بسم الله الرحمن الرحيم

السلام عليكم ورحمة الله وبركاته

Biostatistics

L I
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: Biostatistics

❑ **The terms/concepts:**

❖　**Variable**

❑　**Distinguish between**

▪　　**Nominal**

▪　　**Ordinal**

▪　**Discrete**

▪　**continuous variable**

▪　**Distinguish between quantitative and quantitative data**

❖　**Frequency distribution**

❖　**Relative frequency**

❖　**Cumulative frequency**

✓**Transform data set into information in the form of**

➢　**Tables,**

➢　**Graphs**

Biostatistics consist of

1-Collection of data .

2-Presentation of data

3-.Estimation of data

Statistics

Is a field of study that concern with

The **Collection** ,**Organization** and **Summarization** of data

And

Drawing of **inference** about a body of data when only part of data are observed

Biostatistics

When data being analyzed are derived from biological sciences, and Medical observation .

> **Biostatistics** Is a field of study that concern with the **Collection** Organization and Summarization of data. **Drawing o**f inference about a body of data when only part of data are observed

Biostatistics breaks into two main distinct components or two distinct subcategories:

I- Descriptive Biostatistics.

II- Inferential Biostatistics.

I Descriptive Statistics

It is a series of procedures designed to clarify the data ,
                                    so that

its **principal** characteristics and
                    main features.   **are revealed**

❑   **for the purpose of**

                    conclusion at a late stage.

This one serve as devices   for

➤ *organizing and summarizing data*
                                    and
➤ *bringing into a focus their essential characteristics*
➤ **Reduce the information to a manageable size**

This include

This include:

Presentation of data by

1.   **Graph and or**

2.   **Tables**

3.   **Calculation or numerical summaries, such as** Frequency, Average, Mean, Median, Mode Percentages

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Data??

Descriptive statistics

Data

❖ **Data are <u>the values</u> you get when you measure a variable example**
20 years old, (age)
55 males.   (Sex)
170   cm height

▪ **The <u>values</u> of the observations for the variable is known as data.**

❖ **Data are the raw material of statistics**
❖ **Data carry little or no meaning when considered alone**
▪ **needs further steps to become valuable (information)**

❖ **Data consist one or more variable**

Variable ???

Variable (Y)

It is the **characteristics** ,that observed in:

persons, places or **things** .

This characteristic **is not the same** when observed in different possessors

It is any aspect of an individual that is measured   Like;
B.P. cholesterol age, sex ,Blood sugar **?????**

Variable

is some thing whose value can vary

example

age ,sex, weight height??????

An important thing is the type of the variable concerned

Type of variable

 There are two major types of variable
Each of these can be subdivided into two subtypes

1.Categorical variable
(Qualitative Variable)

1.Categorical variable
a- Nominal
b- ordinal

2 Metric variable
(Quantitative Variable)

2 Metric variable
a-Continuous
b-Discrete

1. Categorical variable
a- Nominal

Example

Blood group of 100 persons Just categorize the blood group into

A,   B, AB, & O

then counting the No. of individuals (frequency)

in each group

(1) Data do not have any unit

(2) ordering of the categories is   completely subjective

AB, A,   B,& O

O, AB, A & B

b- Ordinal ترتيبي

example

grading of tumor I II III IV V

the order category in a meaningful

The difference between any adjacent two grades is not necessarily be the same (equal)

Therefore

1-the data are _not properly measures_

but

assessed in some way

❖**2-_these data are not real numbers_ and**

as it is not real data

3--we cannot apply any arithmetic's roles

no adding,

no subtracting.

no multiply or

no divide

the ordinal vales

❖**4- Data do not have any unit**

❖**5- ordering of the categories is not subjective**

the order category in a meaningful way

➢**difference between any adjacent two grades is not**

necessarily be equal

➢ **Have no *interval property***

2   Metric variable

Continuous variable

Example **Height ,Weight**

1-usually comes from measuring Can be properly measured

so

2- they are a real numbers

so

3- we can apply all mathematics' operations

4- All have units of measurement attached to them

5-The difference between any pairs of adjacent values are exactly the same (equal) this is

known as   the *interval property*

50-60-70-80

Can be properly measured

may assume any value along a continuum .

The value of a C.V. is **not limited** **to the set of** **integers**
.Height :158,160,
                  157.9 , 16o.6   160.68

dose **not** possess a **gap** or interruptions.
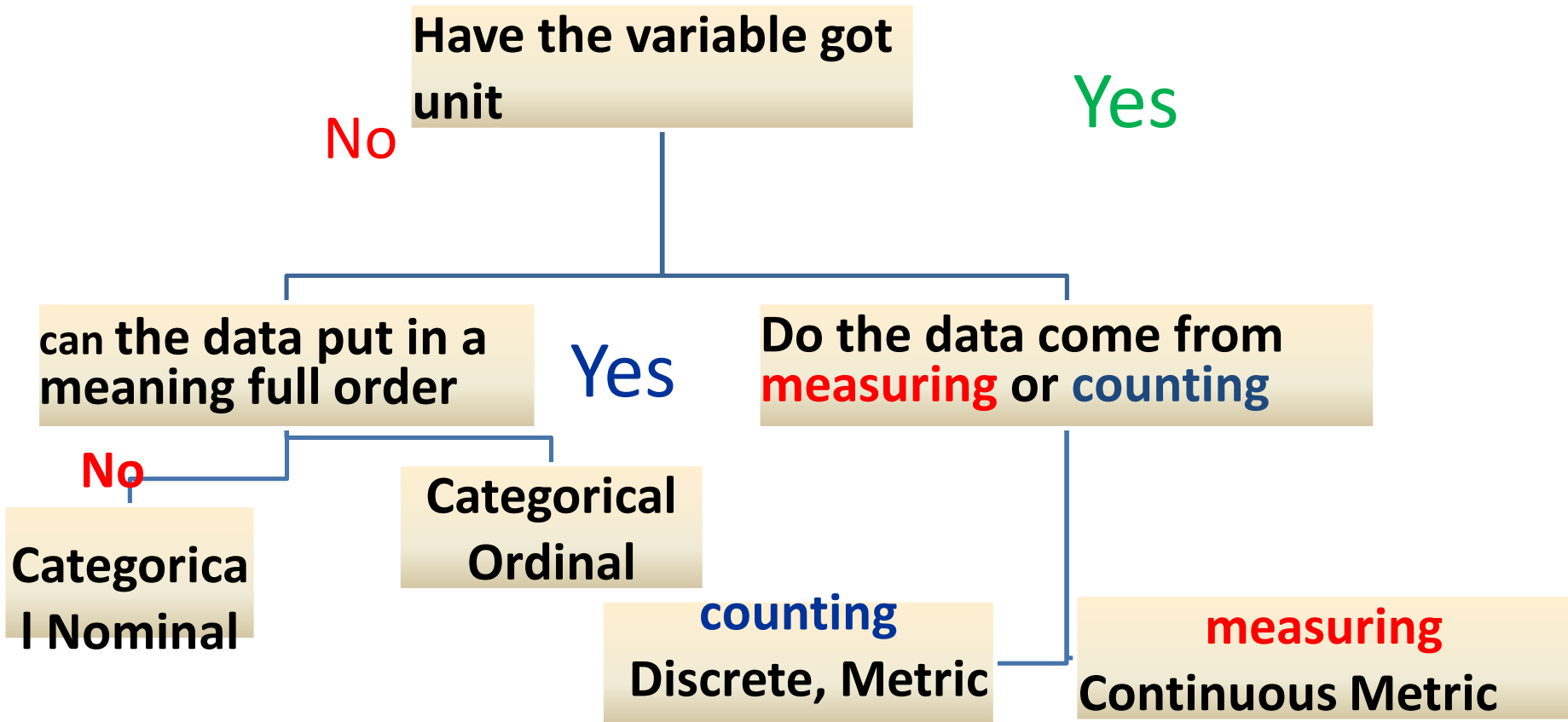

    ex.
      B.P.   Hb   Blood sugar .
??????????

2 Discrete variable

usually comes from **counting** such as

   No. of death.

   No. of students

No. of patients

    ??????

2 Metric variable
   a-Continuous
   b-Discrete

all are
discrete metric variable

❖ It is real numbers **So……..???**

❖ It can be counted

❖ It have a unit of measurements

❖ It is **integer,** measurement or values **are integers**

❖ They have the same **interval and ratio properties** as the continues variables

Have the variable got unit

No   Yes

can the data put in a meaning full order   Yes   **Do the data come from measuring or counting**

No

Categorical Nominal

Categorical Ordinal

counting Discrete, Metric

measuring Continuous Metric

An important thing is the type of the variable concerned.

Quantitative Variable

The one that can be measured by the usual sense .

Qualitative Variable

The one which are not capable of being measured by the usual sense .

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age of 50 patients

68, 62, 62, 66, 68, 65, 64, 71,77, 74, 20, 33,
38. 42, 47. 50,55, 56, 60 72, 80 74, 75, 74,
77,80, 81, 89, 86, 85, 83,72, 70, 71, 79, 76, 77,
80, 90, 97, 94, 90,65, .60, 67, 63 88, 84, 84, 87

???????

Type of feeding

Infants 600**600**

Breast 478

Bottle 65

Mixed 57

120 individuals were asked about their level of satisfaction toward the health care given by Hospital X. The response as follows
29 very satisfied, 39 satisfied, 20 neutral
18 unsatisfied, 14 highly unsatisfied

Thank you

Any questions?
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Presentation of Data

Descriptive Statistics
organizing and summarizing data and *bringing into a focus their essential characteristics*
Descriptive statis.
reduce the information to a manageable size

Data that collected from any source, are inadequate for planning .

Data need to be transformed into information
- by reducing them,
- by summarization and

- Arrange it in a simple and useful way
to
- bring out the *important point clearly & concise*

This mean that

display the important feature of the sample .

This is **Descriptive Statistics**

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