

Data

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Learning Objectives

- Introduction
- Types of data
- Scales of measurements

Introduction

Statistic

“Scientific treatment of data derived from individual”

Biostatistics or Biometry

“Statistics applied in the field of medicine, biology and public health.”

Variables

Variable and Attributes

Variable :

- Characteristic that can take on different values with respect to a person, time or place.

Attribute :

- Qualities that describes the objects.

Exercise

1. In a city there are 500 cases of malaria during last two months out of that one died due to complication.
2. Prevalence of smoking among adolescent boys in urban slum area of Surendranagar.

Types of variables in research

- Independent Variable
- Dependent Variable
- Confounding Variable

Types of variables in research

	Independent Variable	Dependent Variable
manipulated/measured	"manipulated" or "imposed" by researchers in an experiment	measured as outcome variable
groups different/groups the same	grouping variable: different levels for different groups in observational studies	all subjects in all groups are measured the same way
	each study may have several independent variables	each study likely has several to many dependent variables

Example:

- A balanced diet leads to more daily walking.
- More daily walking leads to increased happiness.

- Impact of smoking on long –term mortality in patients with acute MI.

3. Confounding or extraneous Variables :

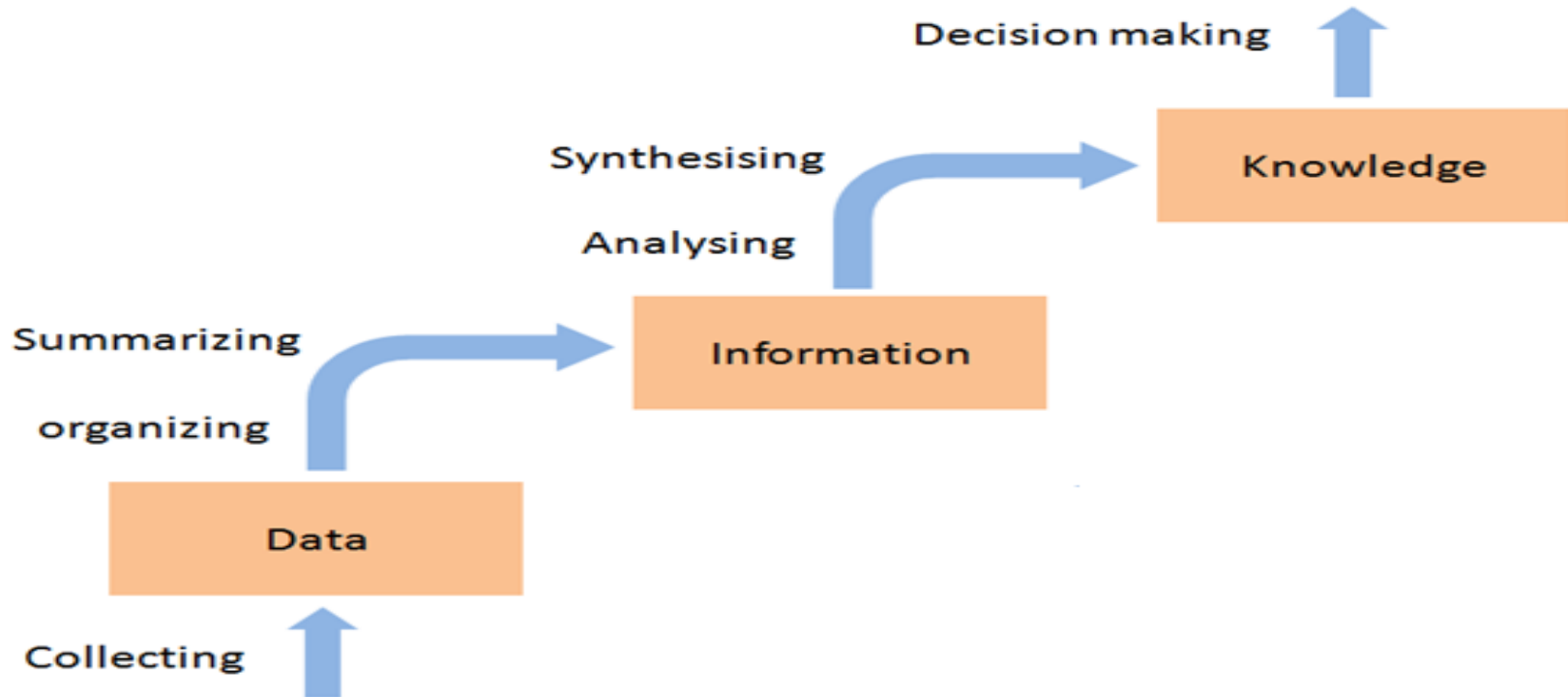
- Differences in the group other than the independent variable.

e.g- Effect of exercise on physical strength.
 Smoking and lung cancer

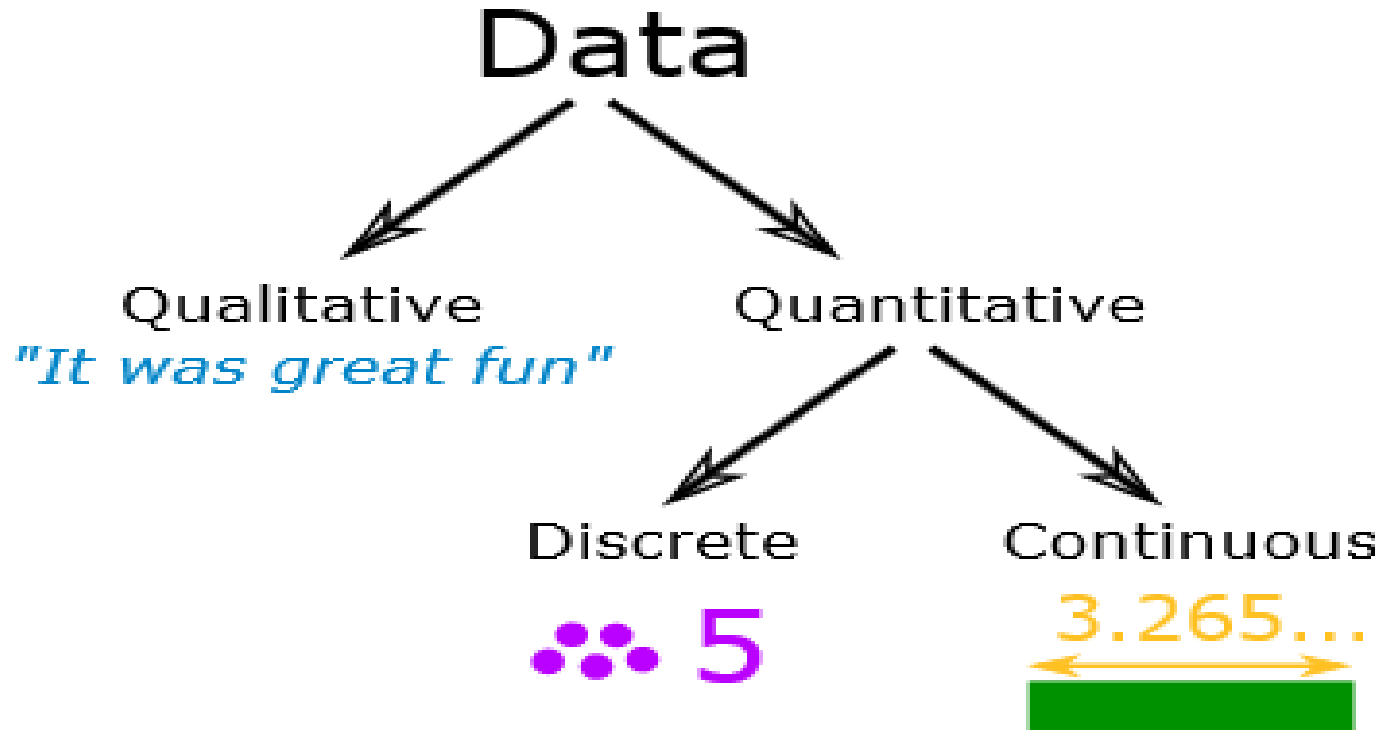
Data

Facts expressed in numerical terms

What is the need of data? ????



Classification of Data



Qualitative and Quantitative Data

Quantitative Data

are made with instruments such as rulers, balances, graduated cylinders, beakers, and thermometers.

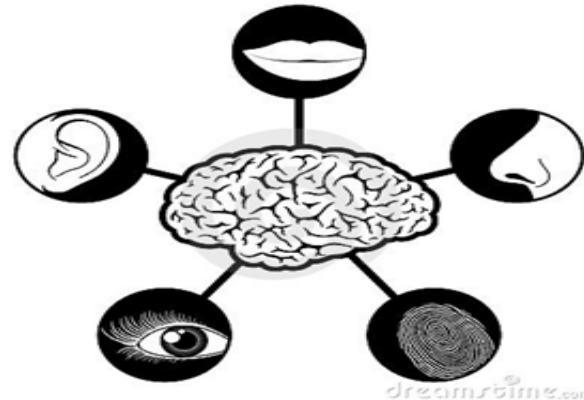
These results are measurable.

(numbers)

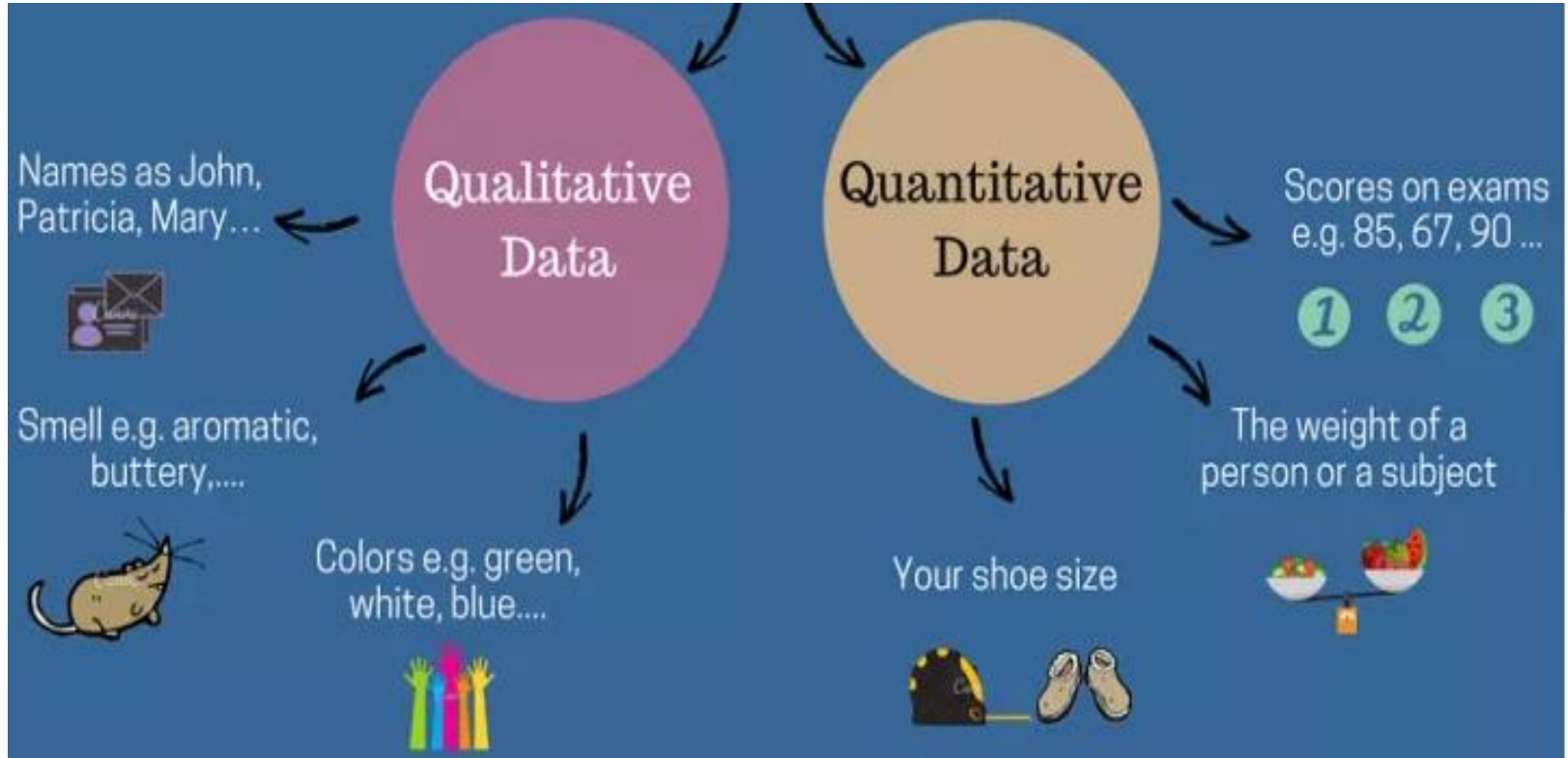


Qualitative Data

use your senses to observe the results.

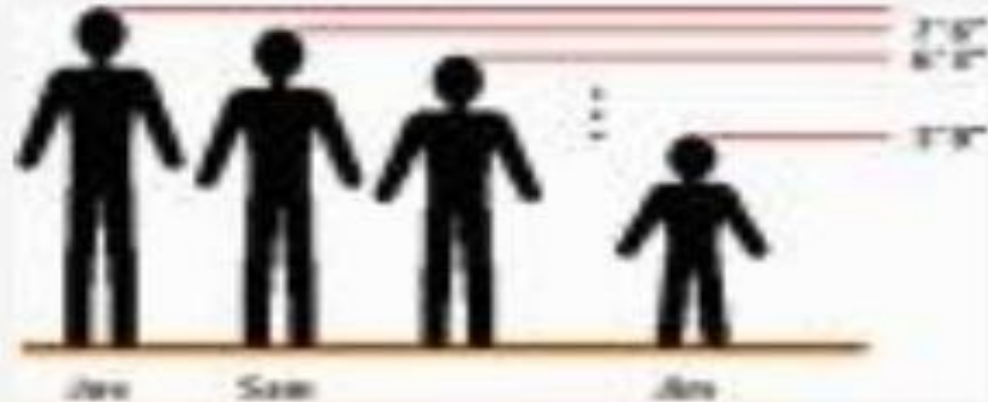


Example:



Transformation of Qualitative and Quantitative data

- Height



- Tall short medium small

Example

Quantitative Data	Qualitative Data
Height in Cm	Short/Medium/Tall
Weight in Kg	Under weight/ normal weight / obese
Haemoglobin in gm%	Anemic/ Non- anemic
Blood pressure in mmHg	Normotensive /hypertensive

Discrete and continuous data

Continuous

A set of data is said to be **continuous** if the values belonging to the set can take on **any** value within a finite or infinite interval.

Measured



$[0, 70]$

Discrete

A set of data is said to be **discrete** if the values belonging to the set are **distinct** and **separate**.

Counted

Example

- a. The number of suicides in the United States in a specific year.
- b. The concentration of lead in a sample of water. :
- c. The length of time that a cancer patient survives after diagnosis.
- d. The number of previous miscarriages an expectant mother has had.

Scales of Measurement

Measurement and scaling

Measurement:

- Assignment of numbers to events or objects according to a set of rules.

Scaling:

- Is process of placing the respondent on continuum with respect to their attitude toward services provided.
- E.g. 1 – very much unsatisfied 5- very much satisfied

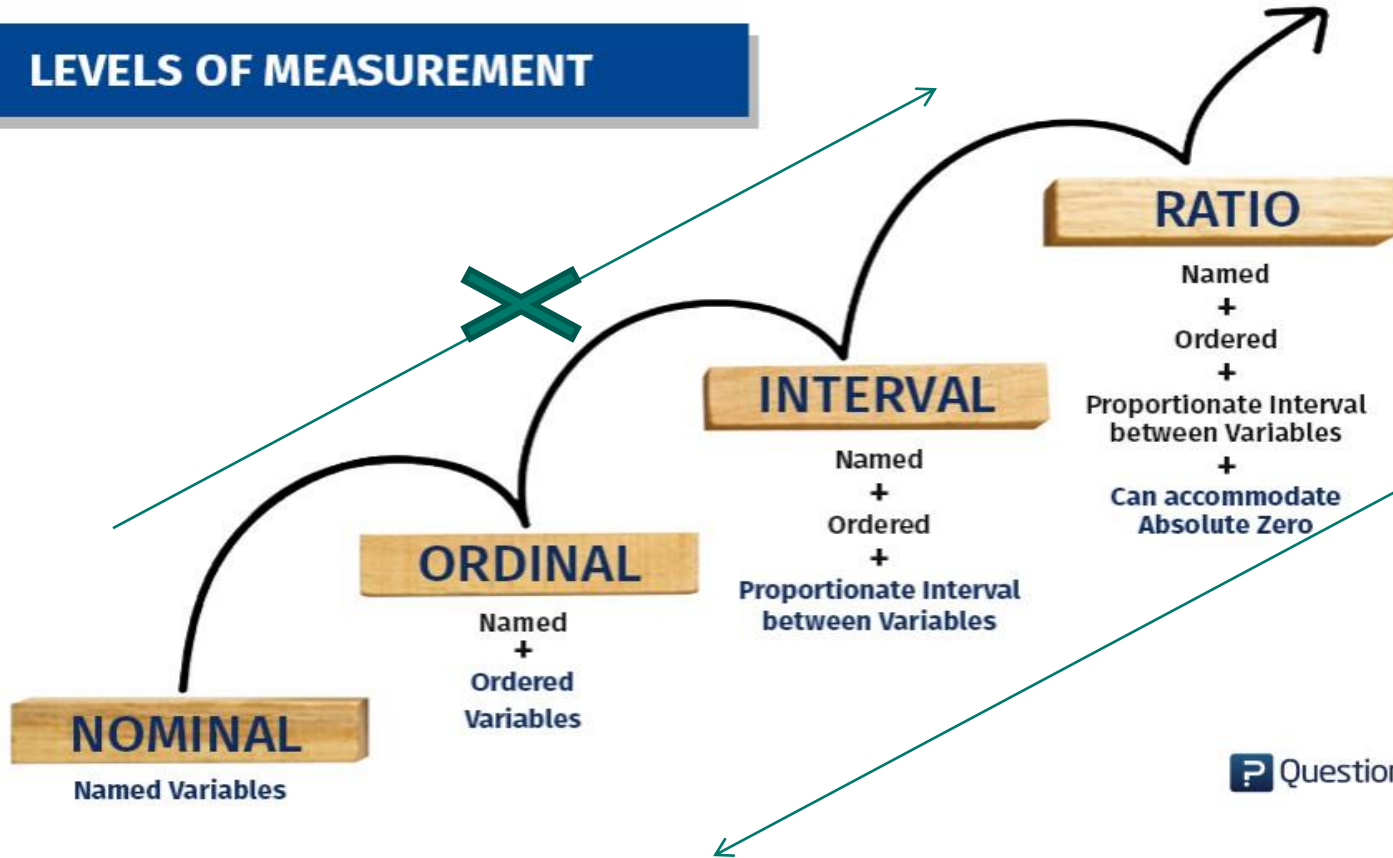
Scale characteristics

- Description -the unique labels or descriptors that are used to designate each value of scale
- Order - the relative size or positions of descriptors.
- Distance – absolute differences between the scale descriptors
- Origin - the scales has a unique or fixed beginning or true zero point.

Primary Scales of measurements

1. Nominal
2. Ordinal
3. Interval
4. Ratio

LEVELS OF MEASUREMENT



1. Nominal :

What are the different hair color?

2. Ordinal

Describe the diseases severity.

3. Interval :

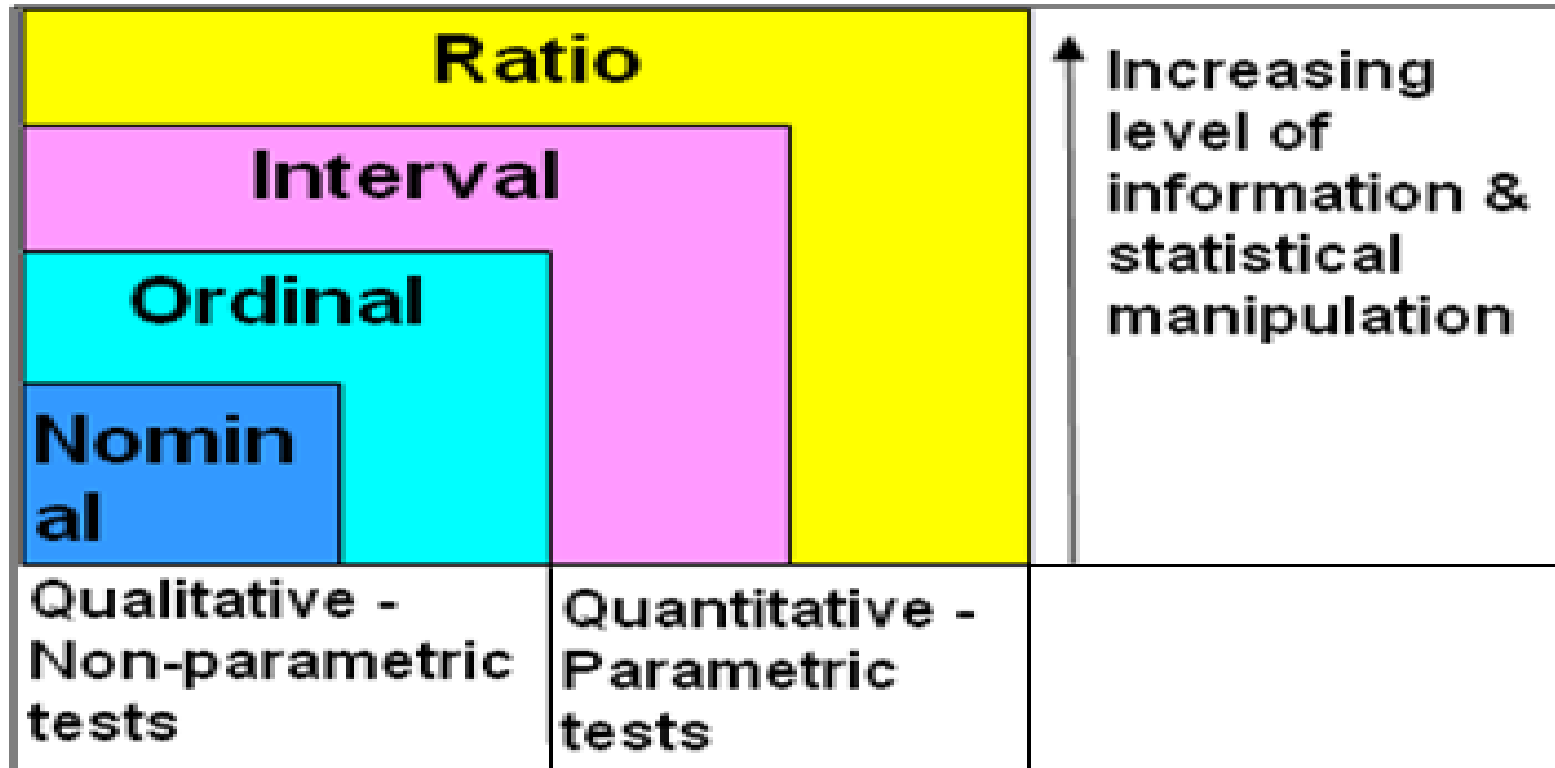
E.g. Temperature scale

CG: 0 10 30 100

FH: 32 50 86.....212

4. Ratio:

Most biomedical variables- weight in gm, time in seconds or day , BP, pulse rate



Categorize the given scale into nominal, ordinal, interval and ratio scale

1. Years of education = R
2. Hair color – Brown, Black, Blonde, Red, other = N
3. Likert scale – Strongly disagree, Disagree, Neutral, Agree, Strongly agree = O
4. Type of living accommodation – House, Apartment, Trailer, other = N
5. IQ (Intelligent Scale) = I
6. Income earned in a week = R
7. Time of day – Morning, Noon, Afternoon, Evening, Night = O

$(\text{THANK YOU})^n$

$n \in \mathbb{N}, n > 1$

$\text{YOU} \in \{\textit{Awesome People Set}\}$