Year 2024 · Subject · Research

Introduction to Research Methodology

&

Descriptive studies

Official Email:

Mobile (Optional):

Academic Hours :

Learning Outcomes

1 **Define research and enumerate steps in research design** (Competency Area VI/Key 6.7).

2 **Identify types of epidemiological studies** (Competency Area VI/Key 6.7).

3 **Define descriptive studies, uses, types, characteristics, advantages and disadvantages** (Competency Area VI/Key 6.8).

Case Scenario

Hepatitis B and C Seropositivity among Nursing Students at a Turkish University:

Background: In particular, healthcare workers are at high risk for contracting viral hepatitis. Therefore, preventive measures to minimize occupational exposure to blood borne pathogens are needed to protect both health care workers and nursing students. **Objectives:** The study was conducted to determine the prevalence of Hepatitis B and C infections among nursing students. **Methods:** Venous bloods were obtained from nursing students and were serologically tested using the ELISA method. A questionnaire form was also used to obtain data related to demographic and socio-economic characteristics of the participants. **Results:** 0.7% of the nursing students were serologically positive for HBsAg, 17.0% for Anti-HBs and 7.5% were positive for Anti-HBc (IgG).

1. **What is the type of this epidemiologic study?**

2. **What does the underlined number signify?**

Learning Outcome **1**
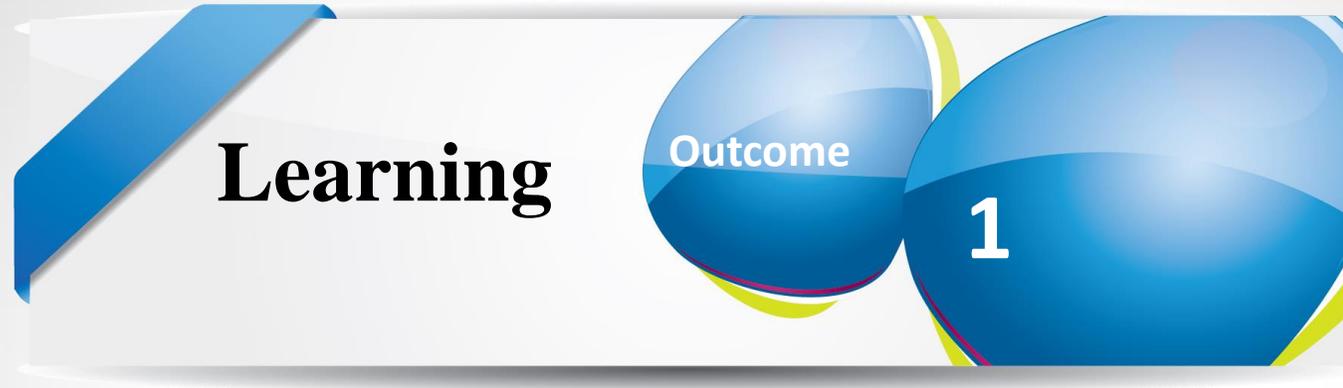
LO1: Define research and enumerate steps in research design.

Definitions

مقطع **RE** معناه إعادة ومقطع **search** معناه بندور

Research

→ **Re :** again, a new, or over-again

→ **Search:** to examine carefully, to test & try, or to probe

Systematic:

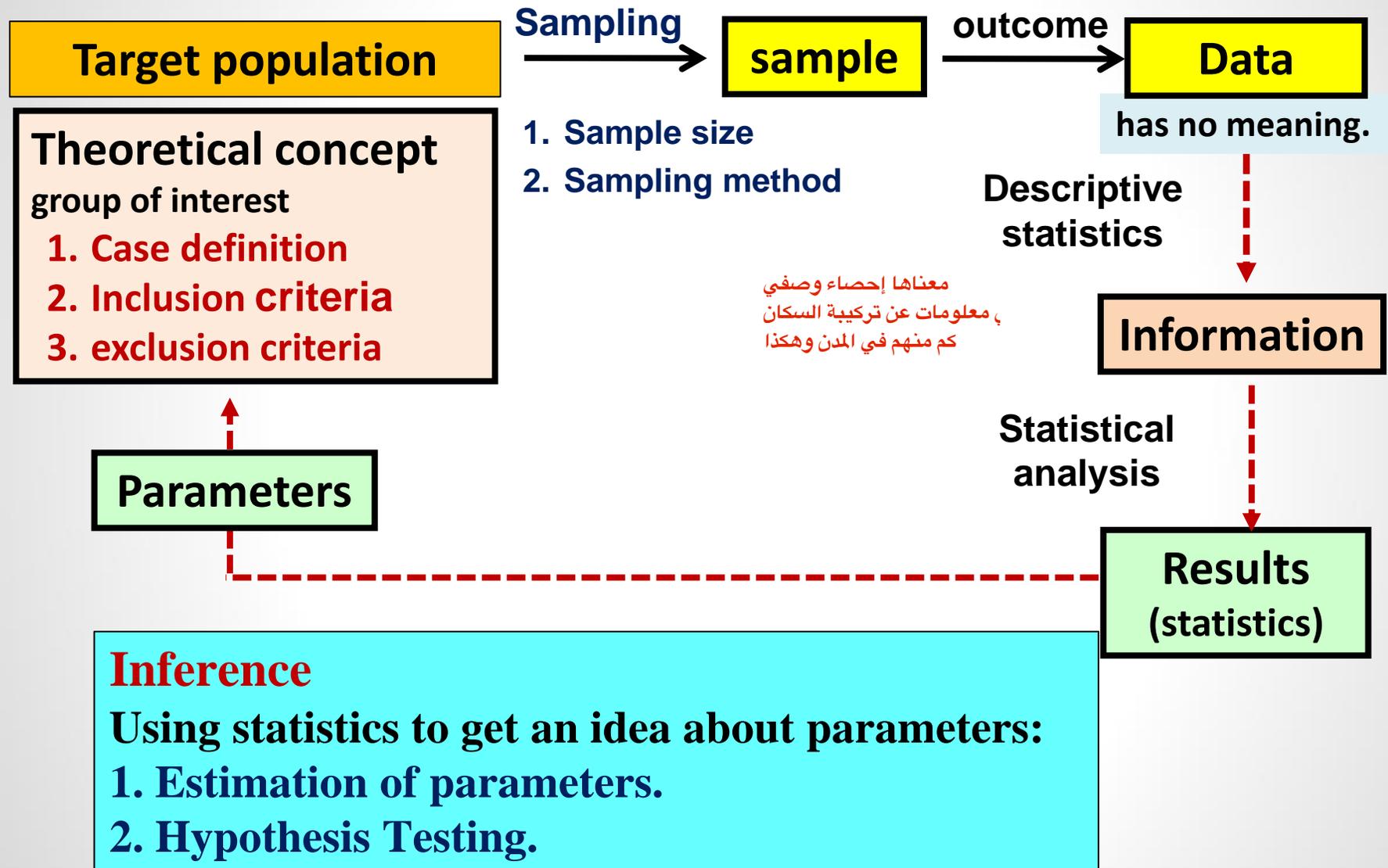|		
1. Collection 2. Description 3. Analysis 4. Interpretation	of data to	1. **Answer** a question 2. **Solve** a problem. 3. **Generate** knowledge

Parameters and Statistics:

Example:

Population: 2, 5, 8, 5, 4, 6

Population mean (parameter) = 5

A sample of 3 :   2, 5, 5 → **Sample mean (statistic) = 4**

Another sample of 3: 2, 8, 6 → **Sample mean = 5.33**

Research Design
The 8 steps model

A. Steps in planning research study:

Step 1: Formulate a **research problem.**

كمثال هل طلبة الأهلية داخلين بالغش 😃

Step 2: Research **design.**

الطريقة اللي هنتبعها
عشان نوصل لحل المشكلة

Step 3: Construct **tools** for data collection.

عينة دم او مجرد اسئلة او اياً كان الطريقة اللي
هتجمع بيها داتا

Step 4: Select a **sample (size & method).**

عينة تمثل التركيبة اللي عايزين نعمل عليها
الدراسة وتحسب بطرق معينة

Step 5: Write **research protocol (proposal).**

بنكتب الخطة بتاعتنا
(المشكلة والtool والsample وكل حاجة)

B. Steps in conducting study:

Step 6: Collecting data.

تجميع الداتا بالأدوات

Step 7: Processing data.

تنقية وتلخيص وترتيب واي حاجة بتتعمل عشان
ننظم الداتا اللي جمعناها

Step 8: Writing research report.

تقرير البحث،
بالintorduction والmethods والresults وال
discussion

Aim of the study:

☐ A broad statement describes **what** you want to do.

☐ your **overall intention** in the study.

☐ usually written **with the following action verbs**:

- To assess.
- To evaluate.
- To investigate.
- To understand.
- To explore.

- To test.
- To determine.
- To develop.
- To design.

e.g. **This study is conducted to assess the nutritional problems among primary school children.**

Objectives:

☐ How you are going to achieve aims.

☐ Don't use vague statements **as to** investigate' or 'to explore'.

☐ Usually written **with the following action verbs**:

- To **collect**.
- To **construct**.
- To **produce**.
- To **test**.

- To **measure**
- To **analyze**.
- To **document**.
- To **trial**

Objectives: should be **SMART**

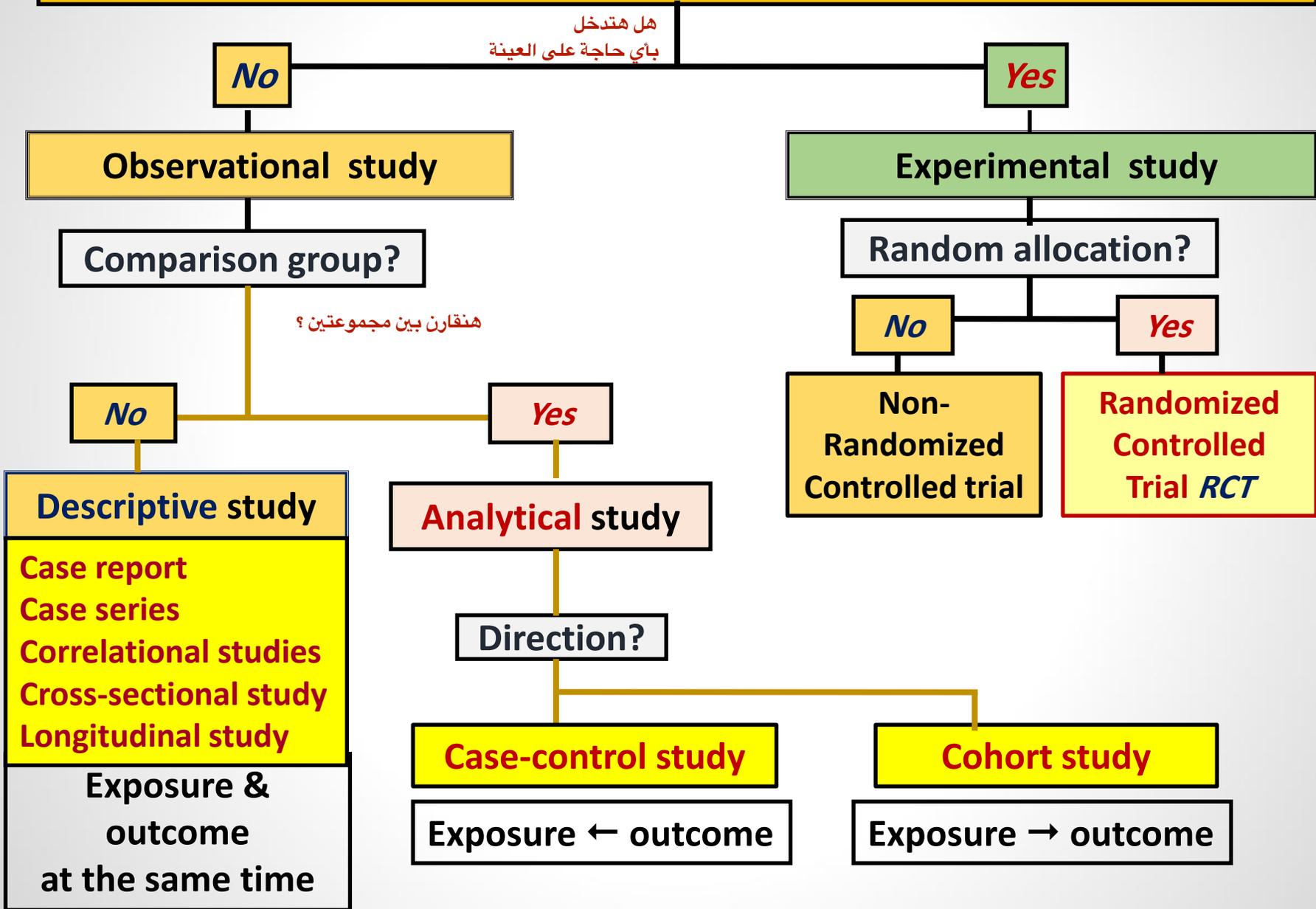|	
S	Specific
M	Measurable (effect size)
A	Applicable, achievable, agreed
R	Relevant (realistic)
T	Time-bound (Timely, a time frame & end point)

Learning

LO2: **Identify types of epidemiological studies.**

Case-control study

Exposure → outcome

Risk factor → Disease

Cohort study
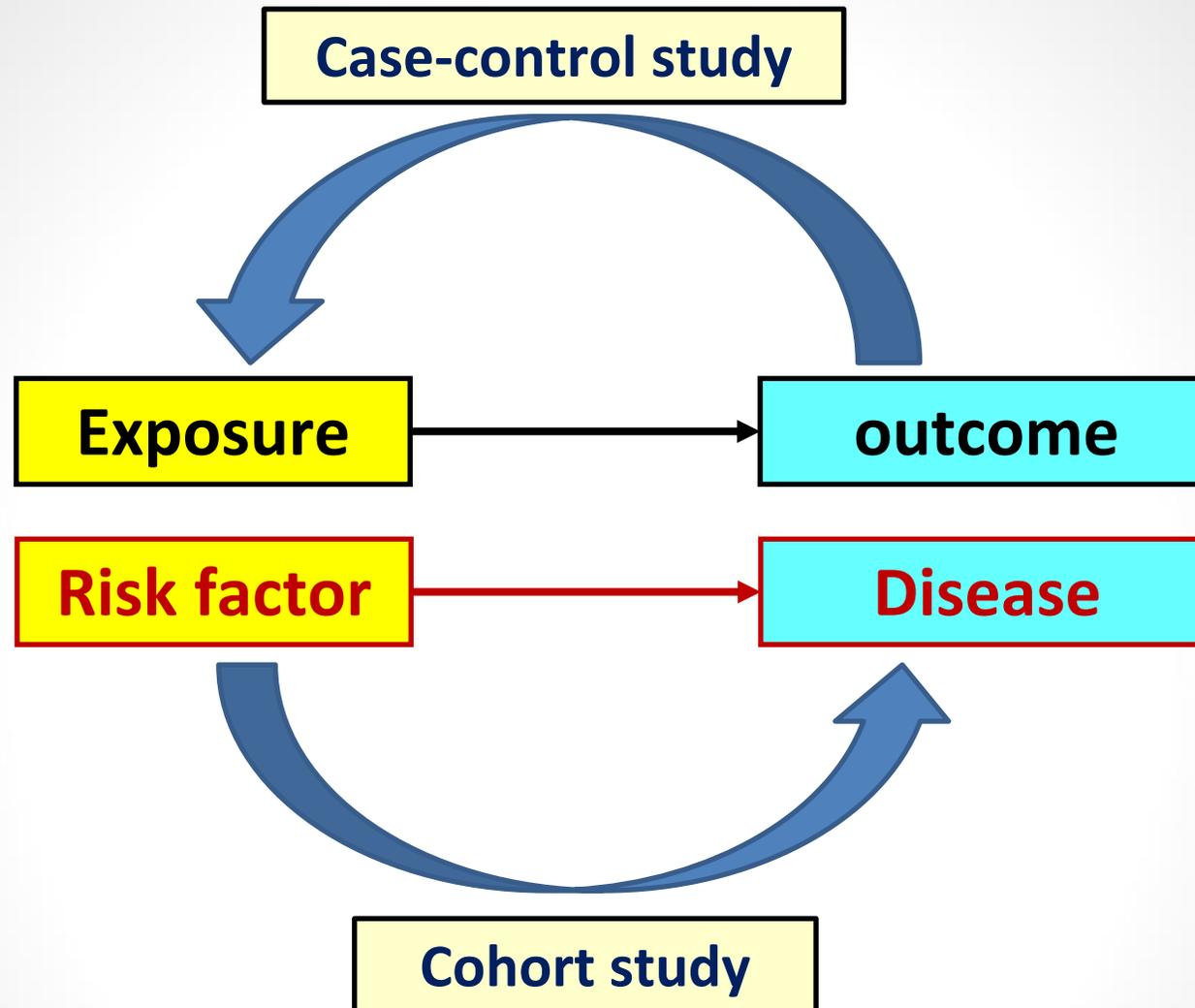
- **Smoking** & lung cancer.
- **Forceps delivery** & childhood epilepsy.
- **Oral contraceptive pills** & DVT.
- **HCV** & Hepatoma.

Learning Outcome **3**

LO3: Define descriptive studies, uses, types, characteristics, advantages and disadvantages.

Descriptive Studies

"The first toe in water"

Uses:

❑ **It is the first phase in the epidemiological investigation.**

❑ **Describing** the **pattern**, **characteristics** and **distribution** of a disease or health problem in the population.

❑ **Give data about when the disease occur (Time), where the disease occur (Place) and who is getting the disease (Person).**

❑ **Formulating (not testing) research hypotheses** (It is the 1st step in the search for determinants or risk factors).

Types:

1. Case report.
2. Case-series.
3. Ecological (correlational) studies
4. Cross-sectional study
5. Longitudinal studies.

Types of descriptive studies:

1- Case Reports:

حالة واحدة طبية بتكون فريدة وغير اعتيادية
(جاي بأعراض جديدة غير معروفة لمرض معين مثلا)

Detailed presentation of a single case **reporting a new** or **unique finding**, e.g.

➢Newly described disease.

➢Unexpected or new therapeutic effect.

➢Link between diseases.

2- Case Series:

➢ **Describe a number of similar cases with a given disease** in one report**.**

➢ **May describe unusual variations of a disease and May indicate the start of an epidemic.**

➢ **A major trigger for further research.**

3- Ecological studies:

➤ **Looking for** associations (**correlation**) between **exposures & outcomes** in <u>population</u> rather than in individuals.

➤ **Use already collected population data** (e.g. vital statistics, censuses and national health surveys).

➤ **Comparing populations in different places at the same time or in a time series by comparing the same population in one place at different times.**

Examples:
- Mortality from CHD & per capita sales of cigarettes.
- High incidence of MI & consumption of dietary fat & fast food.
- Negative correlation between access to efficient ANC & maternal mortality rate.
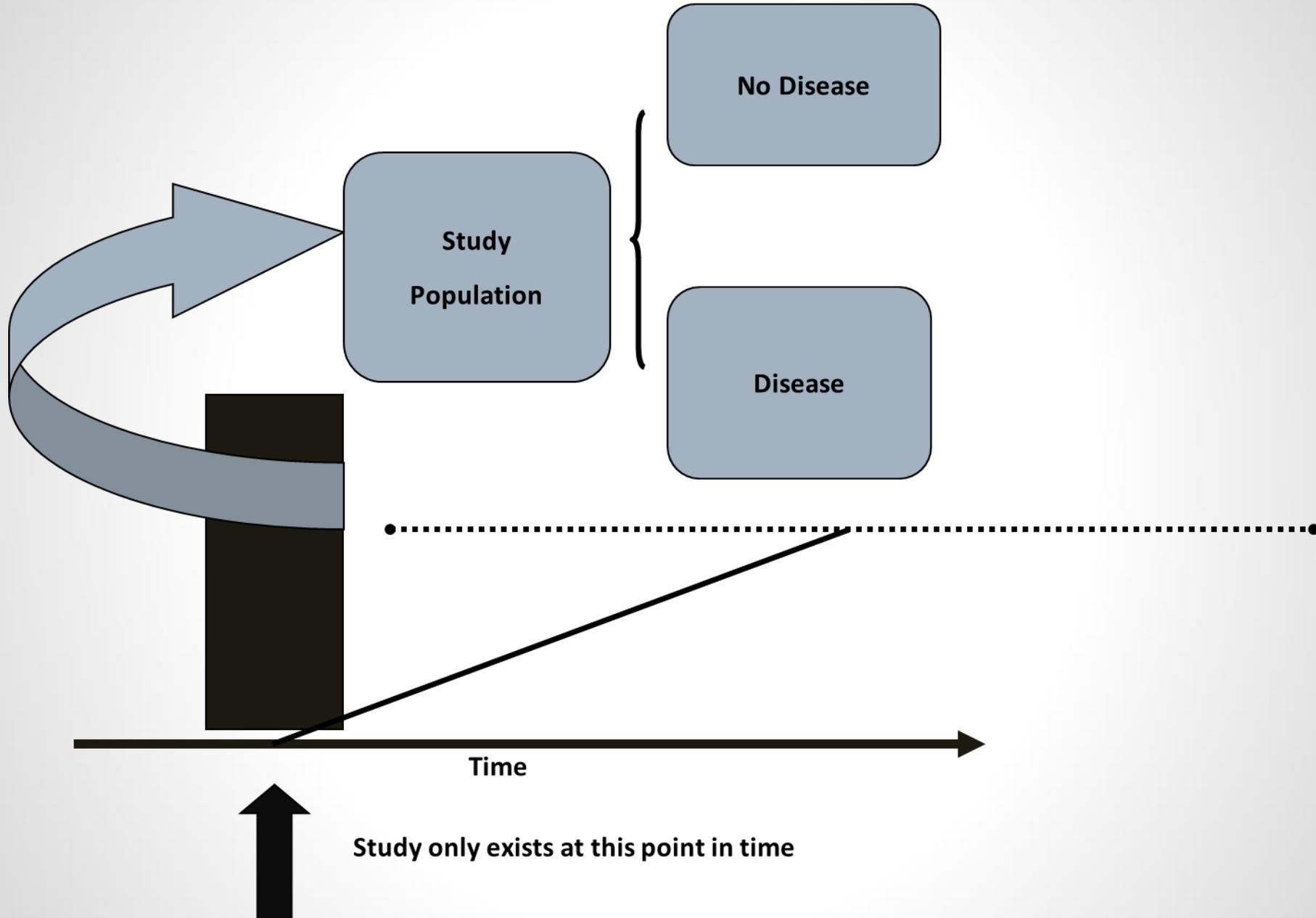
4- Cross-Sectional (Prevalence) Studies:

➤ **It is observational** study that **carried out once** (snapshot of a population) at **a single point in time.**

➤ Both **exposure** (risk factors) and **outcome** (diseases) **are present (**we cannot determine if exposure preceded disease or not).

➤ It measures **prevalence**, not incidence of disease.

دراسة بتتعمل مرة واحدة (بسأل كل شخص مثلا إذا عنده مرض معين ولا لا وخلاص بس، وبسجل كم واحد عنده وكم معندوش)

ودي تعتبر اهم واحدة فيهم ودي بتكون بداية الأبحاث في الغالب
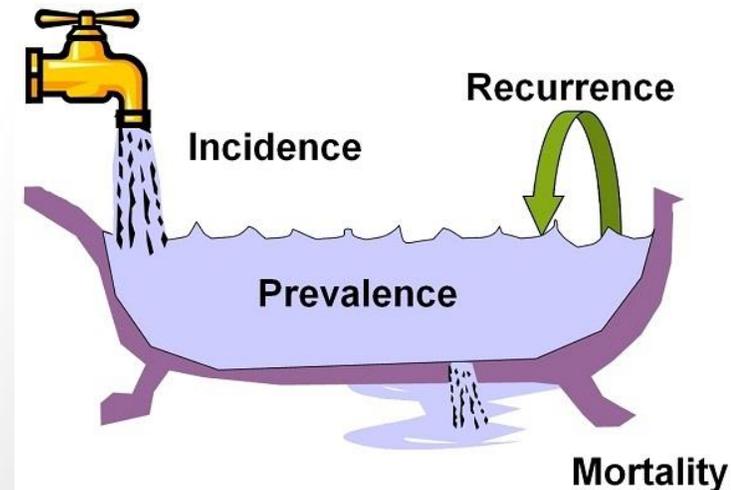
4- Cross-Sectional (Prevalence) Studies:

Uses:

1. **Used to study prevalence** rates of chronic diseases.

2. **Used to study disease load** in community and its distribution in subgroups.

3. **Screening** for unrecognized cases. أهم استخدام

4. **Detection of association** between risk factors & diseases.

Advantages Cross-sectional Studies	Disadvantages Cross-sectional Studies
1. Useful to study conditions that are relatively frequent with long duration (**non fatal**, **chronic conditions**).	**1. Not useful for studying:**
	- Acute diseases.
	- Diseases with seasonal variations.
	- Highly fatal diseases.
2. Good for generating hypotheses about the cause of disease.	**- Rare diseases.**
	- Disease with short duration.
3. Can estimate:	**2. Can't estimate incidence rate.**
- **Prevalence rates.**	
- **Exposure proportions.**	**3. It gives very little information about the natural history of diseases.**
4. No follow up, relatively easy, quick and inexpensive.	**4. Cannot determine if exposure preceded disease** or not.
5. It is the first step to develop causal association.	**5. Not differentiate between causes** of disease & **factors associated** with disease.

5- Longitudinal (incidence) studies:

Repeated observations (follow-up) in same community over prolonged period to identify new cases of disease.

Follow up and re-examination have the following problems:
1. **Loss to follow-up.**
2. **Difficulty in maintaining standards and stability of clinical and laboratory examination over a long period of time.**

It is used to measure:
1. **Incidence rate.**
2. **Natural history of dis. & its final outcome (case fatality, survival).**
3. **Risk factors of disease.**

☑ Case report: One case of unusual disease/injury finding .

☑ Case Series: Multiple cases of disease/injury finding.

☑ Correlation studies: Entire population data.

☑ Cross sectional studies: Single examination of a cross-section of population at certain point of time (prevalence).

☑ Longitudinal (incidence) studies: Repeated observations (follow-up) in same community over prolonged period to identify new cases of disease.

Summary & Wrap up

Questions

Question 1: The careful detailed report that is given by clinicians to profiles a single patient's case is called:

A. Case report.
B. Case series.
C. Correlation study.
D. Cross-section study.
E. Cohort study.

A

Question 2: Which of the following is useful to study the non-fatal and chronic conditions and not suitable to study the rare disease or disease with short duration?

A. Case report.
B. Cohort study.
C. Correlation study.
D. Case series study.
E. Cross-section study.

E

Question 3: Which of the following is known as prevalence study?

A. Case series.
B. Case report.
C. Case-control study.
D. Cross-section study.
E. Cohort study.

D

Question 4: First step of research process:

A. Formulate a research problem.
B. Research design.
C. Construct tools for data collection.
D. Select a sample (size & method).
E. Write research proposal.
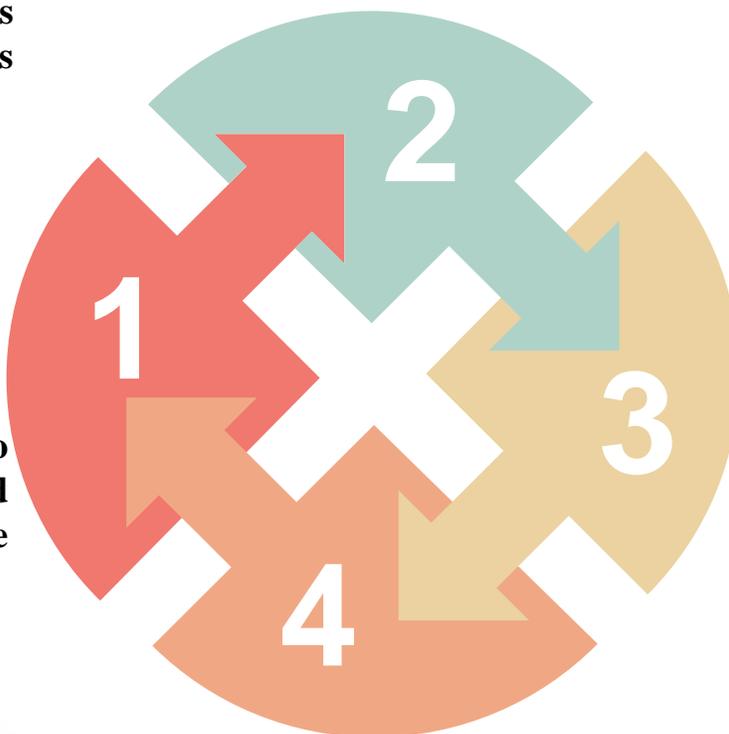
A

Discussion & Feedback

10 minutes

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