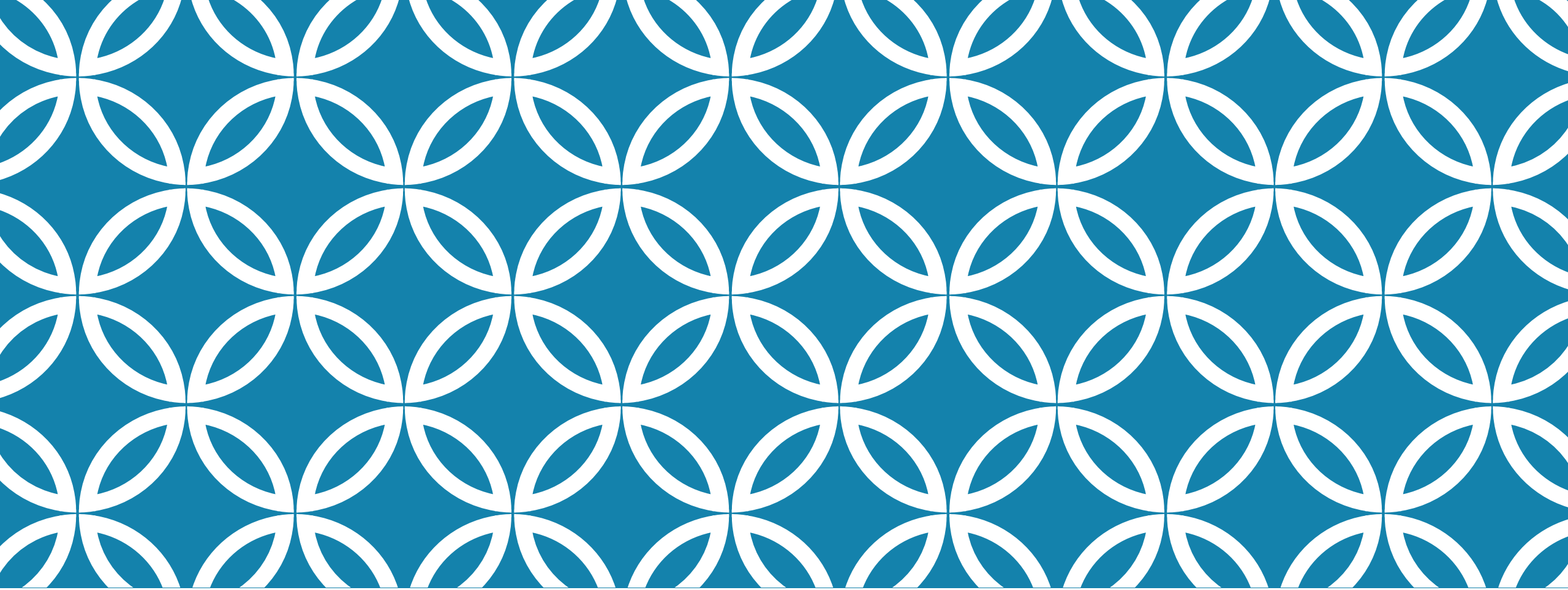


CHOOSING SAMPLES FROM POPULATIONS

Chapter:5

LEARNING OBJECTIVES

1. Understand how and why sampling relates to business research
2. Identify and use a range of probability and non-probability sampling techniques
3. Select appropriate techniques for different research studies
4. Understand and assess representativeness of samples and generalizability from samples
5. Define key terms associated with sampling

HOW AND WHY SAMPLING RELATES TO BUSINESS RESEARCH

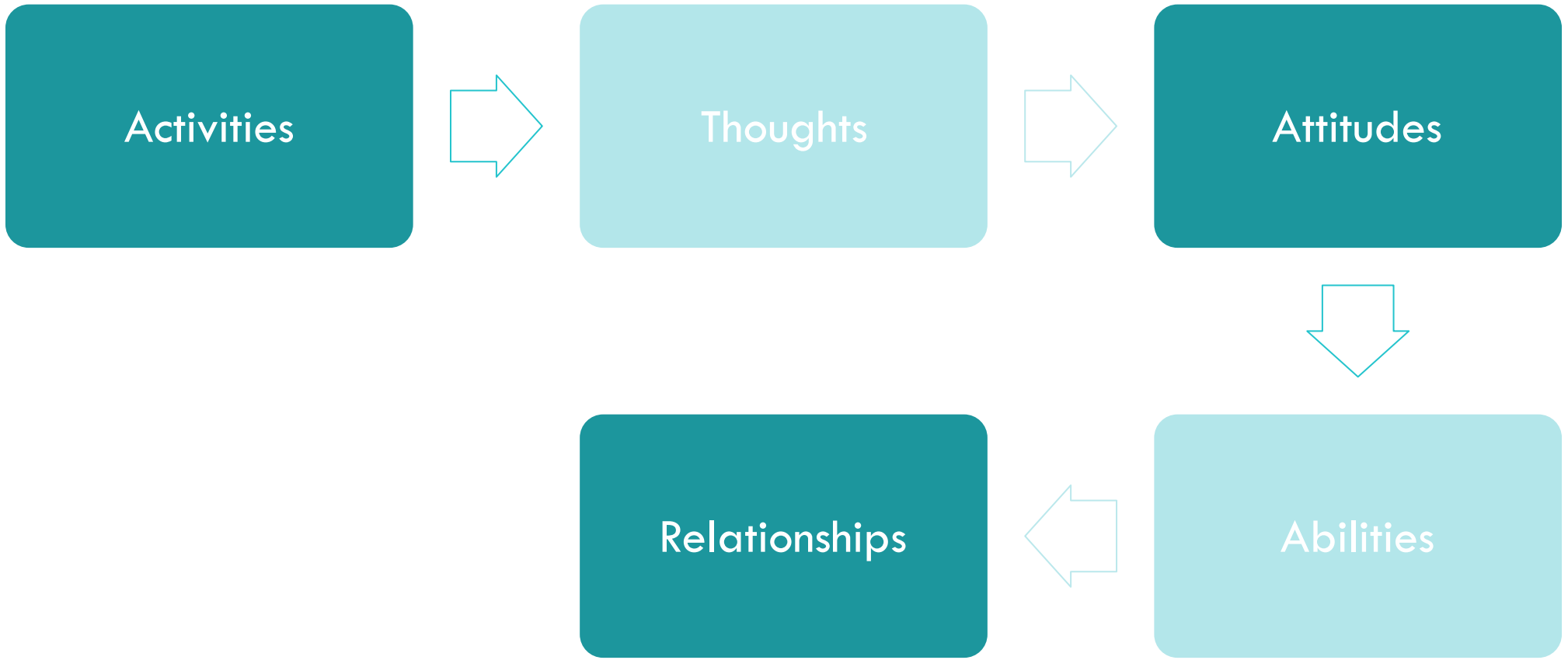
Problem 1:

The world is large and full of people

Problem 2:

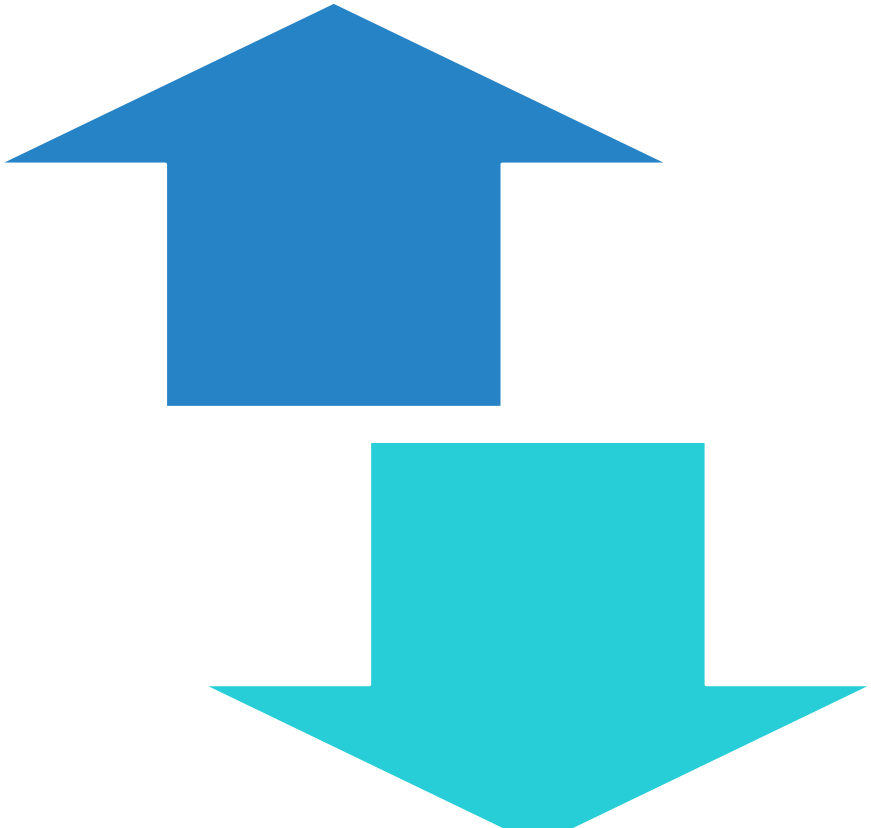
We wanted to find out things about people

HOW AND WHY SAMPLING RELATES TO BUSINESS RESEARCH



WHAT IS THE PURPOSE OF SAMPLING?

Understand the population



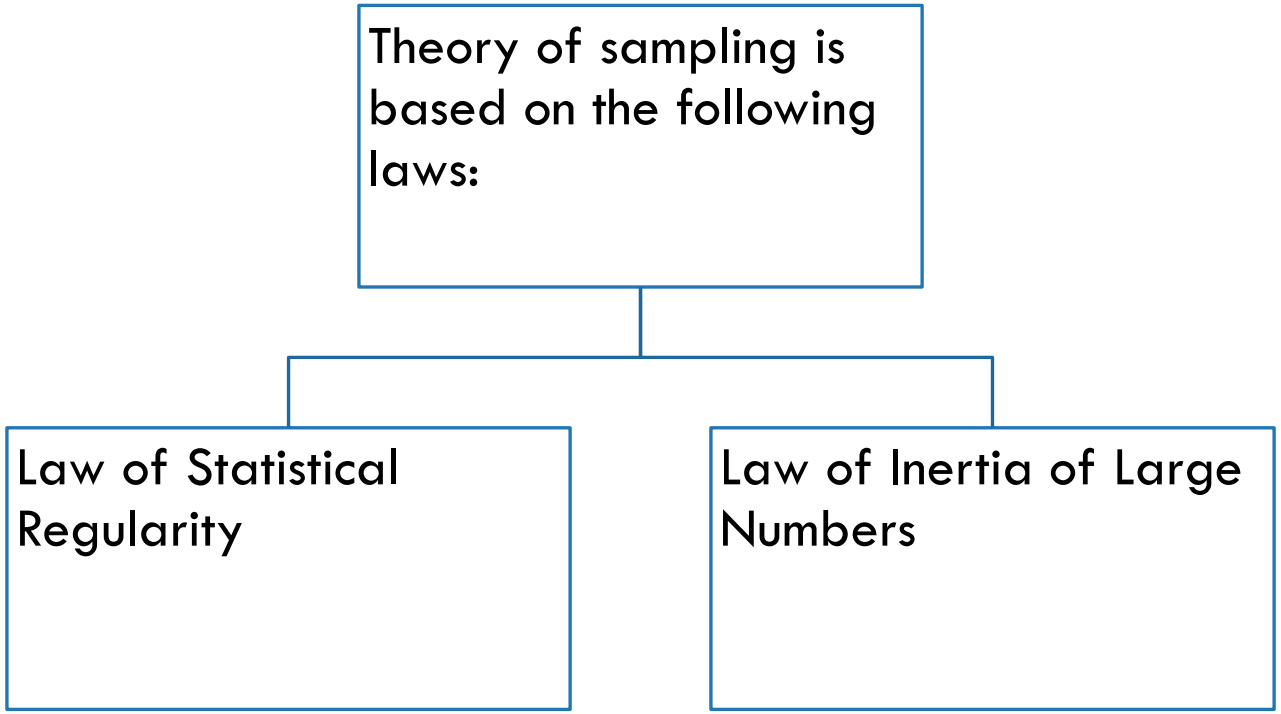
To gather data about the population in order to make an inference that can be generalized to the population

MEANING OF SAMPLING

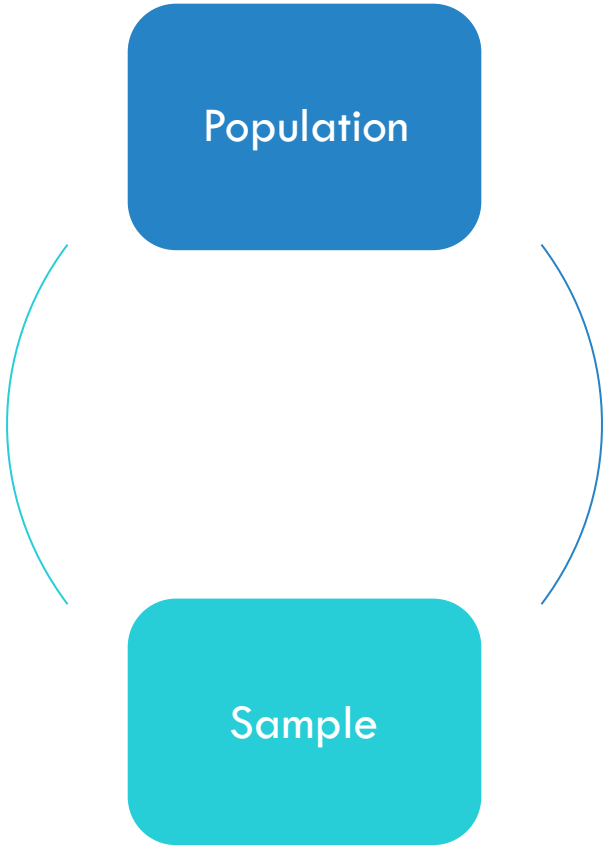
"Sampling method is the process or the method of drawing a definite number of the individuals, cases or the observations from a particular universe, selecting part of a total group for investigation."

According to Mildred Parton

BASIC PRINCIPLES OF SAMPLING



PARTICIPANTS



EXAMPLE

All people with schizophrenia in the United States (approximately 3.1 million individuals).

Californians' view on raisins (38 million).

Immigrants beliefs about the U.S.'s foreign policy (nobody really knows how many if you include illegal and legal).

POPULATION

Note: the population from which the sample is drawn may not be the same as the population about which we actually want information. Often there is large but not complete overlap between these two groups due to frame issues etc.

A population can be defined as including all people or items with the characteristic one wishes to understand.

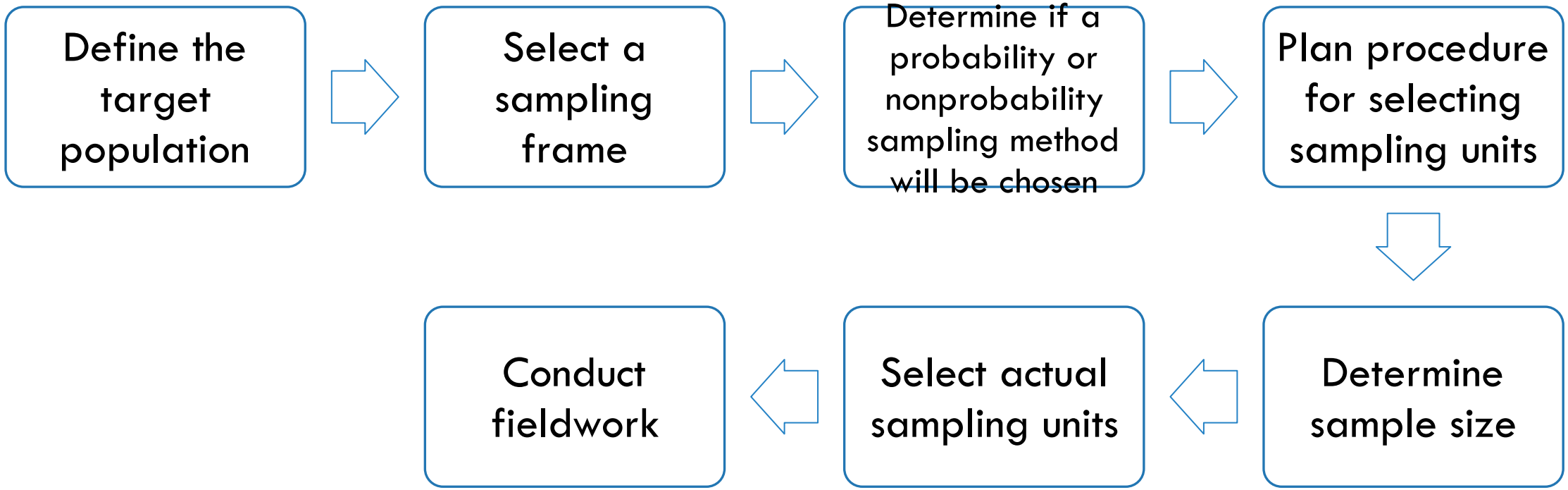
THE ADVANTAGES OF SAMPLING

- Very accurate.
- Economical in nature.
- Very reliable.
- High suitability ratio towards the different surveys.
- Takes less time.
- In cases, when the universe is very large, then the sampling method is the only practical method for collecting the data.

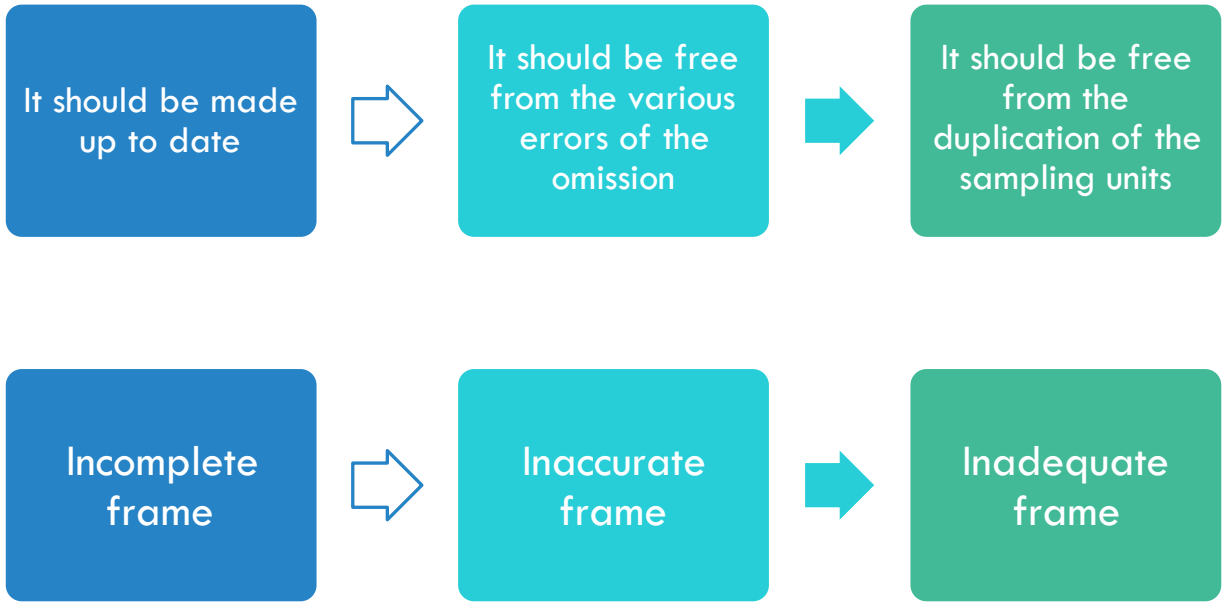
DISADVANTAGES OF SAMPLING

- Inadequacy of the samples
- Chances for bias
- Problems of accuracy
- Difficulty of getting the representative sample
- Untrained manpower
- Absence of the informants
- Chances of committing the errors in sampling.

STAGES IN THE SELECTION OF A SAMPLE



WHAT IS SAMPLING FRAME?



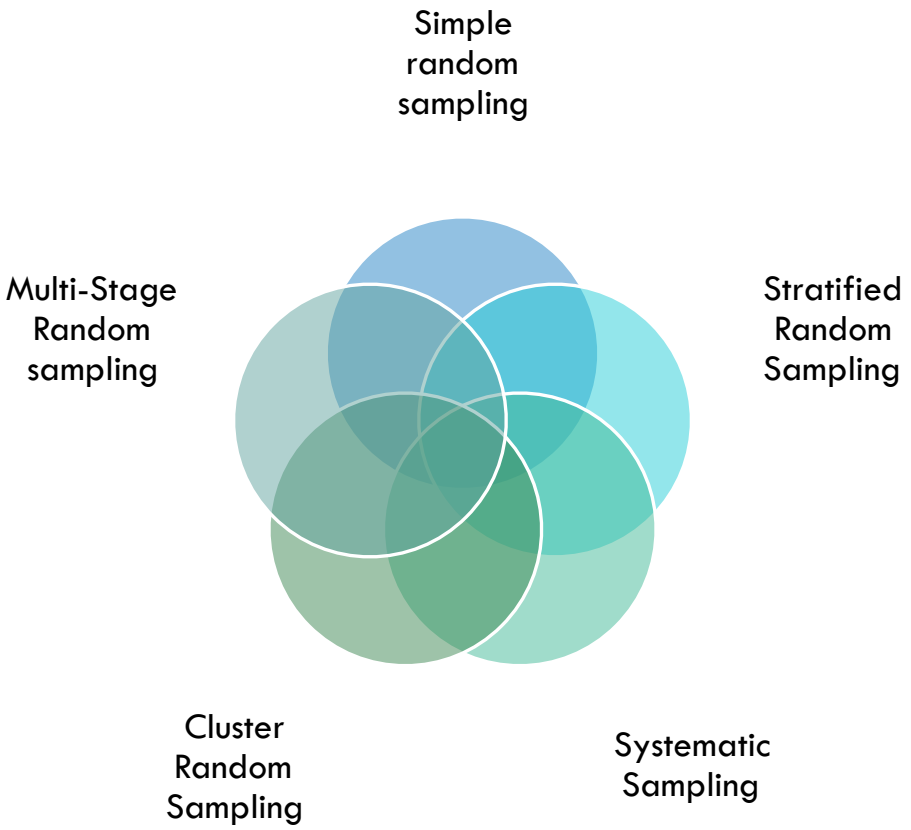
TYPES OF SAMPLING

Probability

Non-probability

PROBABILITY SAMPLING

TYPES OF PROBABILITY SAMPLING

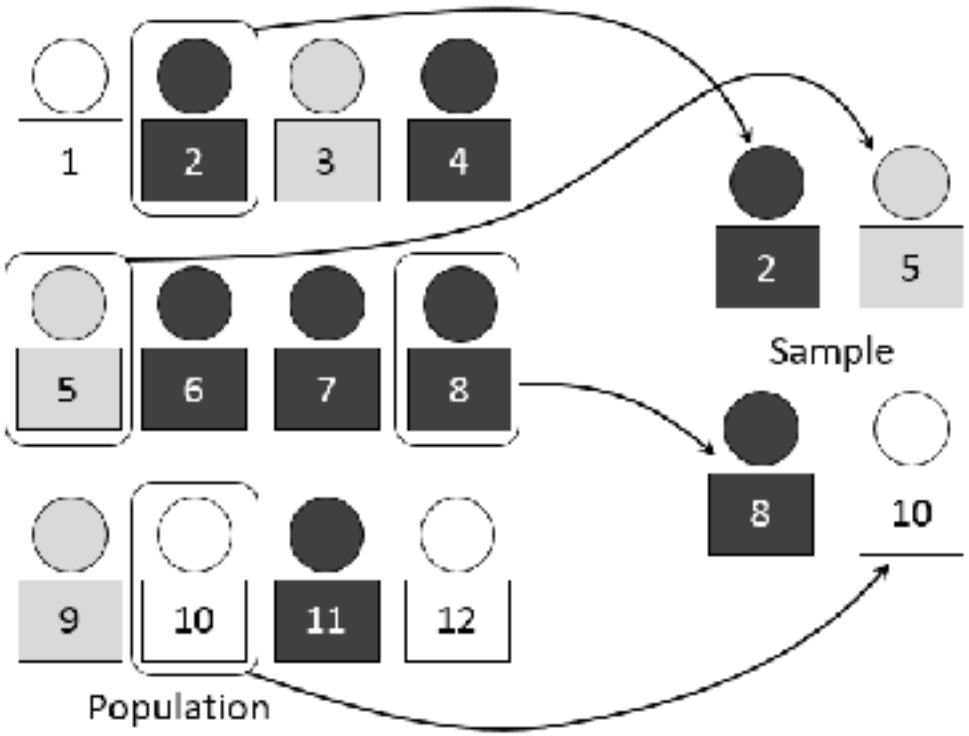


WHAT IS A RANDOM SAMPLE?

It is chosen randomly

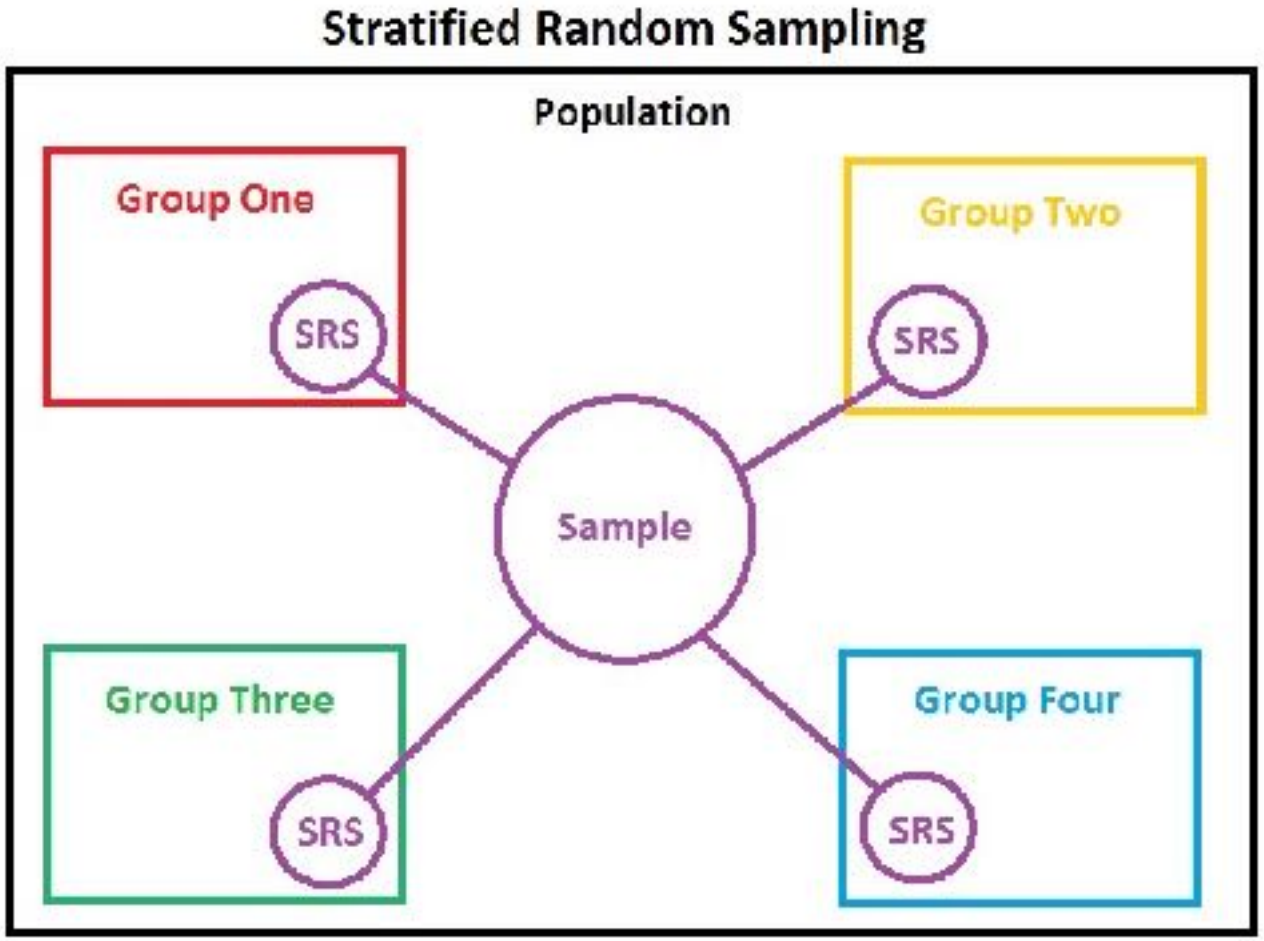
Random samples are used to avoid bias and other unwanted effects.

WHAT IS A SIMPLE RANDOM SAMPLE?



Simple random sampling of a sample "n" of 3 from a population "N" of 12. Image: Dan Kernler |Wikimedia Commons

WHAT IS STRATIFIED RANDOM SAMPLING?



WHAT IS SYSTEMATIC SAMPLING?

Choose every "nth" participant from a complete list

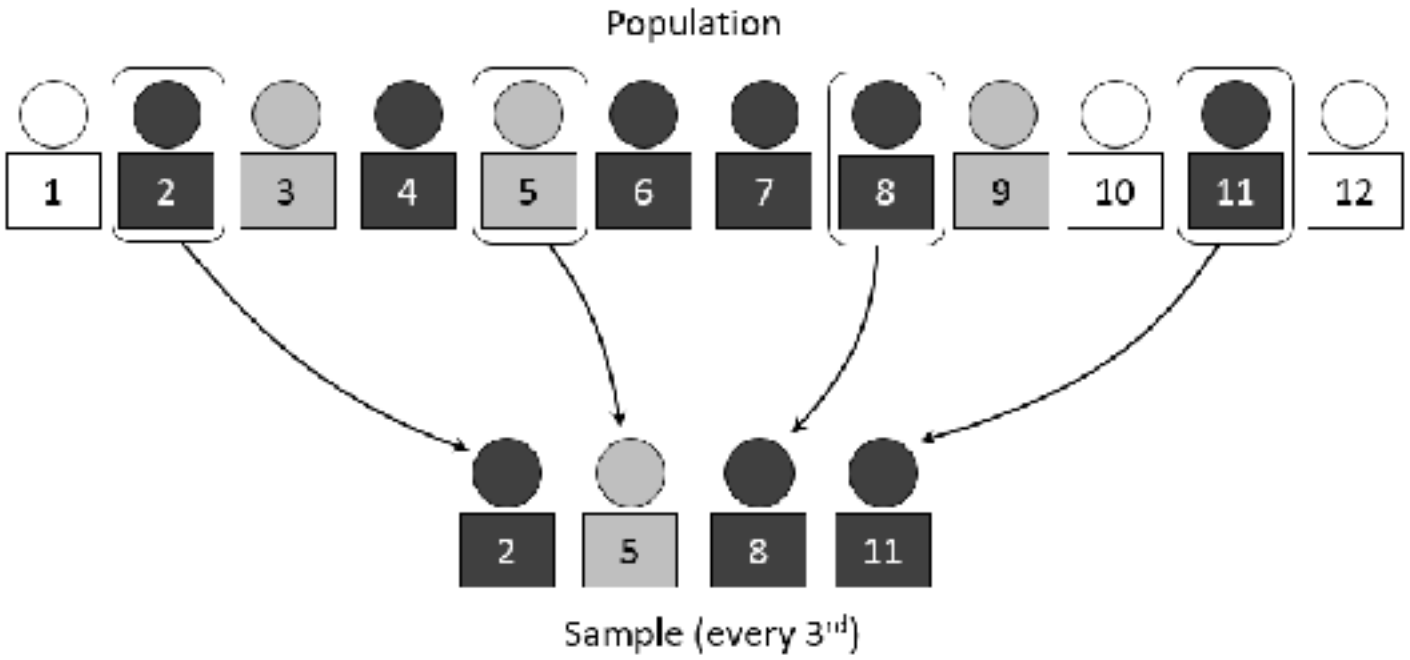


Image: Dan Kernler |Wikimedia Commons

CLUSTER RANDOM SAMPLING

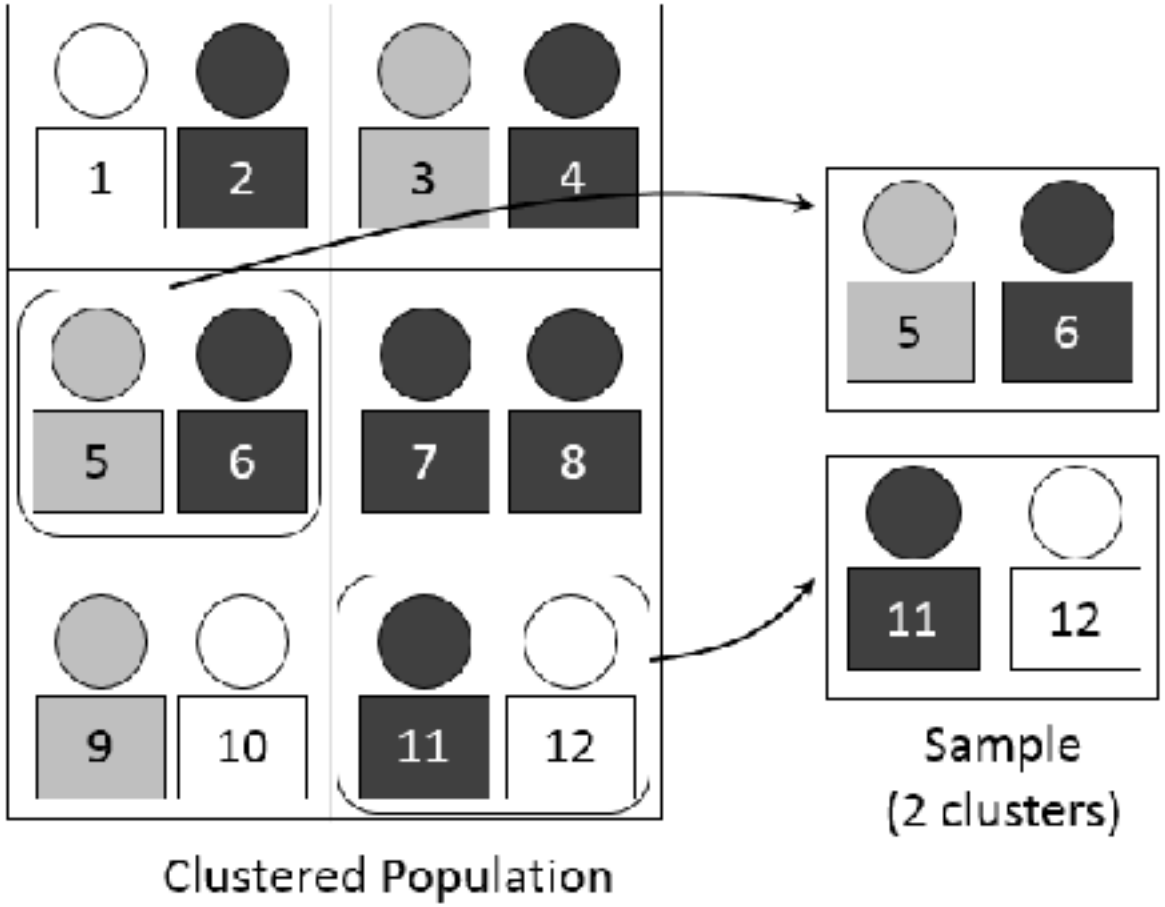


Image: Dan Kernler |Wikimedia Commons

ADVANTAGES AND DISADVANTAGES OF CLUSTER SAMPLING

- This method's greatest advantage is operational: selecting a cluster to study is typically easier and more affordable than creating a random or systematic sample. For example, we saw above how using geographic clusters can amount to significant savings on travel.
- Strangely enough, it is common for studies conducted online to continue to think in terms of regions, even though there is no operational incentive to do so; very much to the contrary, this approach heightens the risk of imprecision due to differences between the regions studied and the rest of population. This practice is the unjustified bequest of techniques that were good for live interviews, but that make no sense for other methods.
- The chief disadvantage of using cluster sampling is the notable risk that the clusters may not be truly homogeneous among each other. In the above example about Argentine smokers, perhaps one of the provinces is more inclined to smoke because it is more urban, or for cultural reasons, or due to any number of other possible factors.

MULTI-STAGE RANDOM SAMPLING

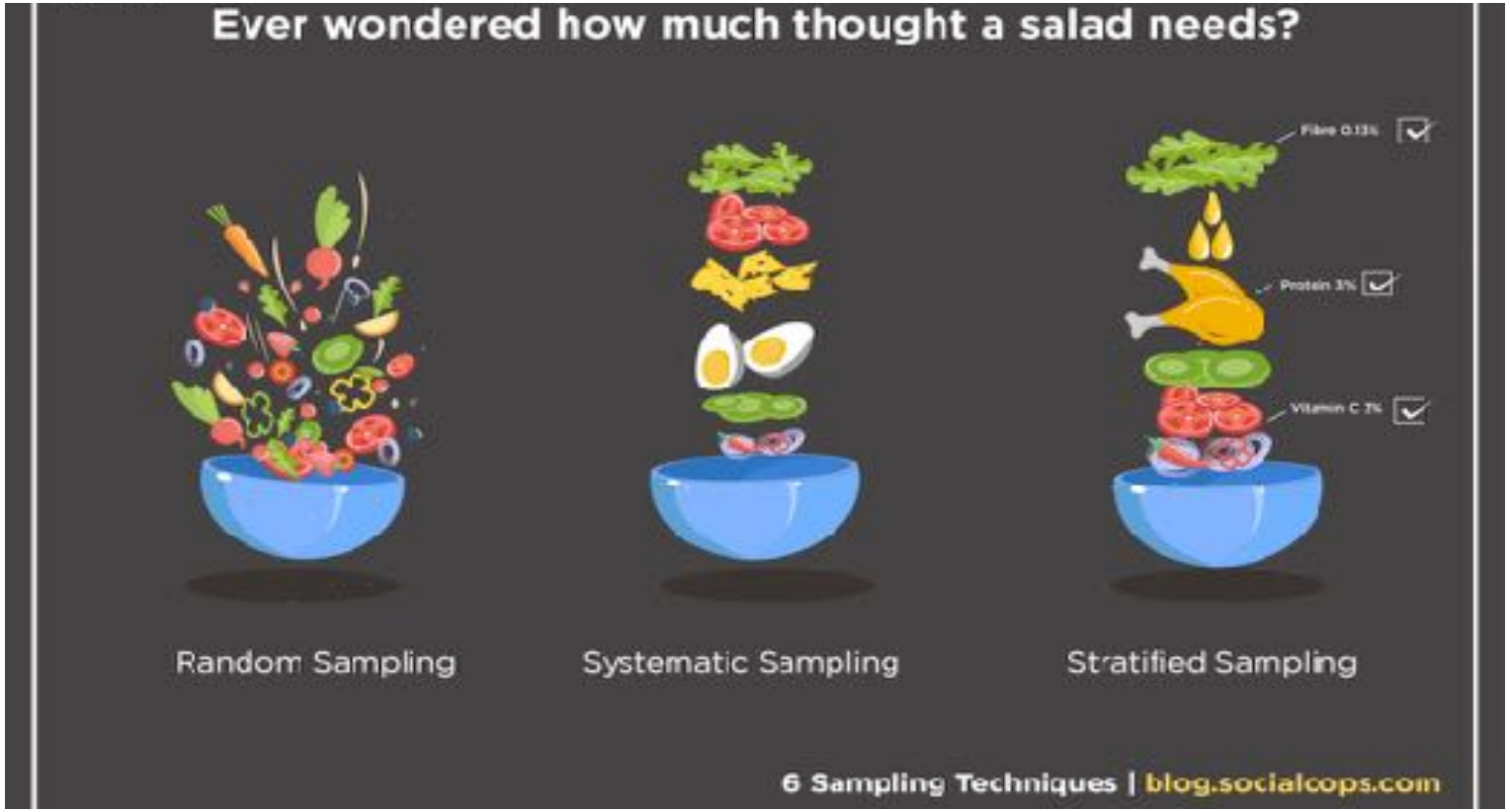
Advantages

- ✓ Cost and speed that the survey can be done in
- ✓ Convenience of finding the survey sample
- ✓ Normally more accurate than cluster sampling for the same size sample

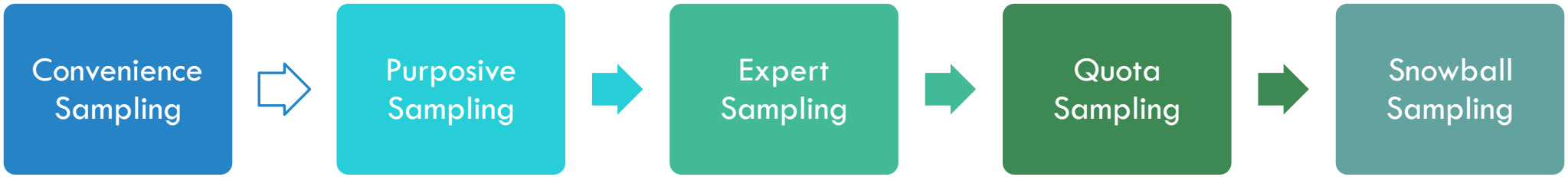
Disadvantages

- ➢ Not as accurate as Simple Random Sample[ambiguous] if the sample is the same size
- ➢ More testing is difficult to do

DIFFERENCES



NONPROBABILITY SAMPLING



WHAT IS CONVENIENCE SAMPLING/ACCIDENTAL SAMPLING? WHY USE CONVENIENCE SAMPLING?

According to Barbara Sommer at UC Davis, it could be "…a matter of taking what you can get"

ADVANTAGES AND DISADVANTAGES OF CONVENIENCE SAMPLING

Advantages

- ✓ It's relatively easy to get a sample.
- ✓ It's inexpensive, compared to other methods.
- ✓ Participants are readily available.

Disadvantages

- ❖ An inability to generalize the results of the survey to the population as a whole.
- ❖ The possibility of under- or over-representation of the population.
- ❖ Biased results, due to the reasons why some people choose to take part and some do not.

PURPOSIVE SAMPLING

Based on knowledge or professional judgement

Types of Purposive Sampling

1. Critical Case Sampling
2. Expert Sampling
3. Extreme Case Sampling
4. Homogeneous Sampling
5. Maximum Variation Sampling
6. Total Population Sampling
7. Typical Case Sampling

PURPOSIVE SAMPLING

Advantage

- It's easier to make generalizations about your sample compared to, say, a random sample where not all participants have the characteristic you are studying.

Disadvantage

- Difficult to defend your choices for participants

EXPERT SAMPLING

Involves assembling a sample of persons with expertise in some area.

"panel of experts“

Two potential reasons to use expert sampling:

- best way to elicit views of persons with specific expertise
- provide evidence for the validity of another sampling approach

Advantage: Expert judgment supports the sampling.

Problem: The “experts” may be wrong

QUOTA SAMPLING

Quota sampling is the process whereby a researcher gathers data from individuals possessing identified characteristics and quota

Advantages:

- Easy to administer.
- Fast to create and complete.
- Inexpensive.
- Takes into account population proportions, if desired.
- Can be used if probability sampling techniques are not possible.

Disadvantages:

- Selection is not random.
- Selection bias poses a problem. For example, you might avoid choosing people who live farther away, or people in rough neighborhoods. This may make the result unrepresentative of the population.

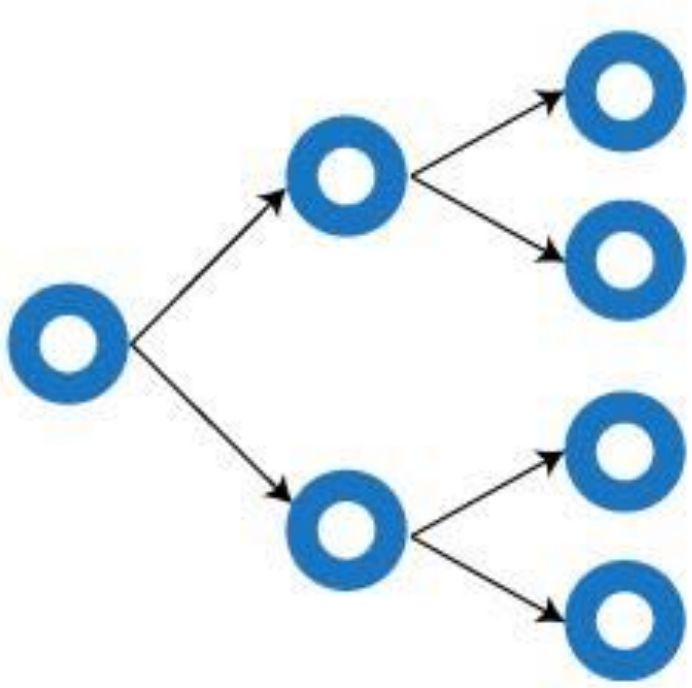
SNOWBALL SAMPLING

Snowball sampling is where research participants recruit other participants for a test or study.

SNOWBALL SAMPLING

Snowball sampling consists of two steps:

- Identify potential subjects in the population
- Ask those subjects to recruit other people (and then ask those people to recruit.



ADVANTAGES AND DISADVANTAGES OF SNOWBALL SAMPLING

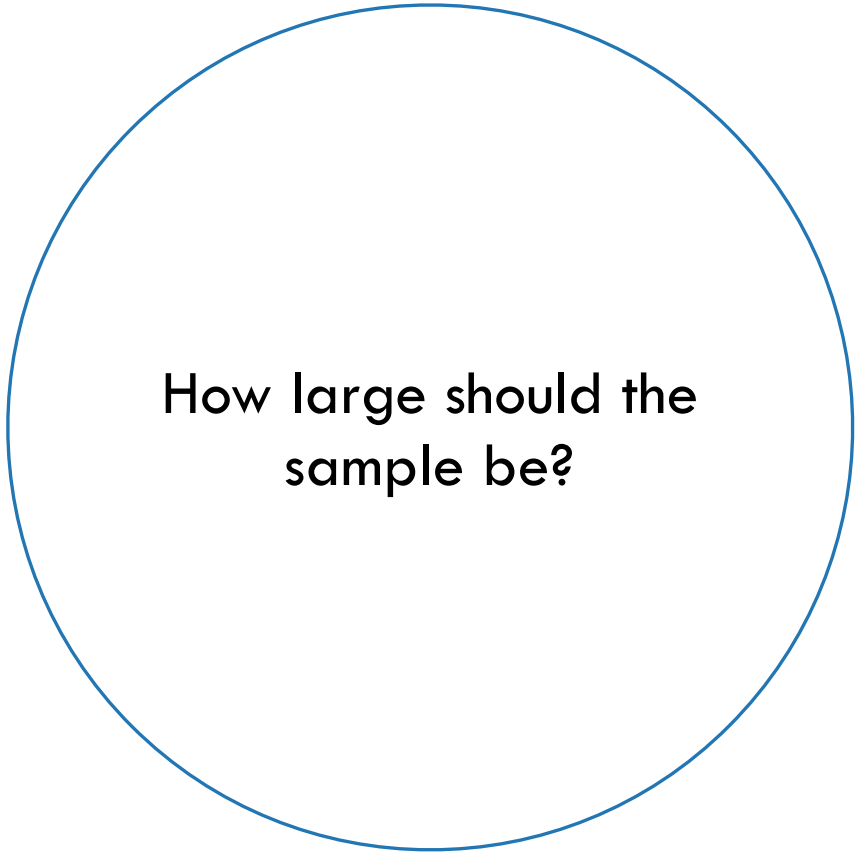
Advantages:

- It allows for studies to take place where otherwise it might be impossible to conduct because of a lack of participants.
- Snowball sampling may help you discover characteristics about a population that you weren't aware existed.

Disadvantages:

- It us usually impossible to determine the sampling error or make inferences about populations based on the obtained sample.

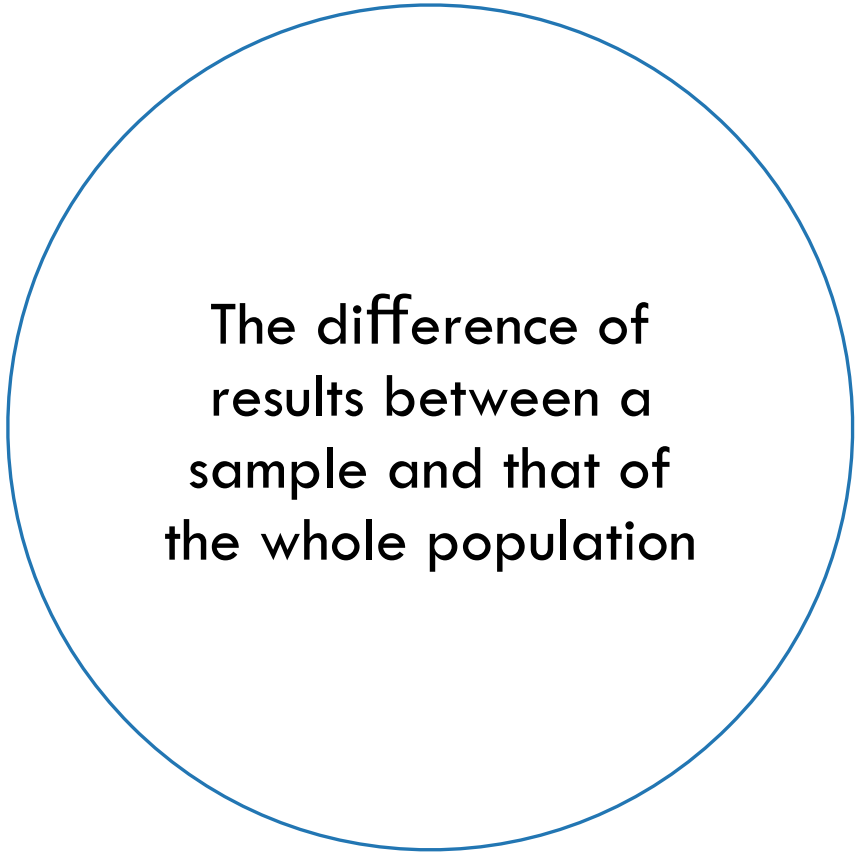
SAMPLE SIZE



Sample size depends on

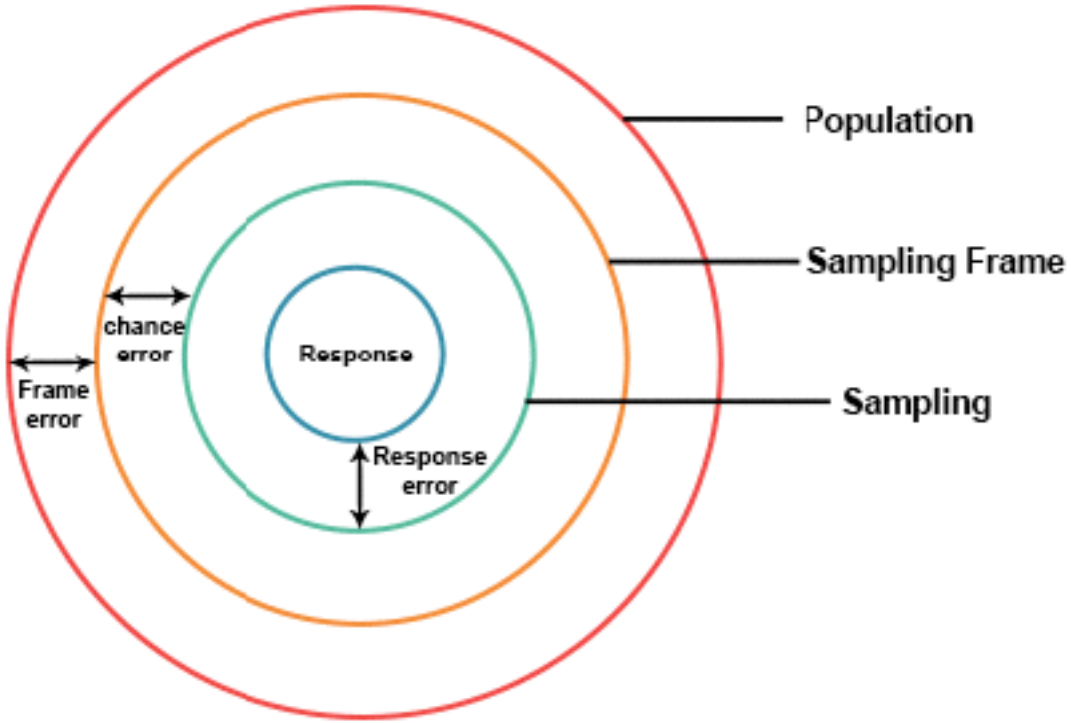
- The type of data analysis to be performed
- The desired precision of the estimates one wishes to achieve
- The kind and number of comparisons that will be made
- The number of variables that have to be examined simultaneously
- How heterogeneous the sampled population is.

SAMPLING ERROR



Sampling error is defined as the amount of inaccuracy in estimating some value, which occurs due to considering a small section of the population, called the sample, instead of the whole population. It is also called as an error in simple words.

SAMPLING ERROR



Formula for finding the sampling error:

If N is the sample size and SE is the sampling error, then

$$S.E. = \frac{1}{\sqrt{N}2} \text{x} 100$$

Sampling Error = (Frame Error) + (Chance Error) + (Response Error)

Image source: http://math.tutorvista.com/statistics/sampling-error.html

THANKS FOR YOUR ATTENTION