Sample size and sampling methods

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Contents

1. Introduction
2. Sampling methods
    a. Probability sampling
    b. Non probability sampling
3. Sample size
4. Bias in sampling

End of this session

Participants are able to:

- describe the concept of sampling methods.
- discuss issue related to the choice of sampling methods.
- decide appropriate on the sampling method for research design being develop.

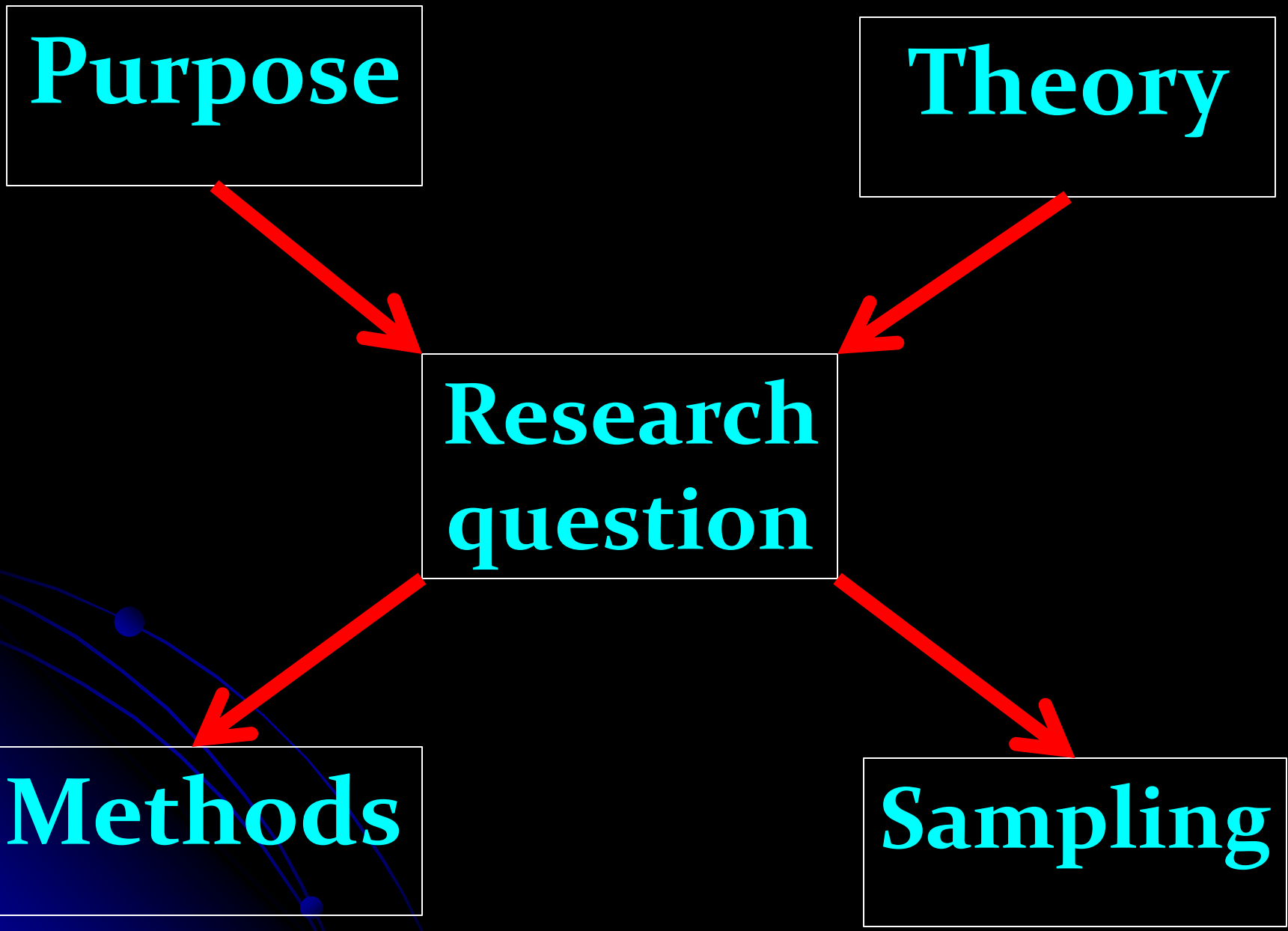
Introduction

What is sampling?

Sampling involves the selection of a number of study units from a define study population

Research design concerns the selection of the components of a research project.

Five components which are essential to the coherence of your study


Purpose
Theory
Research question
Methods
Sampling

Purpose(s)

- What is the research trying to achieve?
- Why is it being done?
- Are you seeking to describe something, or explain or understand something?
- Is it in response to a problem or issue for which solutions are sought?
- Is it hoped to change something as a result of the research?

Theory

- What theories will guide or inform your study? This includes theories associated with research traditions.
- How will you understand the findings?
- What conceptual framework links the phenomena you will study?

Research questions

- To what questions is the research being geared to finding answers?
- What do you need to know to achieve the purpose(s) of your study?
- How are the questions related to one another?
- What is it feasible to ask given the resources of time, money, manpower etc available to you?

Sampling strategy

- From whom should you seek data?
- Where and when?
- How large should your sample be?

Methods

- What specific methods/techniques will you use to collect data?
- How do these constitute an **integrated** strategy?
- How will the data be analyzed?
- What are the threats to *trustworthiness of* the data and what methods will you use to deal with these?

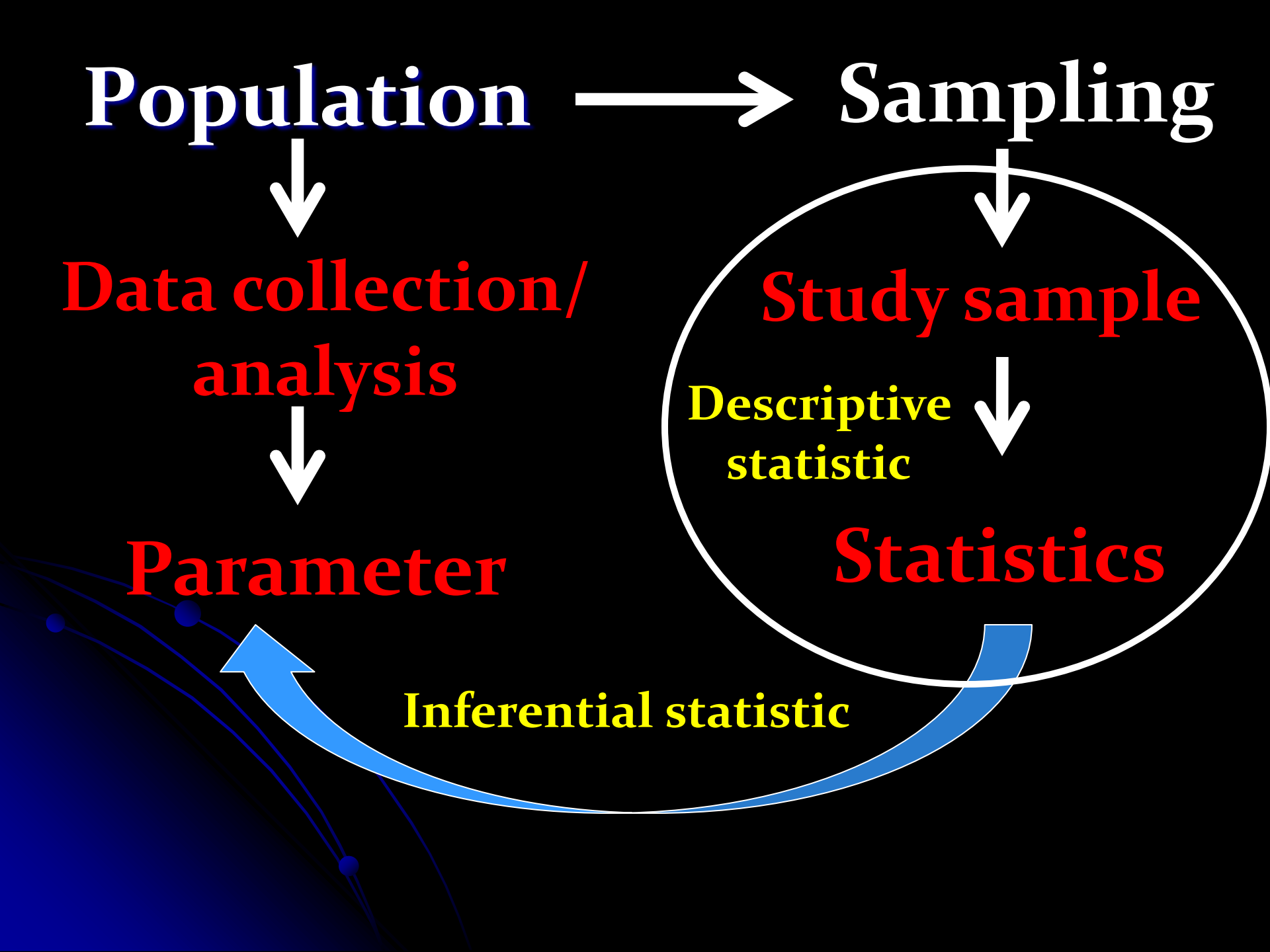
Sampling methods

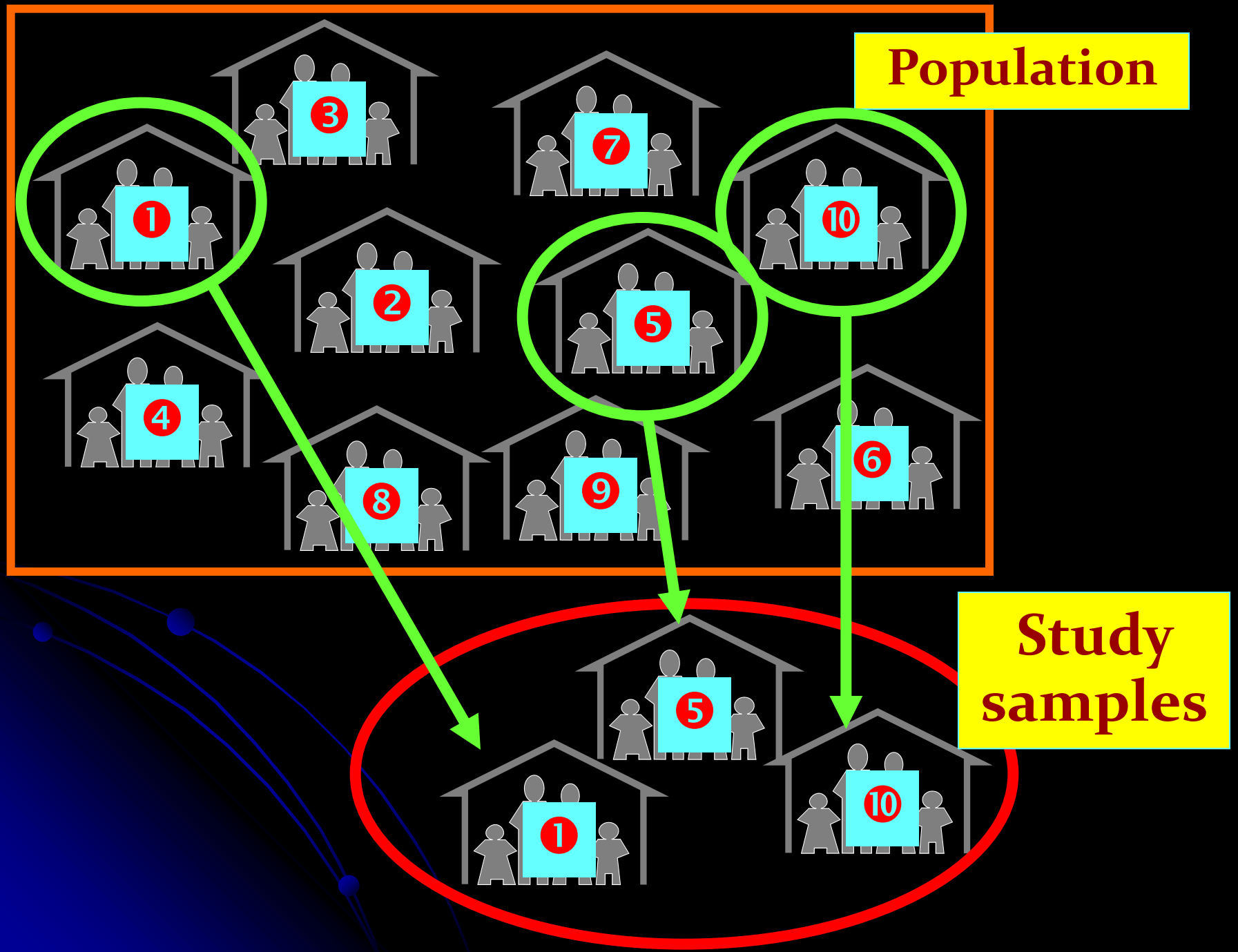
Two main types of sampling:

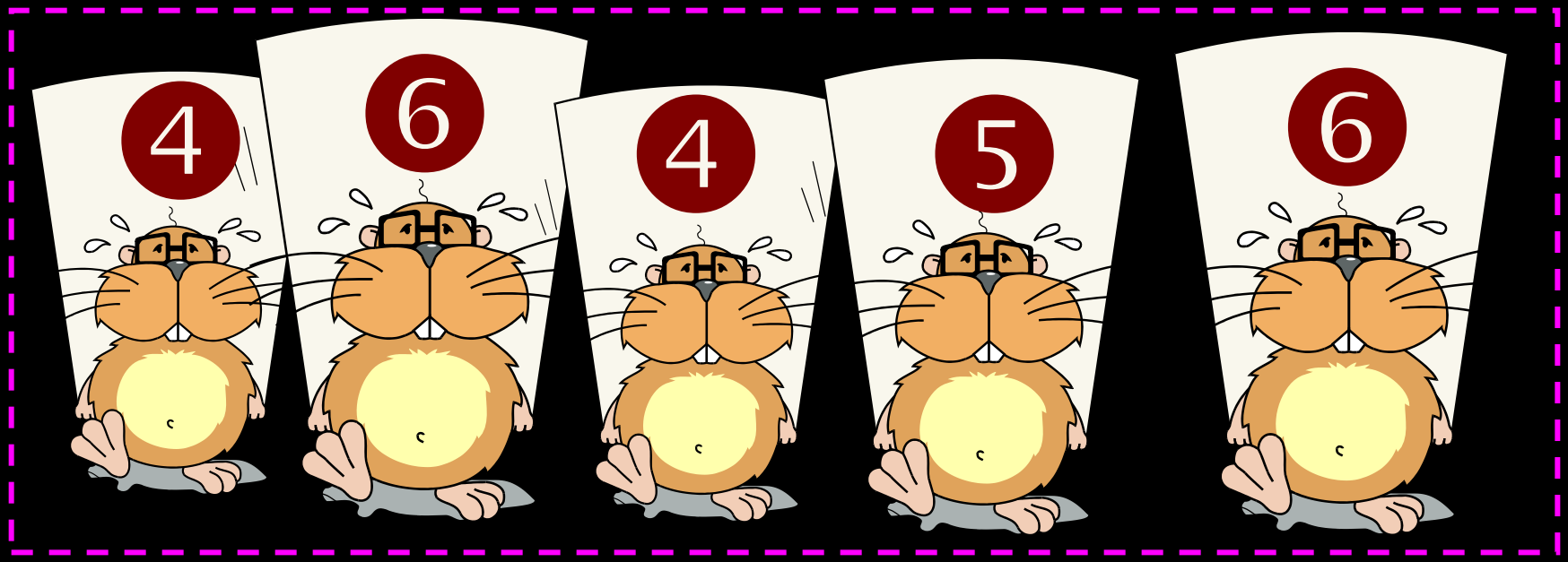
1. **Probability sampling**
2. **Non probability sampling (purposive)**

1. Probability sampling

Probability sampling is generally held to be the most precise type of sampling, but it is largely **inappropriate for qualitative research.**


Population
Sampling
Data collection/
analysis
Study sample
Descriptive
statistic
Parameter
Statistics
Inferential statistic


Population
1
3
7
10
2
5
4
8
9
6
Study samples
5
1
10

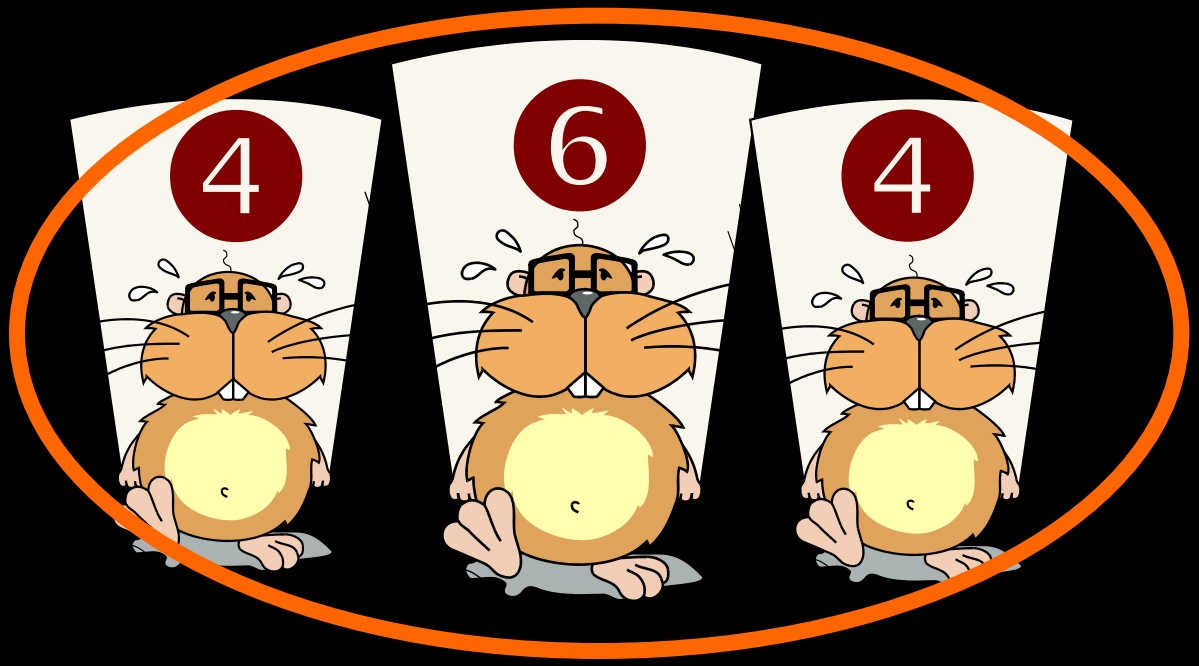


Outcome (weight)

Parameter

Mean

$$\frac{4+6+4+5+6}{5} = 5$$



Study samples

Mean

$$\frac{4+6+4}{3}$$

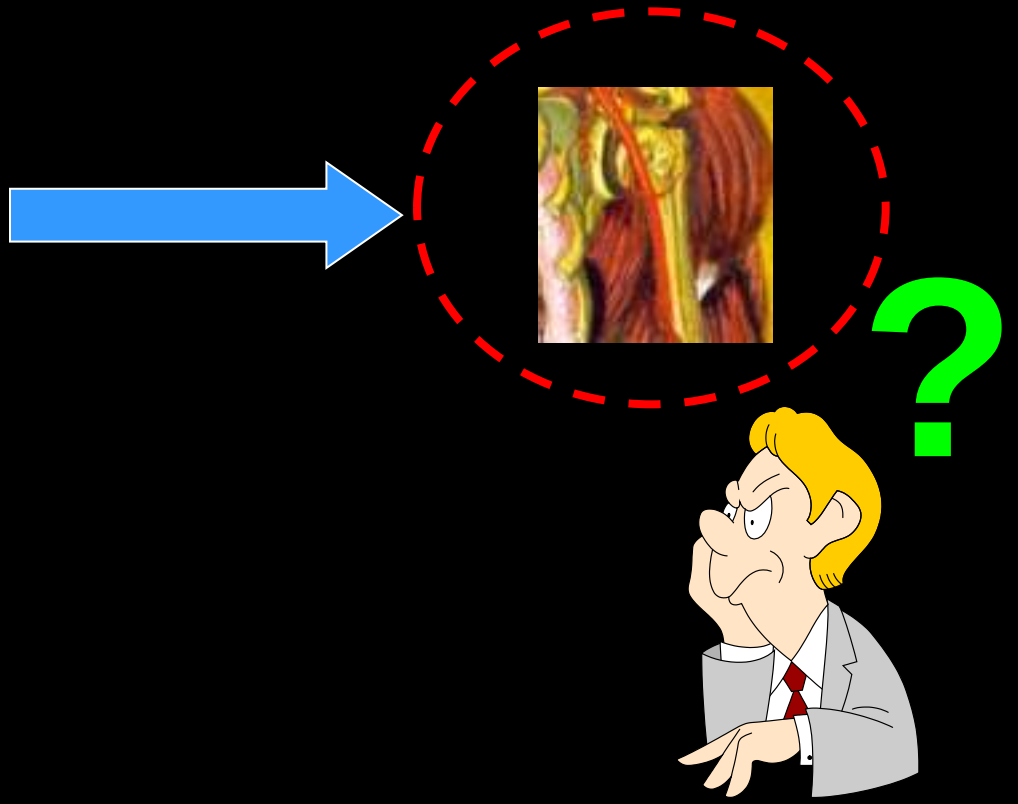
4.67

Statistics

Representative sample

If researchers need to draw a conclusion valid for the whole study population, they should draw a sample in a way that it is representative of that population

Drawing blood sample



Probability sampling

- Simple random sampling
- Systematic sampling
- Stratified sampling
- Cluster sampling
- Multi stage sampling

Calculation sample size

1. Target population is known
2. Target population in unknown

In case of the target population is unknown

$$n = \frac{Z^2_{\frac{\alpha}{2}}\, p(1-p)}{e^2}$$

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$p = 0.05$

$Z_{0.025} = 1.96$

$e = 0.01$

$n = 1824.7$

$n = 1825$

In case of target population is known

$$n = \frac{N Z_{\frac{\alpha}{2}}^{2} p(1-p)}{e^2(N-1)+Z_{\frac{\alpha}{2}}^{2} p(1-p)}$$

2. Non probability sampling

In qualitative research non-probability sampling is used for **selecting the population to study**

Because qualitative research is usually focused on a small number but the selection of participant and research sites is crucial to the overall usefulness of the research findings.

Purposive full for qualitative studies

1. Convenience sampling
2. Maximum variation sampling
3. Snowball sampling
4. Typical case sampling
5. Theoretical sampling

Convenience sampling

Lacks any clear sampling strategy: the researcher selects the sample according to ease of access.

Maximum variation or heterogeneous sampling – a prominent strategy.

Here there is a deliberate strategy to include characteristics that vary widely from one another. The aim is to identify central themes which cut across cases/informants.

Snowball sampling

You start with one or two information rich informants and ask them if they know persons who know a lot about your topic of interest or who represent the characteristics you are interested in.

Critical case sampling

Cases are selected because they demonstrate a phenomenon or position ‘dramatically’ or are pivotal to the delivery of a process or operation.

In qualitative study

Talk about **transferability or extrapolation rather than generalization** and leave it up to someone else to decide whether they want to **transfer or extrapolate your findings to another** setting or population.

Bias in sampling

What is bias in sampling?

Bias in sampling is a systematic error in sampling procedures that lead to a distortion in the result of the study

Thank you