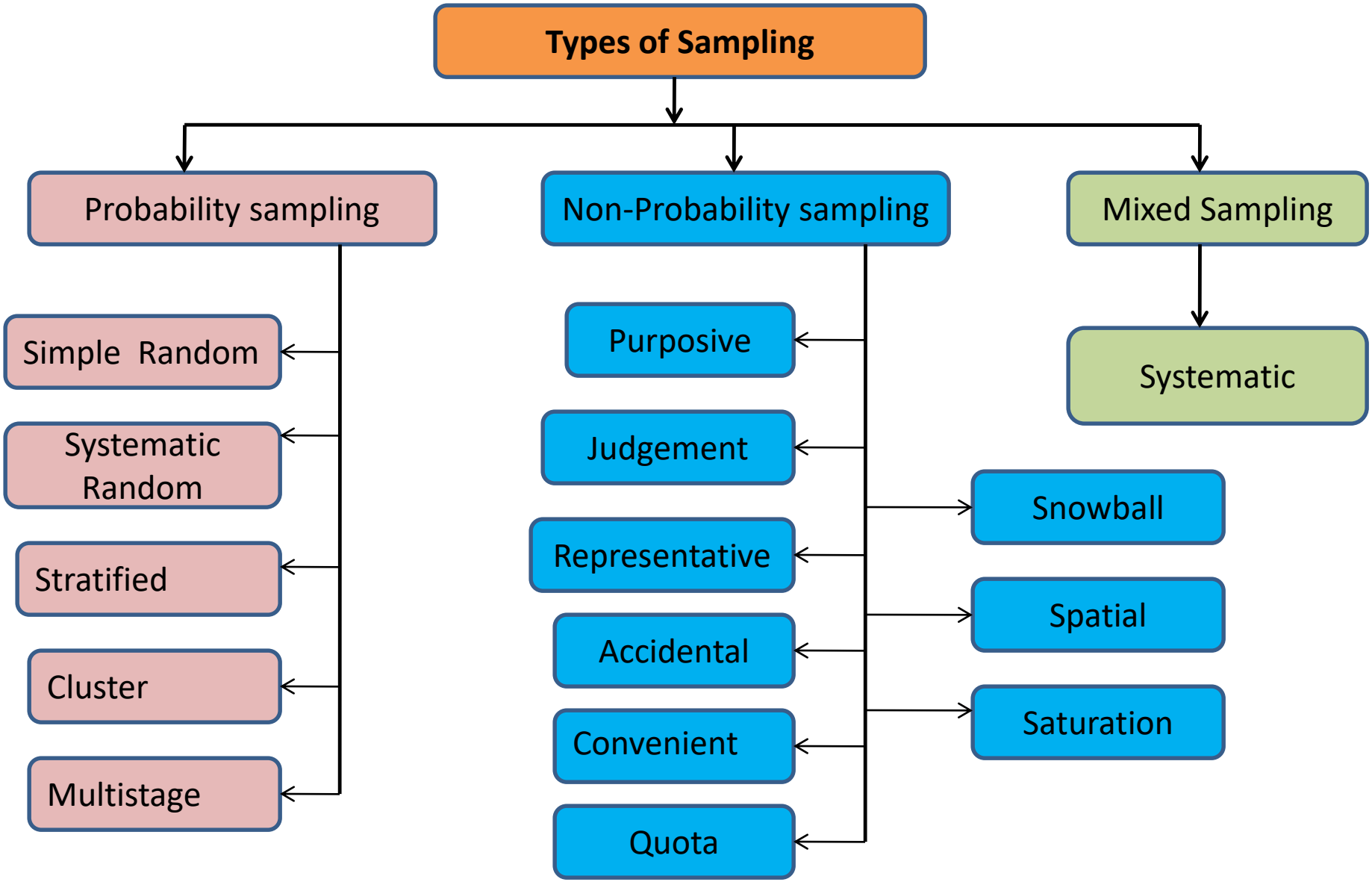
Types of sampling:

We can divide the sampling into three types.

- Probability Sampling
- Non-Probability sampling
- Mixed Sampling

Probability Sampling

- In this type of sampling, every item of the population has an equal chance of entering the sample and the entrance of one item to the sample is independent of another item's presence in the sample. The sampling is also known as random sampling or chance sampling.


Types of Sampling
Probability sampling
Non-Probability sampling
Mixed Sampling
Simple Random
Systematic Random
Stratified
Cluster
Multistage
Purposive
Judgement
Representative
Accidental
Convenient
Quota
Snowball
Spatial
Saturation
Systematic

Non-Probability Sampling

- Here we rely on the judgment of experts or professionals to draw a sample. Here, all the items do not have equal chance of being selected to the sample.

Mixed Sampling

- When two or more sampling methods are adopted for the research, then it is called mixed sampling.

Probability Sampling Methods

- Probability sampling means that every member of the population has a chance of being selected.
- It is also called random sampling methods or random sampling method.
- If you want to produce results that are representative of the whole population, you need to use a probability sampling technique.

Probability Sampling

- A type of sample that uses random sampling in at least one stage of the sampling process.
- i.e. In probability sampling, where equal chance is given or each unit of population/Universe has an equal chance.
- The sampling is also known as random sampling or chance sampling.
- For instance if a sampling frame is a list of 100 students of a specific course of study, in a simple random sample each student has $1/100^{th}$ chance of being selected. Social Work Research.

Simple Random Sampling

- In a simple random sample, every member of the population has an equal chance of being selected. Your sampling frame should include the whole population.
- To conduct this type of sampling, you can use tools like random number generators or other techniques that are based entirely on chance.

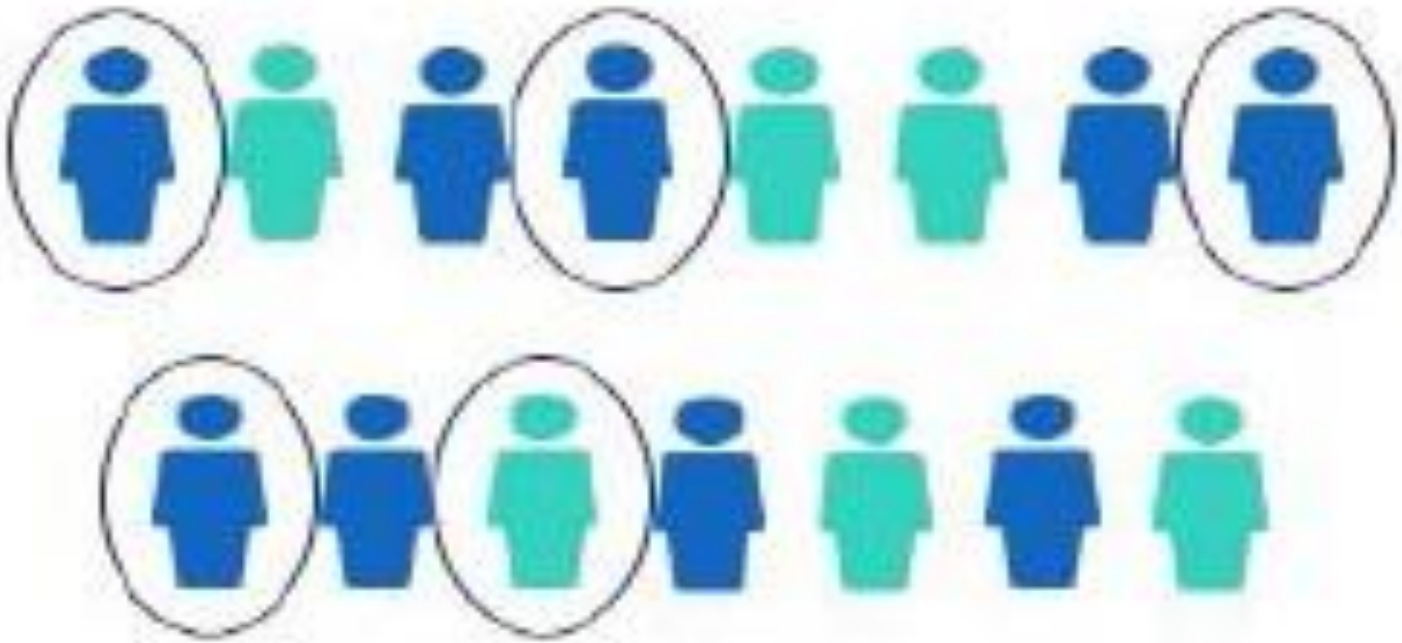
Example

- You want to select a simple random sample of 100 employees of Company X. You assign a number to every employee in the company database from 1 to 1000, and use a random number generator to select 100 numbers.

Simple Random Sampling can be done by using a number of techniques such as:

- Lottery Method
- Random Number
- Tossing a coin
- Throwing a dice

Simple random sample



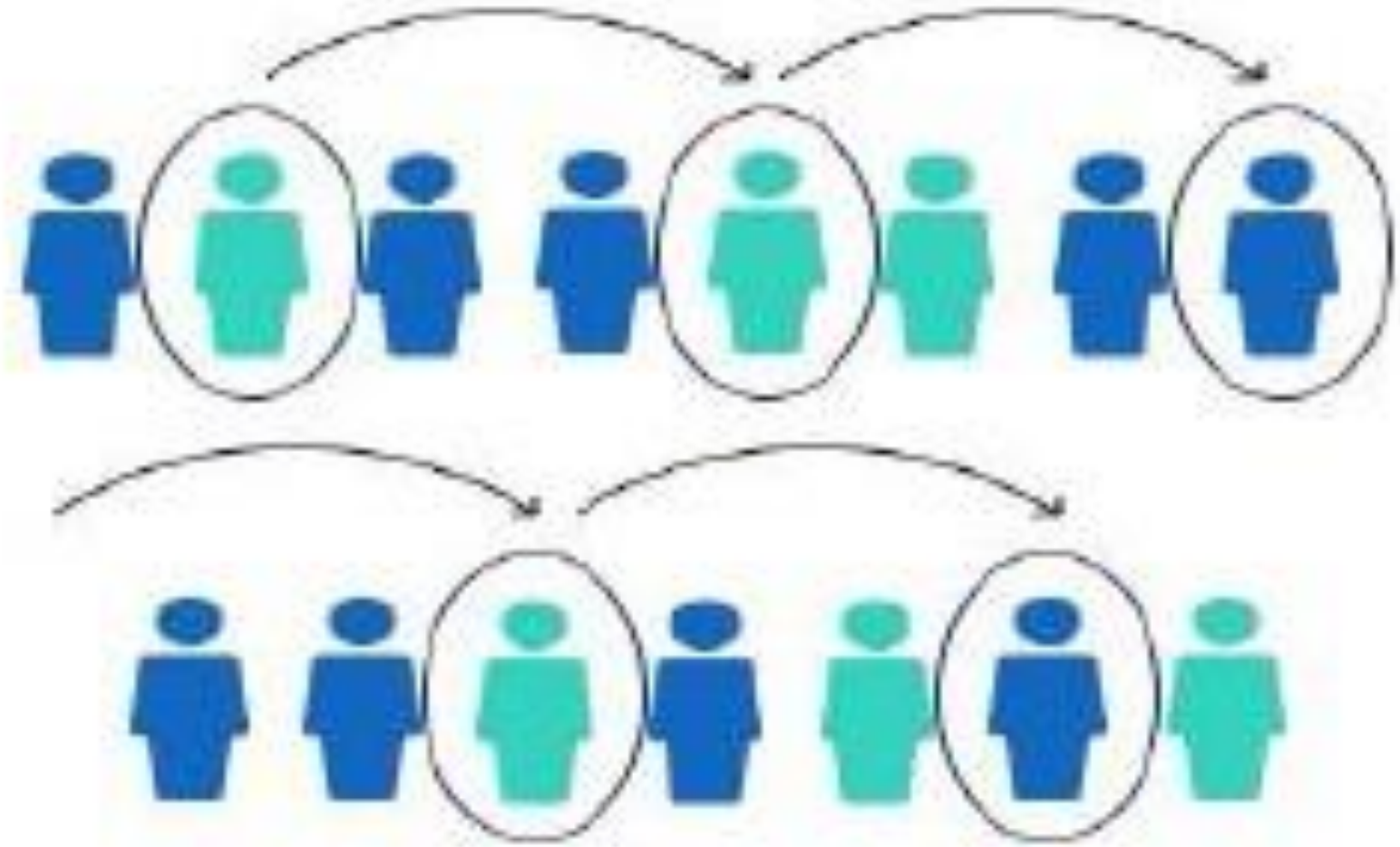
Systematic Sampling

- Systematic sampling is similar to simple random sampling, but it is usually slightly easier to conduct. Every member of the population is listed with a number, but instead of randomly generating numbers, individuals are chosen at regular intervals.

Example

- All employees of the company are listed in alphabetical order. From the first 10 numbers, you randomly select a starting point: number 6. From number 6 onwards, every 10th person on the list is selected and you end up with a sample of 100 people.

Systematic sample



Stratified (Random) Sampling

- This sampling method is appropriate when the population has mixed characteristics, and you want to ensure that every characteristic is proportionally represented in the sample.
- You divide the population into subgroups (called strata) based on the relevant characteristic .

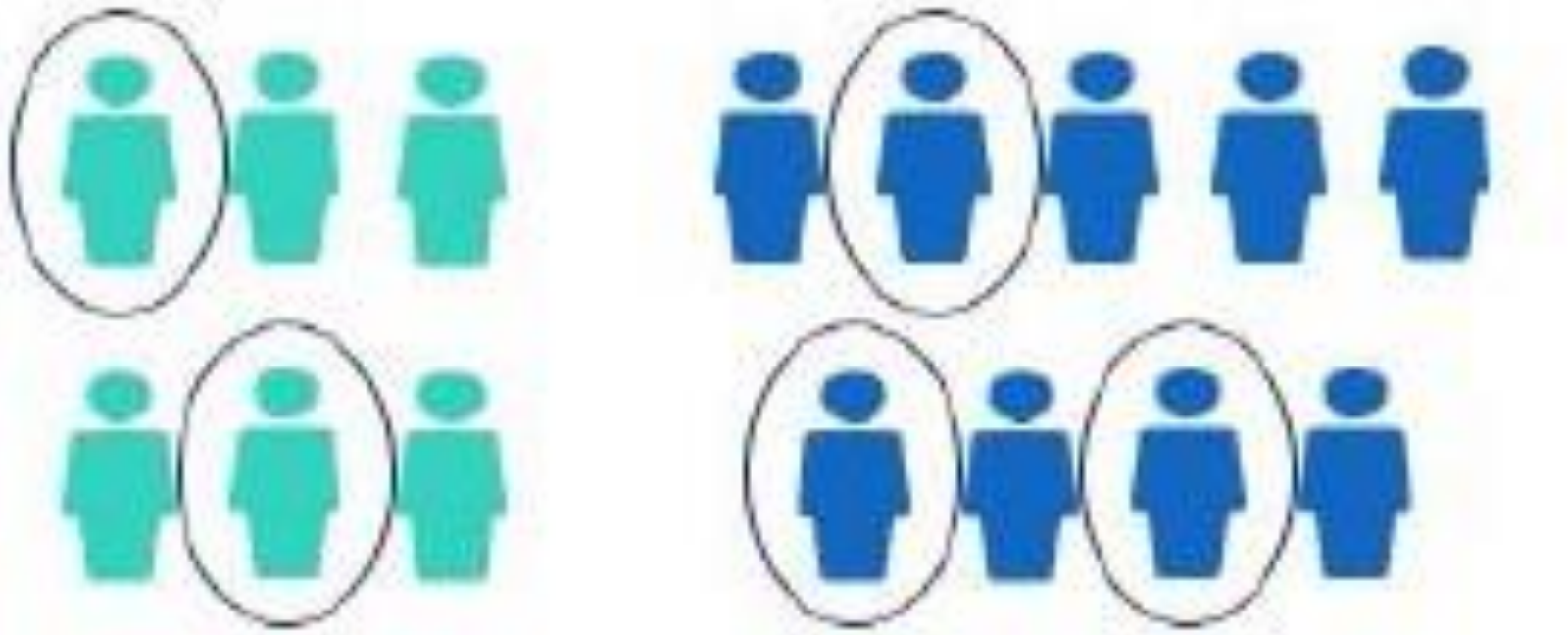
Example

- The company has 800 female employees and 200 male employees. You want to ensure that the sample reflects the gender balance of the company, so you sort the population into two strata based on gender. Then you use random sampling on each group, selecting 80 women and 20 men, which gives you a representative sample of 100 people.

Stratified sampling is divided into three main parts-

- Proportionate
- Disproportionate
- Optimum

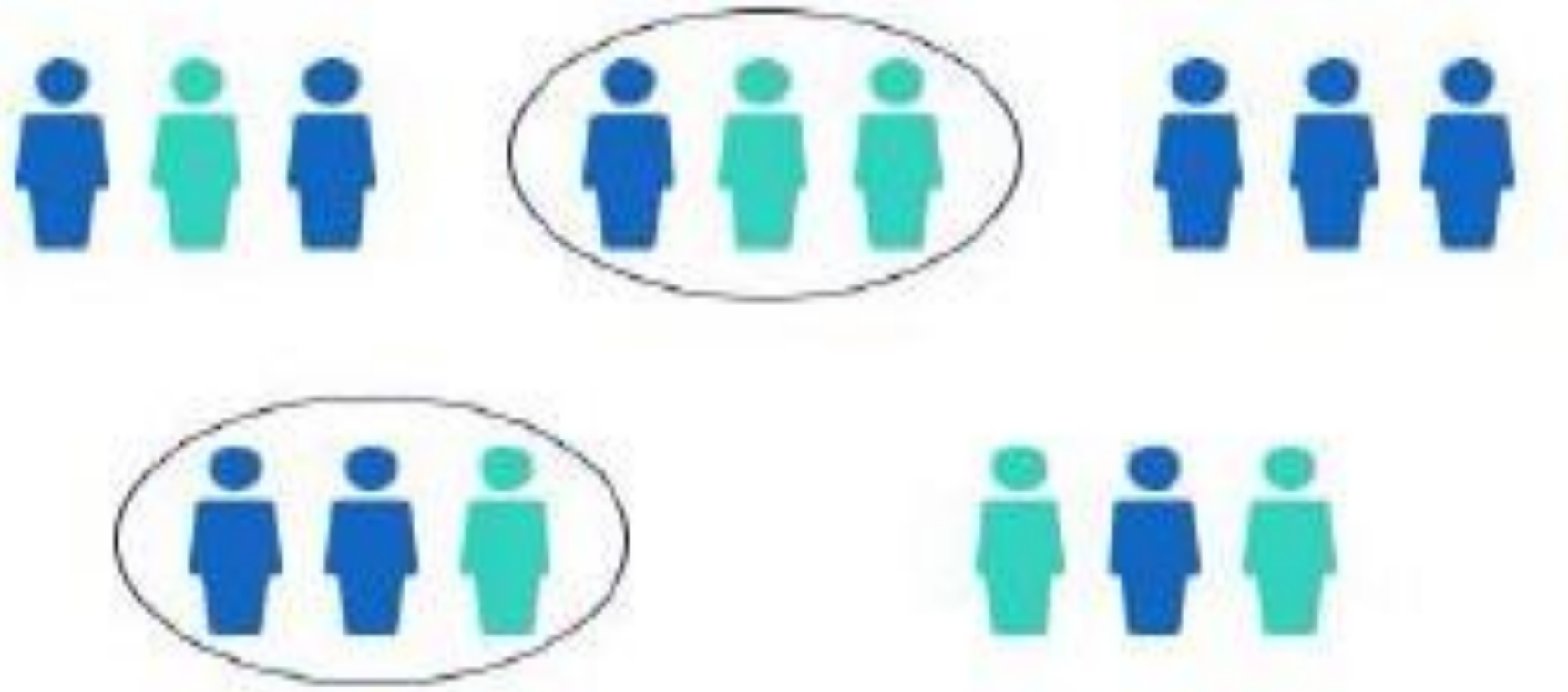
Stratified sample



Cluster Sampling

- Cluster sampling also involves dividing the population into subgroups, but each subgroup should have similar characteristics to the whole sample. Instead of sampling individuals from each subgroup, you randomly select entire subgroups.
- ***Example***
- The company has offices in 10 cities across the country (all with roughly the same number of employees in similar roles).

Cluster sample



Multistage

- In this method, the items are selected in different stages at random.
- This method is applicable only where the universe is very large.
- In a sense, this method is a combination of random sampling and stratified sampling.
- For E.g. Socio Economic Conditions of all states in India

Non-Probability Sampling Methods

- In a non-probability sample, individuals are selected based on non-random criteria, and not every individual has a chance of being included.
- This type of sample is easier and cheaper to access, but you can't use it to make valid statistical inferences about the whole population.
- Non-probability sampling techniques are often appropriate for exploratory and qualitative research. In these types of research, the aim is not to test a hypothesis about a broad population, but to develop an initial understanding of a small or under-researched population.

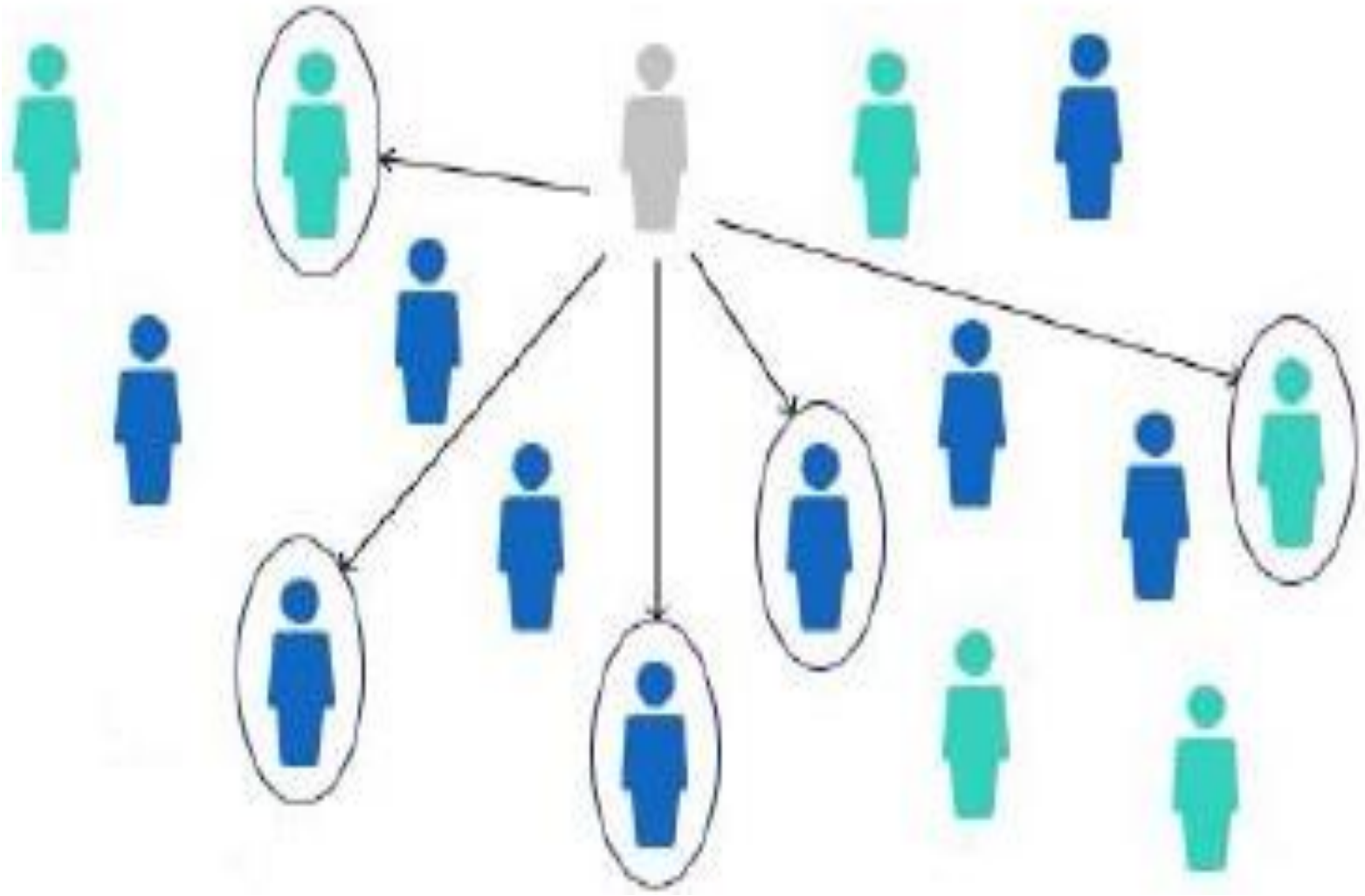
Purposive Sampling

- This type of sampling involves the researcher using their **judgement** to select a sample that is most useful to the purposes of the research.

Example

- You want to know more about the opinions and experiences of disabled students at your university, so you purposefully select a number of students with different support needs in order to gather a varied range of data on their experiences with student services.

Purposive sample



Judgement

- A type of non –probability sample in which the researcher selects the sample units based on subjective judgment of the researcher. It involves the selection of cases which we judge as the most appropriate ones for the given study.
- Eg. Conducting survey.

Representative

- In this method, the investigator does not select the sample or units. The samples offer themselves for selection. This method is generally applied when the sampling area is not fixed.
- For e.g. you may take the first 150 people he meet on any one of the pedestrian path/ pass buyer or first 50 will be taken.

Accidental

- A type of non-probability sample in which subjects are recruited for study as they become available or because they are conveniently accessible to the researcher.
  - It happens without any pre-plan
  - Whomever we meet
  - foretell of election results

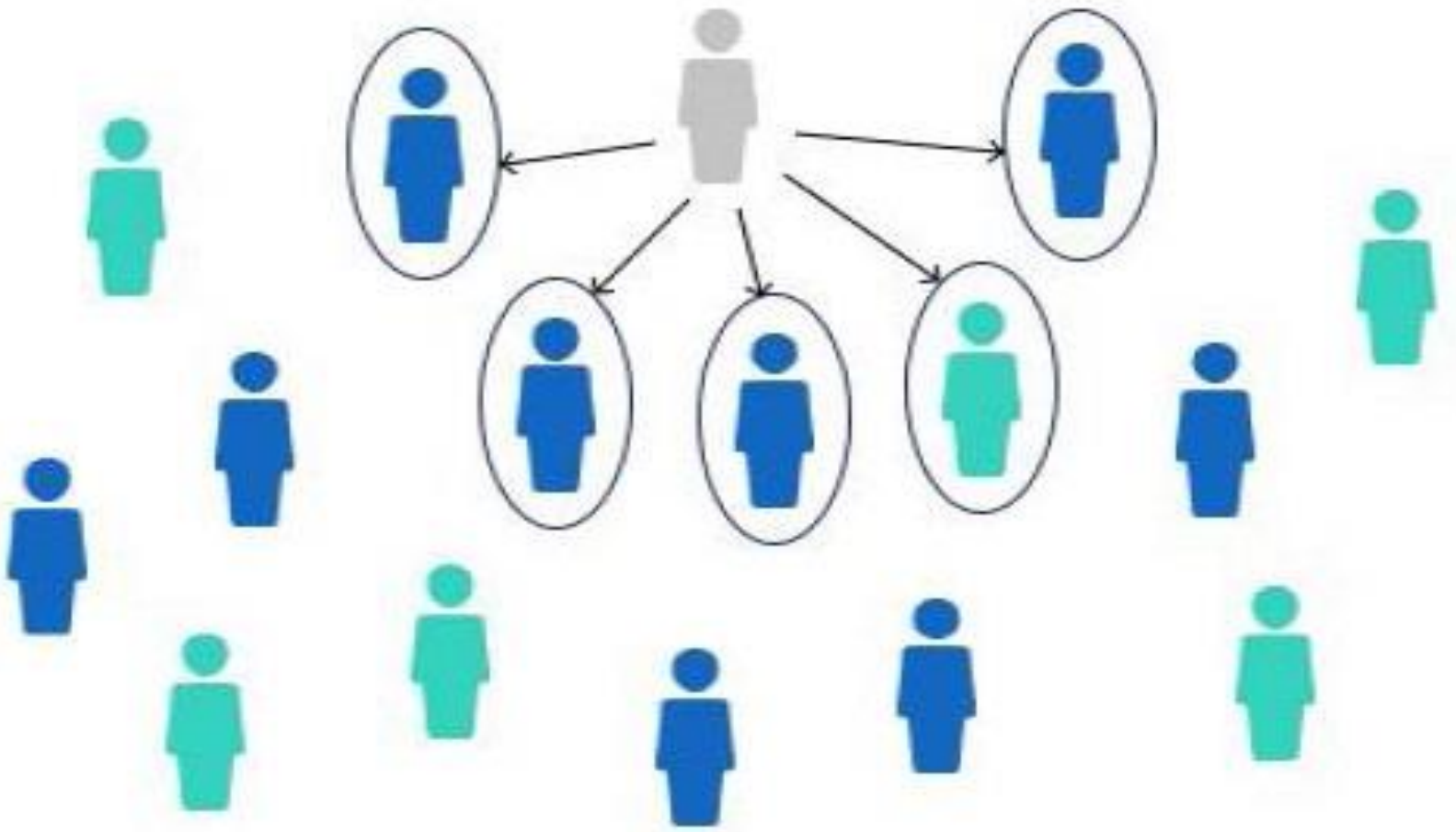
Convenience Sampling

- A convenience sample simply includes the individuals who happen to be most accessible to the researcher.
- This is an easy and inexpensive way to gather initial data, but there is no way to tell if the sample is representative of the population, so it can't produce generalizable results.

Example

- You are researching opinions about student support services in your university, so after each of your classes, you ask your fellow students to complete a survey on the topic. This is a convenient way to gather data, but as you only surveyed students taking the same classes as you at the same level, the sample is not representative of all the students at your university.

Convenience sample



Quota Sampling

- A type of non-probability sample in which the researcher establishes quotas for recruitment of subjects into the sample so that the sample will similar to the population on selected characteristics.

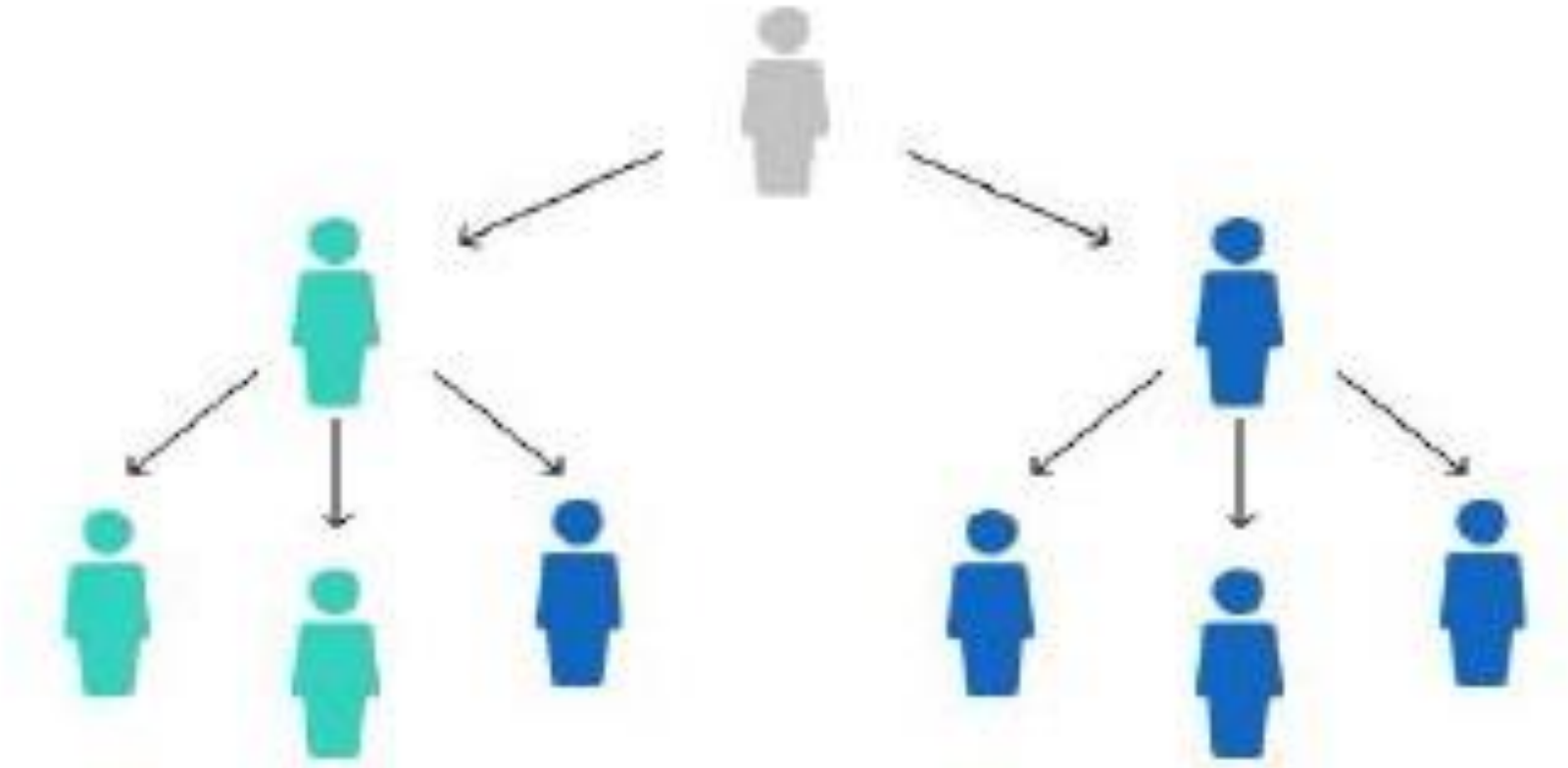
Snowball Sampling

- If the population is hard to access, snowball sampling can be used to recruit participants via other participants. The number of people you have access to "snowballs" as you get in contact with more people.

Example

- You are researching experiences of homelessness in your city. Since there is no list of all homeless people in the city, probability sampling isn't possible.

Snowball sample



Spatial Sampling

- Some populations are not static; they move from place to place staying at a place while an event is taking place. In such a case the whole population (wherever possible) at a particular place are taken into the sampling and studied.

  -Lombadies

  -Narikuravas

  -Nomadic

Saturation

- Certain activities require that all numbers of population need to be studied. So as to get a picture of the entire population.
- The sampling method that requires a study of al population is called saturation sampling.
- In socio-metric studies this technique is adopted. In such studies even if one person is left out we get distorted results.
- Group dynamics in-group member is limited
- E.g. Attraction repulsion.

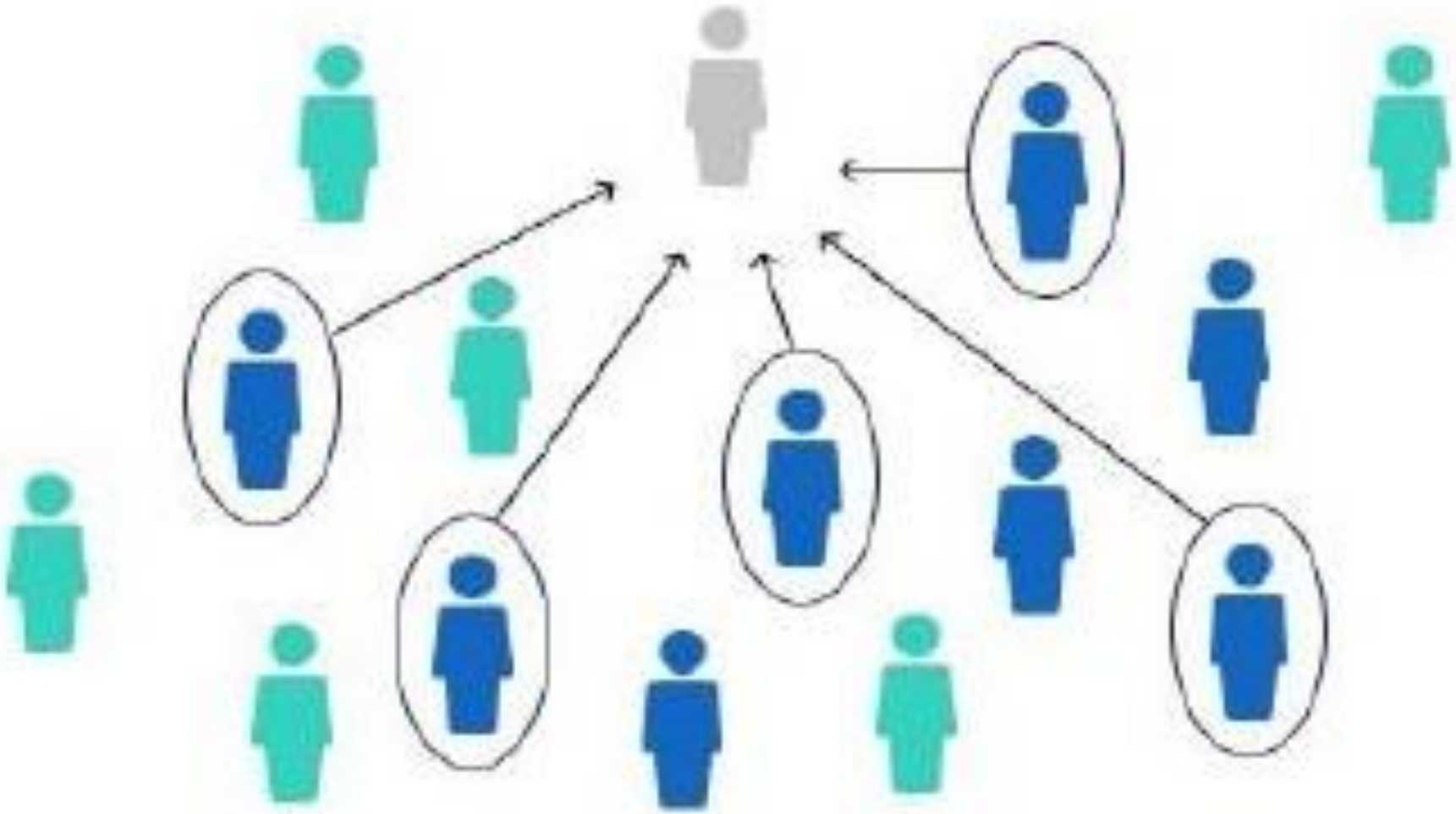
Voluntary Response Sampling

- Similar to a convenience sample, a voluntary response sample is mainly based on ease of access. Instead of the researcher choosing participants and directly contacting them, people volunteer themselves
- Voluntary response samples are always at least somewhat biased, as some people will inherently be more likely to volunteer than others.

Example

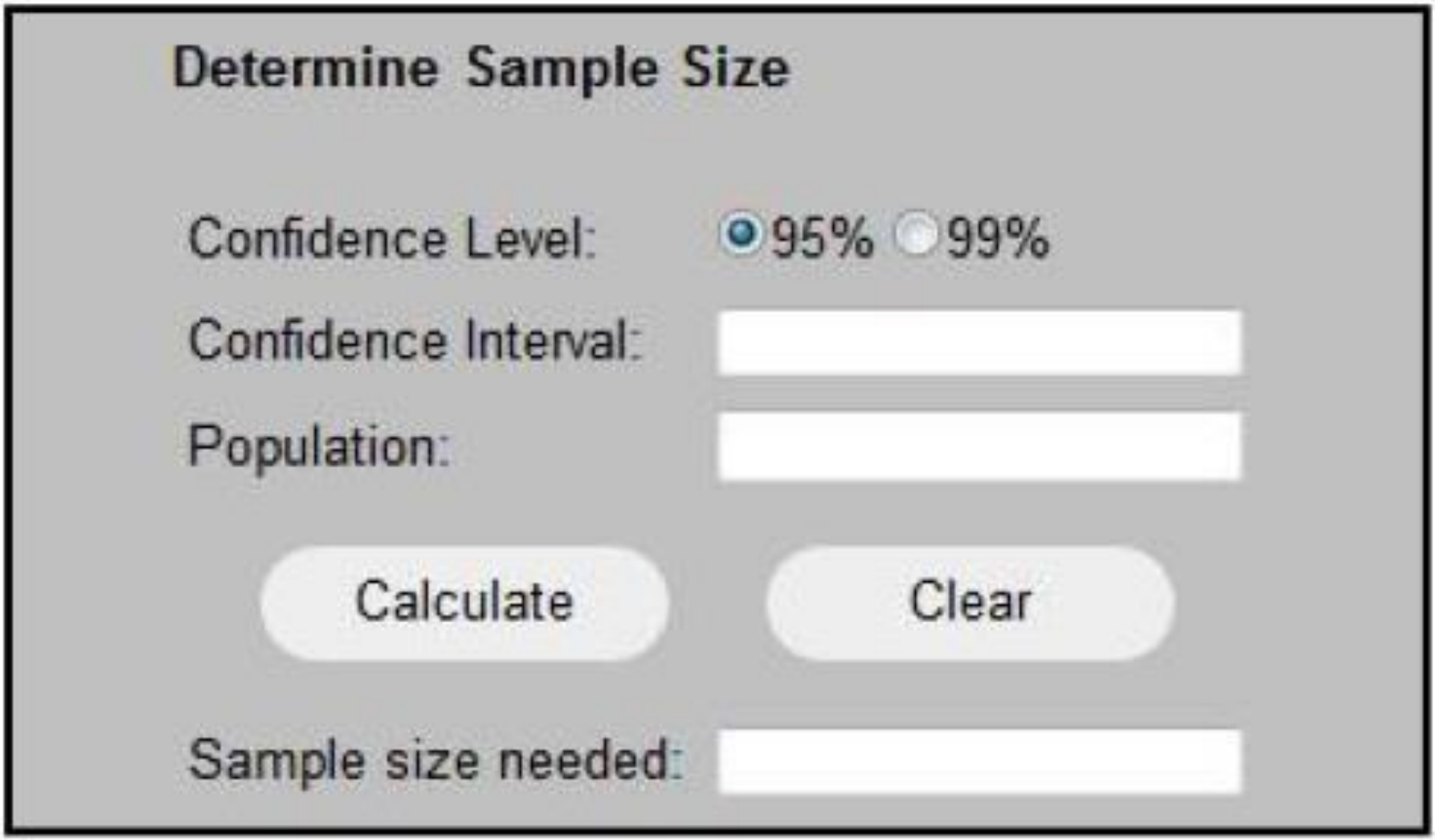
- You send out the survey to all students at your university and a lot of students decide to complete it. This can certainly give you some insight into the topic, but the people who responded are more likely to be those who have strong opinions about the student support services, so you can't be sure that their opinions are representative of all students.

Voluntary response sample



Sample Size Calculator

- Before using the sample size calculator, there are two terms that you need to know.
- These are: **confidence interval** and **confidence level**.
- Enter your choices in a calculator below to find the sample size you need or the confidence interval you have.
- Leave the Population box blank, if the population is very large or unknown.

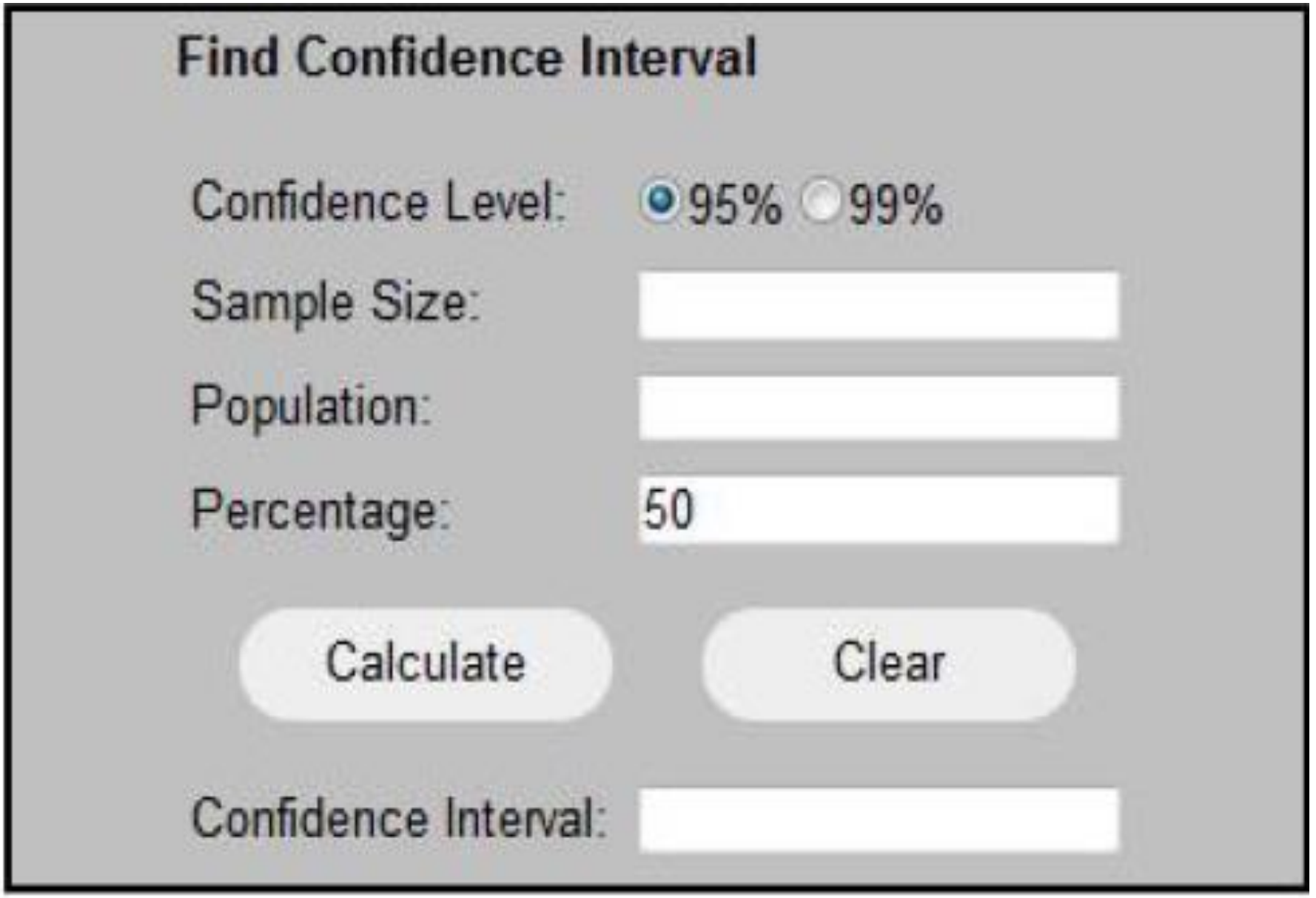

Determine Sample Size
Confidence Level:
95%
99%
Confidence Interval:
Population:
Calculate
Clear
Sample size needed:

Confidence Level

- The **confidence interval** also called margin of error is the plus-or-minus figure usually reported in newspaper or television opinion poll results.
- For example, if you use a confidence interval of 4 and 47% percent of your sample picks an answer you can be "sure" that if you had asked the question of the entire relevant population between 43% (47-4) and 51% (47+4) would have picked that answer.

Confidence Level

- The **confidence level** tells you how sure you can be. It is expressed as a percentage and represents how often the true percentage of the population who would pick an answer lies within the confidence interval.
- The 95% confidence level means you can be 95% certain; the 99% confidence level means you can be 99% certain.
- Most researchers use the 95% confidence level.


Find Confidence Interval
Confidence Level:
95%
99%
Sample Size:
Population:
Percentage:
50
Calculate
Clear
Confidence Interval:

Sample Size Calculation

You can calculate sample size by using this link

- https://www.surveysystem.com/sscalc.htm
- https://www.calculator.net/sample-size-calculator.html
- https://www.qualtrics.com/blog/calculating-sample-size/

Sampling Error

- Sampling error is the deviation of the selected sample from the true characteristics, traits, behaviors, qualities or figures of the entire population.
- Sampling error is the difference between a population parameter and a sample statistic used to estimate it.
- For example, the difference between a population mean and a sample mean is sampling error.
- Sampling error occurs because a portion, and not the entire population, is surveyed.
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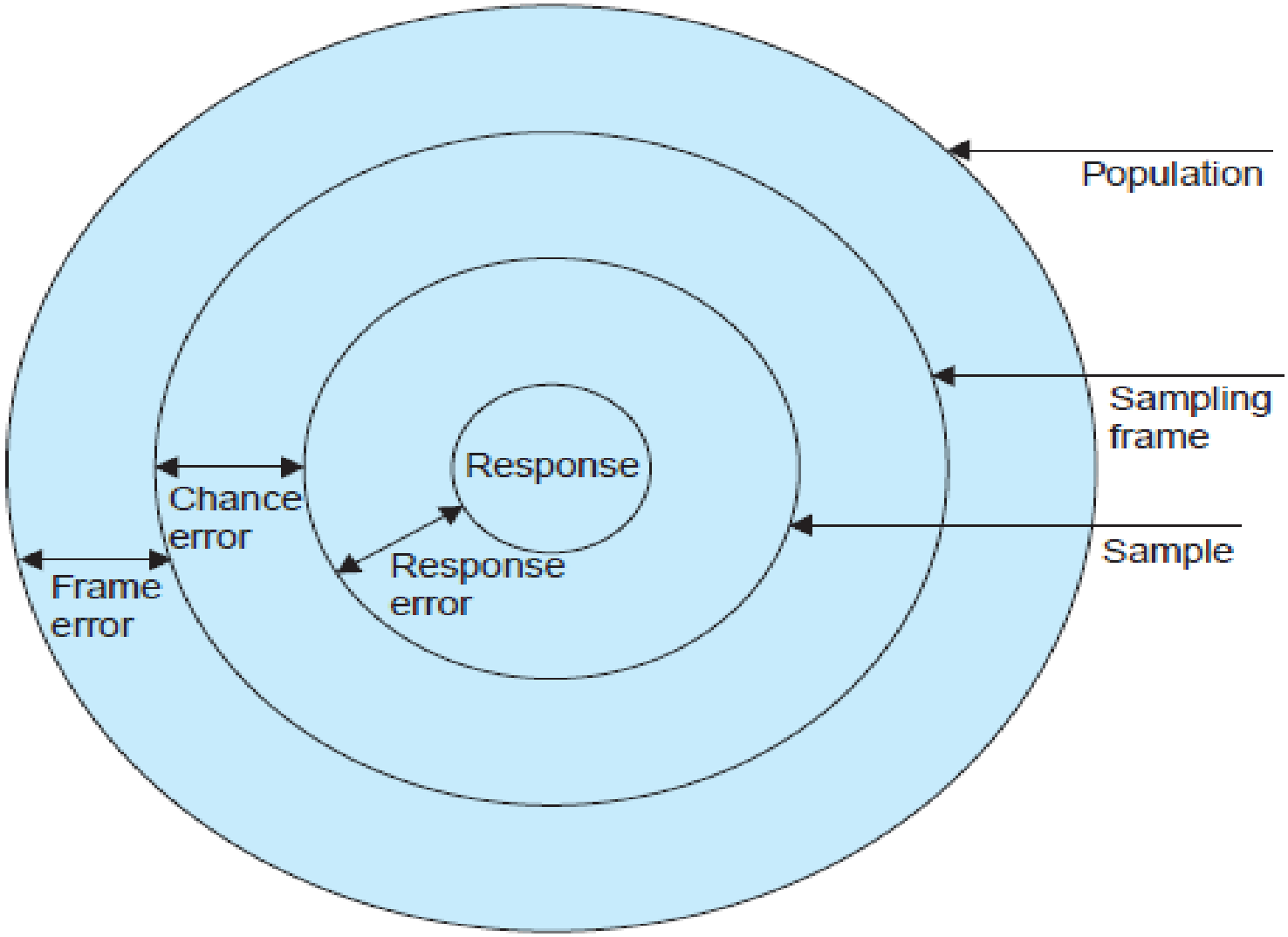

Sampling error = Frame error
+ chance error + response error.

(If we add measurement error or the non-sampling error to sampling error, we get total error)

References-

- Andale. (June 26, 2015). Probability Sampling: Definition, Types, Advantages and Disadvantages. Statistics How To. Retrieved from http://www.statisticshowto.com/probability-sampling/.
- Daniel, J. (2012). Sampling Essentials: Practical Guidelines for Making Sampling Choices. Sage Publications, pp 103.
- King, R. M. Types of sampling. Advanced Research Methods. Retrieved from http://www.psyking.net/HTMLobj-3829/Types_of_Sampling.pdf.
- Retrieved from- https://www.surveysystem.com/sscalc.htm.
- Retrieved from- https://images.app.goo.gl/RSNPe1puZHwbyS8r5.
- Explorable.com (Jan 7, 2009). Sampling Error. Retrieved Apr 25, 2020 from Explorable.com: https://explorable.com/sampling-error

Thank You