

# Statistics for Public Health Research

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## Lecture 1

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# What is Statistics ?

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- *Statistics* is a group of methods used to collect, analyze, present, and interpret data and to make decisions.



# Examples of Some Statistics

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- The number of educated people in AL-Baha City.
- The number of homeless in the United States of America.
- The number of cars in Saudi Arabia.
- The cost of health care services in Saudi Arabia

# What is Bio-Statistics ?

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- *Bio-Statistics* is a group of methods used to collect, analyze, present, and interpret of biological, medical, and public health data to make decisions.

# Examples of Some Biostatistics Data

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- The number of diagnostic tests in the hospital
- The number of hepatitis cases in the region
- The number of cancer deaths in Saudi Arabia.
- The number of infectious diseases in Saudi Arabia.



# What are The Types of Statistics ?

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## Descriptive Statistics

*Descriptive statistics* consists of methods for organizing, displaying, and describing data by using tables, graphs, and summary measures

# Example of Descriptive Statistics

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- The test scores of students enrolled in a biostatistics class.
- In statistical terminology, the whole set of numbers that represents the scores of students is called a **data set**.
- The name of each student is called an **element**, and the score of each student is called an **observation**.

**Elements  
Member**

**Student's Name**

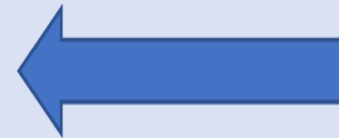
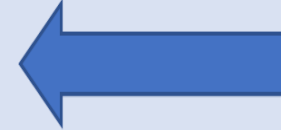
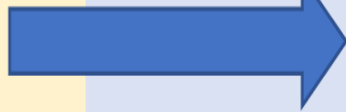
Ahmed  
Ali  
Saleh  
Mohammed  
Khalid

**Scores**

20  
21  
18  
15  
16

**Variable**

**Observation  
Measurment**





In statistics, the collection of all elements of interest is called a **population**.

**E.g. The number of all diabetic patients in AL-Baha City.**

The selection of a few elements from this population is called a **sample**

**E.g. The number of diabetic patients in a primary health care  
(A)**

**Population** / consists of all elements, individuals, items or objects whose characteristics are being studied

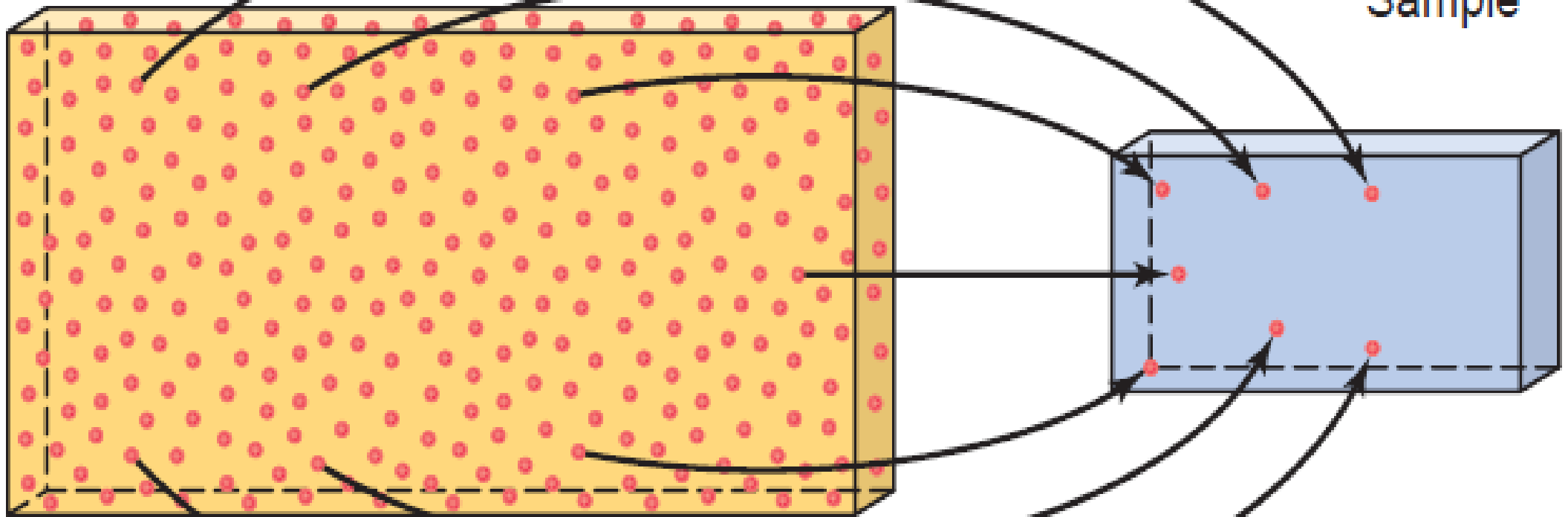
**Sample** / A portion of the population selected for study

**Census** / A survey that includes every member of the population.

**Sample Survey** / The technique of collecting information from a portion of population

Population

Sample





# What are The Types of Statistics ?

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## Inferential Statistics

*Inferential statistics* consists of methods that use sample results to help make decisions or predictions about a population.

# Example of Inferential Statistics

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- The starting salary of a college graduate. We may select a sample of 1000 recent college graduates.
- Look at to the starting salaries to make a decision based on this information.

# What is The Meaning of Variable ?

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- It is a characteristic under study that assumes different values (scores of students in biostatistics) for different elements (students in college of applied health sciences)



# What are The Types of Variables ?

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- **Quantitative variables** / It can be measured numerically

Types of quantitative variables

**1- Continuous variable** / Any numerical values over a certain interval or intervals (Should has a decimal)

E.g. ( Length, age, height, weight, time, and blood cholesterol)

# What are The Types of Variables ?

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- **2- Discrete variable** / Only a certain numerical values with no intermediate values (Never has a decimal).
- **E.g. ( Number of cars, houses, and accidents )**

# What are The Types of Variables ?

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- **Qualitative variables** / It can not be measured numerically

Types of qualitative variables

**1- Nominal variable** / It is another name for a categorical variable

E.g. ( Occupation, type of disease, type of cars )



# What are The Types of Variables ?

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**2- Ordinal variables** / They have ordered categories

E.g. ( Severity of disease, socioeconomic class, level of education)

Low – Middle - High

Mild – Moderate - Severe

# What are The Types of Variables ?

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**3- Binary variables** / They have only two categories

E.g. ( Gender : Male and Female)

Question answer ( True, False )

Question ( Yes, No )

# Reference

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- Prem S. Mann 1998, Introductory Statistics, 7<sup>th</sup> edn, New York, USA.



# Good Luck for All Students

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- Please do not hesitate to contact me if you have any questions.
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# سبحان الله وبحمده سبحان الله العظيم

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ذكر الله أعظم ما في الوجود ،، لعل الله يرحمنا بعلم تعلمناه في الحياة الدنيا

أستغفر الله