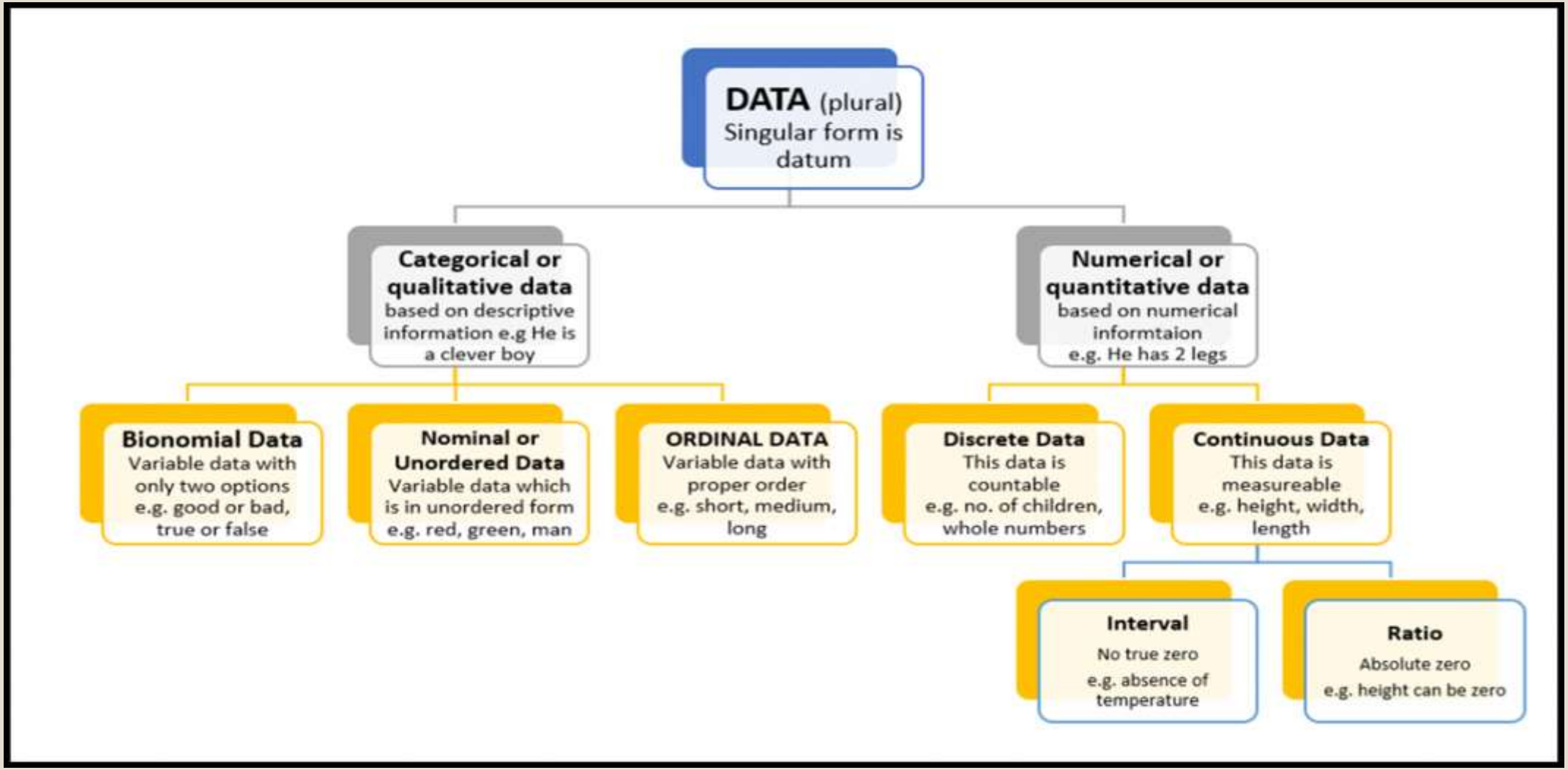
CONTENTS

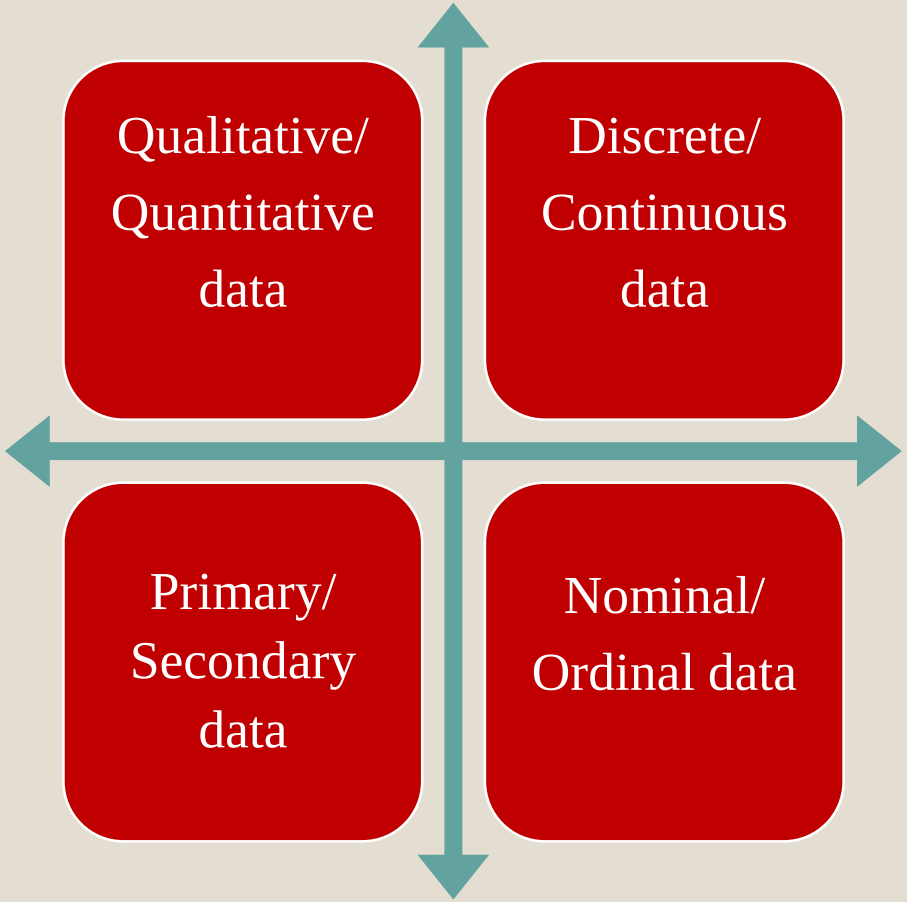
INTRODUCTION

- Data are individual units of information. A data describes a single quality or quantity of some object or phenomenon. In analytical processes, data are represented by variables.
- Data presentation is a method by which people organize, summarize and communicate information using a variety of tools such as text , tables , graphs and diagrams

CLASSIFICATION



TYPES OF DATA



Qualitative data:

Also called as enumeration data .Represents a particular quality or attribute. There is no notion of magnitude or size of the characteristic, as they can't be measured. Expressed as numbers without unit of measurements .

Eg: Religion, Sex, Blood group etc.

Quantitative data:

Also called as measurement data. These data have a magnitude. Can be expressed as number with or without unit of measurement.

Eg: Height in cm, Hb in gm%, BP inmm of Hg, Weight in kg.

DISCRETE DATA:

Here we always get a whole number.

Eg. Number of beds in hospital, Malaria cases

CONTINUOUS DATA :

It can take any value possible to measure or possibility of getting fractions.

Eg. Hb level, Ht, Wt.

PRIMARY DATA :

Obtained directly from an individual , it gives precise information .

SECONDARY DATA :

Obtained from outside source

Eg: Data obtained from hospital records, Census

NOMINAL DATA:

The information or data fits into one of the categories, but the categories cannot be ordered one above another .

E.g.. Colour of eyes, Race, Sex

ORDINAL DATA:

here the categories can be ordered, but the space or class interval between two categories may not be the same.

E.g.. We could have categories for prognosis such as good, fair, poor, hopeless, or stages of periodontitis as mild, moderate, or severe

UNPAIRED (INDEPENDENT OR UNMATCHED) DATA

Where data are obtained from two groups that are unrelated to each other. Measurements are taken on two separate groups of individuals.

E.g. males vs. females, age groups, and parallel designs.

PAIRED OR MATCHED DATA

where the measurements are taken on the same individual or matched groups as in a split mouth or same group before and after or cross over designs.

Principals of data presentation

To arrange the data in such a way that it should create interest in the reader's mind at the first sight.

To present the information in a compact and concise form without losing important details.

To present the data in a simple form so as to draw the conclusion directly by viewing at the data

To present it in such away that it can help in further statistical analysis.

USES OF DATA PRESENTATION METHODS

- Easy and better understanding of the subject
- Provides first hand information about data
- Helpful in future analysis
- Easy for making comparisons

CRITERIA FOR SELECTING A DATA PRESENTAION METHOD

- Size of study
- Scope of study
- Program participation
- Worker cooperation
- Intrusion into the lives of research participants
- Resources
- Time
- Previous research findings

SIZE – the number of people , places or systems represented in a research study . Greater the number , the more complex the data collection process

SCOPE – the scope of our research study refers to depth of the problem being investigated to select the proper data methods

PROGRAM PARTICIPATION – research studies that take place in agency settings should have the support from program personnel

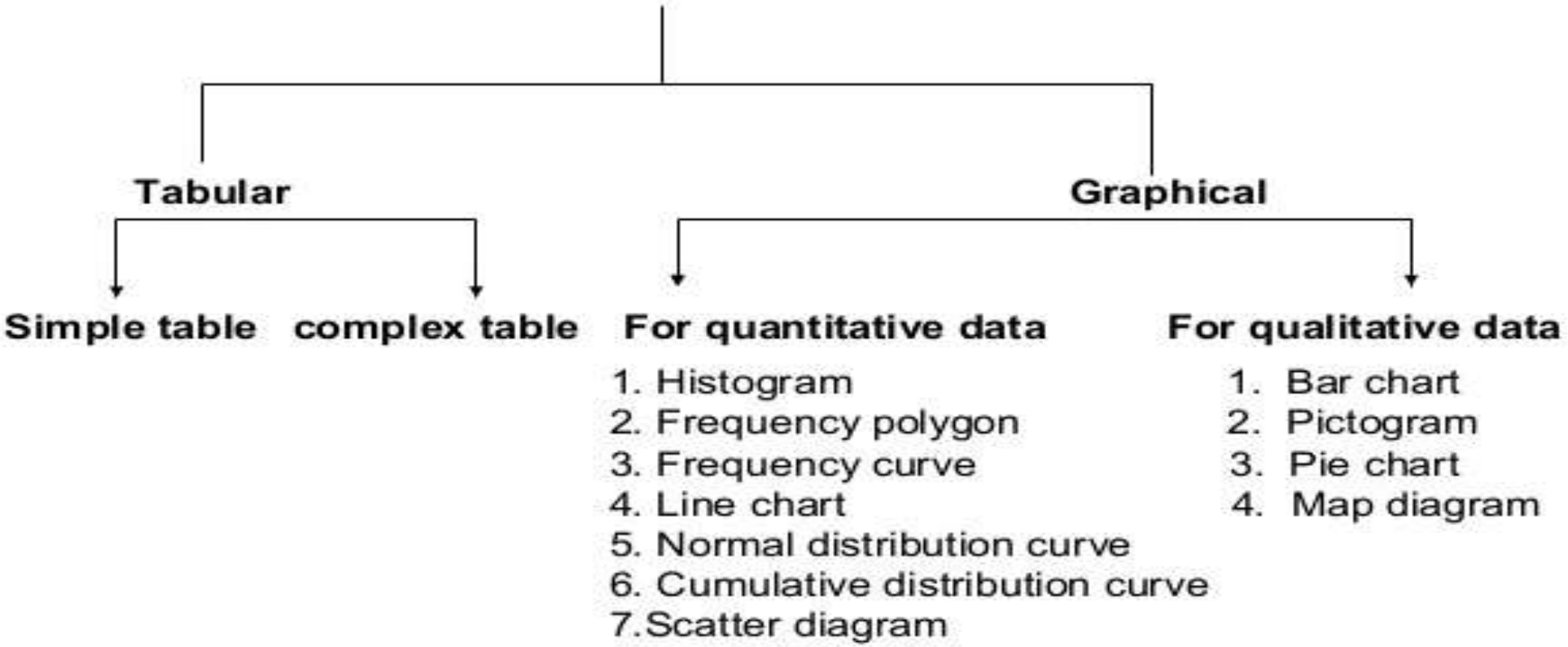
WORKER COOPERATION – every effort is made to work co operatively with the programs workers and establish a way for workers to get feedback from the data they provide

INTRUSION INTO THE LIVES OF RESEARCH PARTICIPANTS – A client will not be denied service for refusing to participate in a research study

TIME – research projects often have fixed completion dates . Time constraints will influence the choice of data collection methods

PREVIOUS RESEACH STUDIES – learn from existing research studies like which data collection methods worked best to study the problem . Expand upon earlier research by trying different data collection approaches

Presentation of data



TEXT PRESENTATION

- Is the main method of conveying information as it is used to explain results and trends, and provide contextual information.
- Data are fundamentally presented in paragraphs or sentences.
- Text can be used to provide interpretation or emphasize certain data.
- If quantitative information to be conveyed consists of one or two numbers, it is more appropriate to use written language than tables or graphs

TABULAR PRESENTATION

Is a systematic and logical arrangement of classified data in rows and columns

Most appropriate for presenting individual information, and can present both quantitative and qualitative information

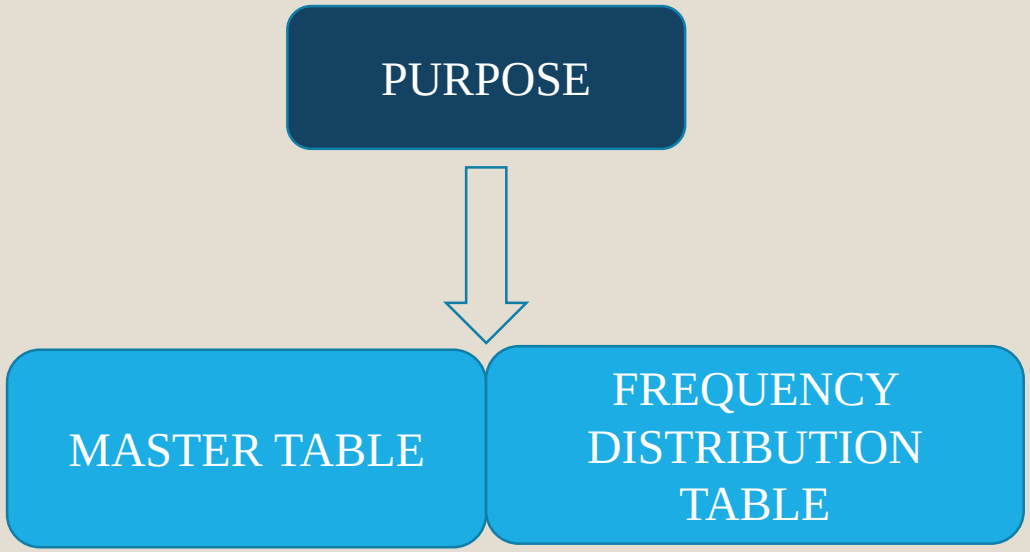
The strength of tables is that they can accurately present information that cannot be presented with a graph

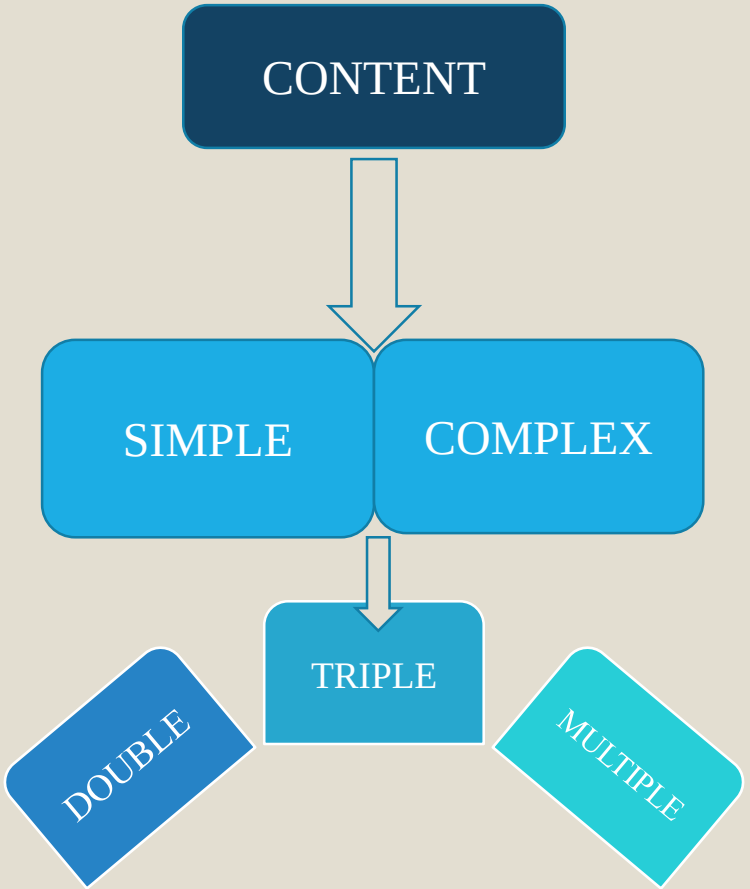
useful for summarizing and comparing quantitative information of different variables.

BASIC RULES FOR THE PREPARATION OF TABLES

1. Be self-explanatory
2. Present values with the same number of decimal places in all its cells
3. Include a title informing what is being described and where, as well as the number of observations and when data were collected
4. Have a structure formed by three horizontal lines, defining table heading and the end of the table at its lower border
5. Provide additional information in table footer, when needed
6. Be inserted into a document only after being mentioned in the text

TYPES OF TABLE





MASTER TABLE

Tables which contain all data obtained from a survey.

FREQUENCY DISTRIBUTION TABLE

The data is first split up into convenient groups (class interval) and the number of items (frequency) which occur in each group is shown in adjacent columns.

Hence it is a table showing the frequency with which the values are distributed in different groups or classes with some defined characteristics.

Scores	Frequency
0 - 2	1
3 - 5	2
6 - 8	13
9 - 11	15
12 - 14	19

SIMPLE TABLE

Gender	No of students
Boys	9
Girls	29

Data relating to only one characteristics

DOUBLE TABLE

Gender	Food habit	
	Vegetarians	Non Vegetarians
Boys	2	7
Girls	5	24

Data relating to only two characteristics

TRIPLE DATA

Gender	Food habit			
	Vegetarians		Non Vegetarians	
	Age below 20 years	Age 20 & above years	Age below 20 years	Age 20 & above years
Boys	0	2	1	6
Girls	1	4	10	14

Data relating to three characteristics

MULTIPLE DATA

Gender		Food habit			
		Vegetarians		Non Vegetarians	
		Age <20 years	Age >=20 years	Age < 20 years	Age>= 20 years
Boys	Day scholars	0	0	1	4
	Hostellers	0	2	0	2
Girls	Day scholars	0	1	2	2
	Hostellers	1	3	8	12

Data related to multiple characters is presented

REFERENCE TABLE

- These tables present the original data for reference purposes
- It contains only absolute and actual figures and round numbers or percentages

Sl.No	Contents	Page numbers

TEXT TABLES

- Constructed to present selected data from one or more general purpose tables
- It brings out a specific point of answer to specific questions
- It includes ratios , percentages , averages etc
- It should be found in the body of the text

MATERIAL	SPECIFIC HEAT (Joules/gram • °C)
Liquid water	4.18
Solid water (ice)	2.11
Water vapor	2.00
Dry air	1.01
Basalt	0.84
Granite	0.79
Iron	0.45
Copper	0.38
Lead	0.13

HEAT MAPS

Helps to further visualize the information presented in a table by applying colors to the background of cells.

By adjusting the colors or color saturation, information is conveyed in a more visible manner and readers can quickly identify the information of interest

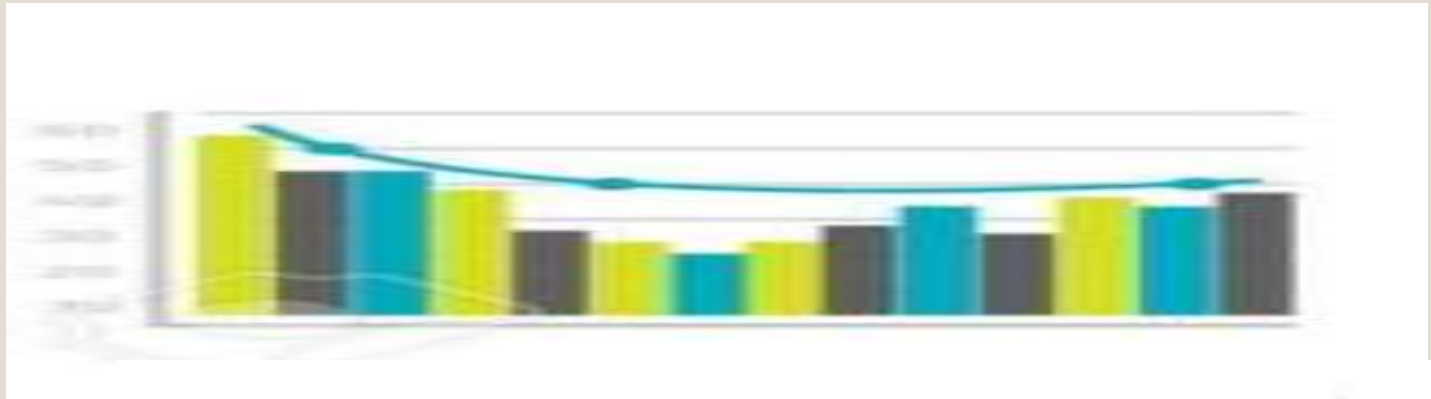
Example of a regular table				Example of a heat map			
SBP	DBP	MBP	HR	SBP	DBP	MBP	HR
128	66	87	87	128	66	87	87
125	43	70	85	125	43	70	85
114	52	68	103	114	52	68	103
111	44	66	79	111	44	66	79
139	61	81	90	139	61	81	90
103	44	61	96	103	44	61	96
94	47	61	83	94	47	61	83

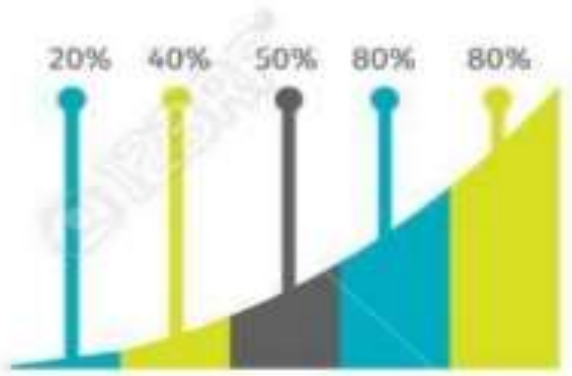
SIGNIFICANCE

- Simplifies complex data
- Unnecessary details and repetitions of data can be avoided in tabulation
- Facilitates comparison
- Gives identity to data
- Reveals pattern with in the figures which cannot be seen in the narrative form

ADVANTAGES	DISADVANTAGES
more information may be presented	Interpretation of information takes longer in in graphs.
exact values can be read from a table to retain precision	Since all data are of equal importance in a not easy to identify and selectively choose the information required.
Less work and less cost are required in the	
flexibility is maintained without distortion of	

GRAPHS





GRAPH PRESENTATION

simplify complex information by using images and emphasizing data patterns or trends

useful for summarizing, explaining, or exploring quantitative data.

effective for presenting large amounts of data, and they can be used in place of tables to present small sets of data

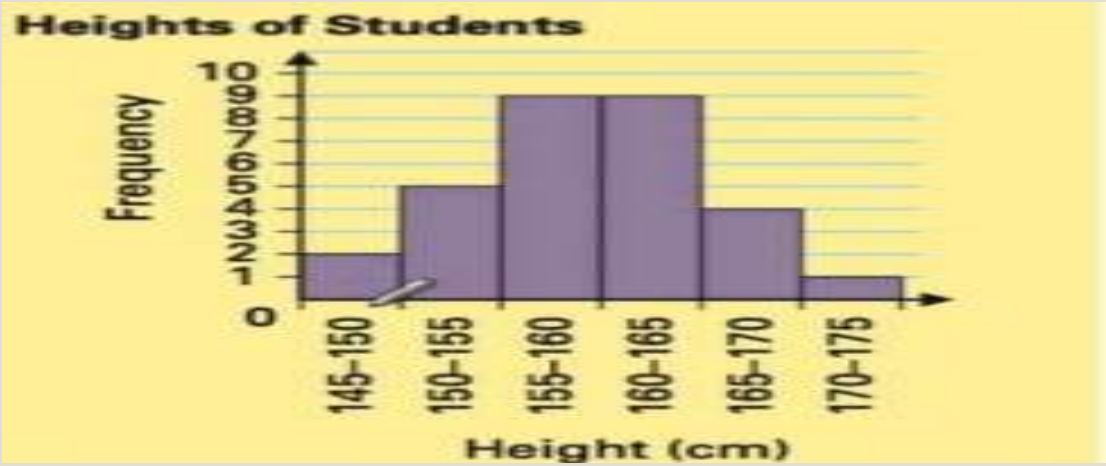
A graph format that best presents information must be chosen so that readers and reviewers can easily understand the information

BASIC RULES FOR THE PREPARATION OF GRAPHS

1. Be self-explanatory
2. Be referred to as figures in the text
3. Identify figure axes by the variables under analysis
4. Include, below the figure, a title providing all relevant information
5. Quote the source which provided the data, if required
6. Demonstrate the scale being used

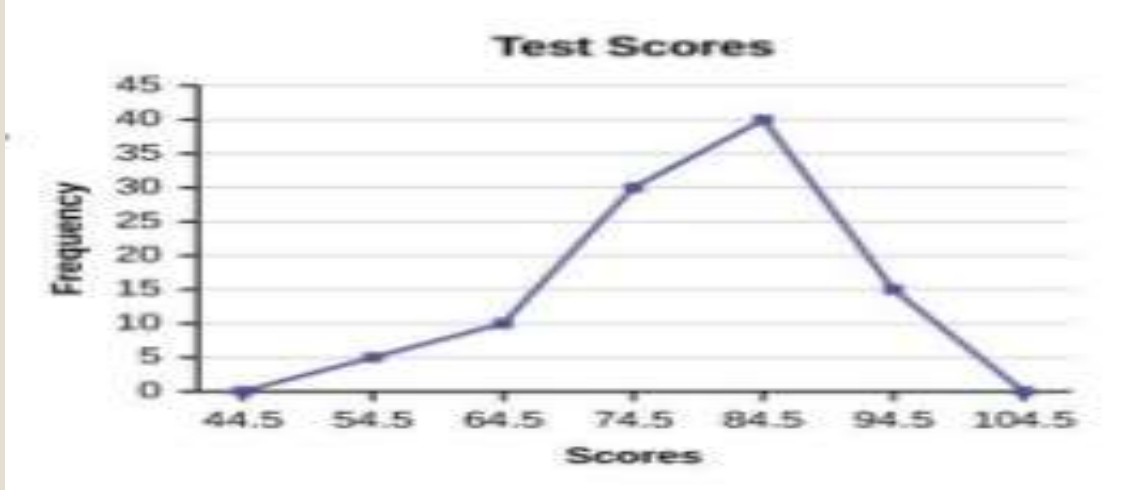
HISTOGRAM

- Represented by a set of rectangular bars
- Variables is taken along the X axis and frequency along the y axis
- With the class intervals as base , rectangles with height proportional to class frequency are drawn
- The set of rectangular bars so obtained gives histogram
- The total area of the rectangles in a histogram represents total frequency



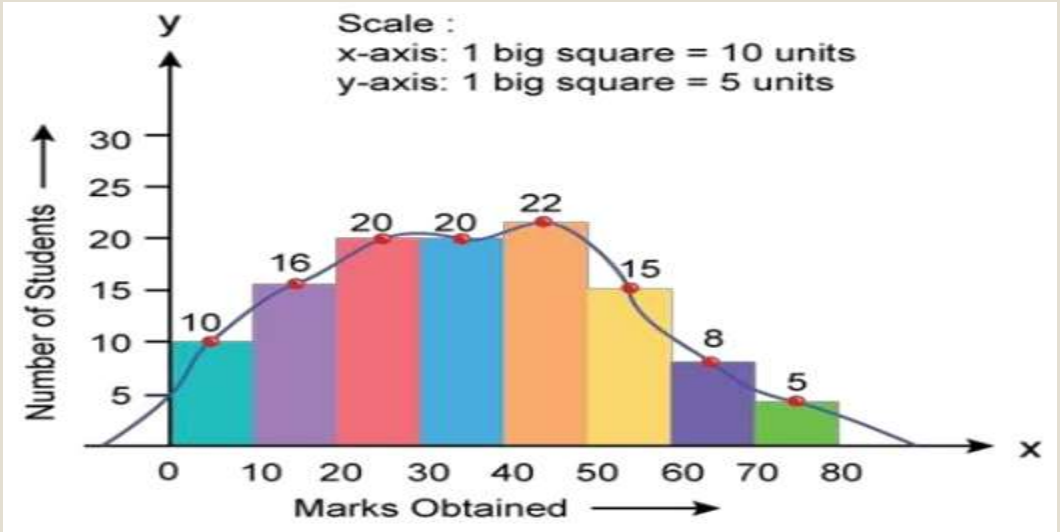
FREQUENCY POLYGON

- Variables is taken along the X axis and frequencies along the y axis
- Class frequencies are plotted against the class mid-values and then these points are joined by a straight line which gives a figure of frequency polygon
- Total area under the frequency curve represents the total frequency



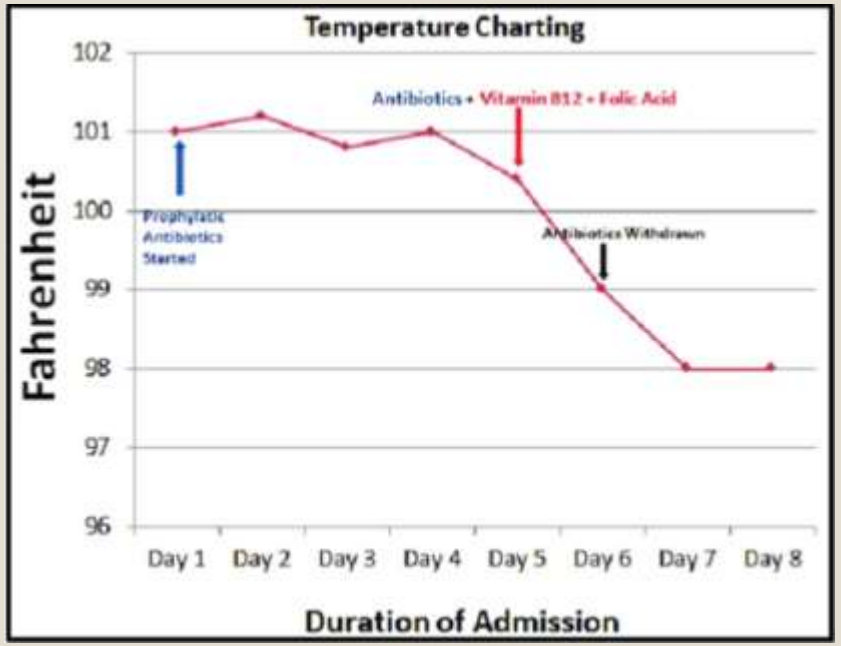
FREQUENCY CURVE

- Variables is taken along the X axis and frequency along Y axis
- Frequencies are plotted against the class mid-values and then , these points are joined by a smooth curve
- The curve so obtained is the frequency curve
- Total area under the frequency curve represents total frequency



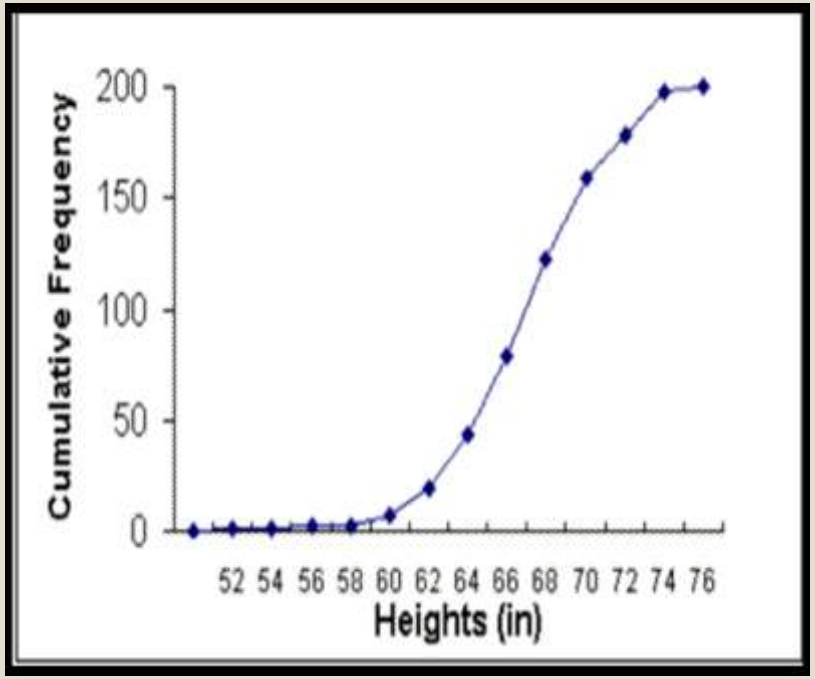
LINE GRAPH (TIME SERIES GRAPH)

- Line graphs are used to display the comparison between two variables which are plotted on the x axis and y axis
- The x axis represents measures of time , while the y axis represents percentage or measures of quantity
- They organize and present data in a clear manner and show relationships between the data
- Line graphs displays a change in direction
- It shows trend of an event occurring over a period of time to know whether it is increased or decreased eg cancer deaths etc



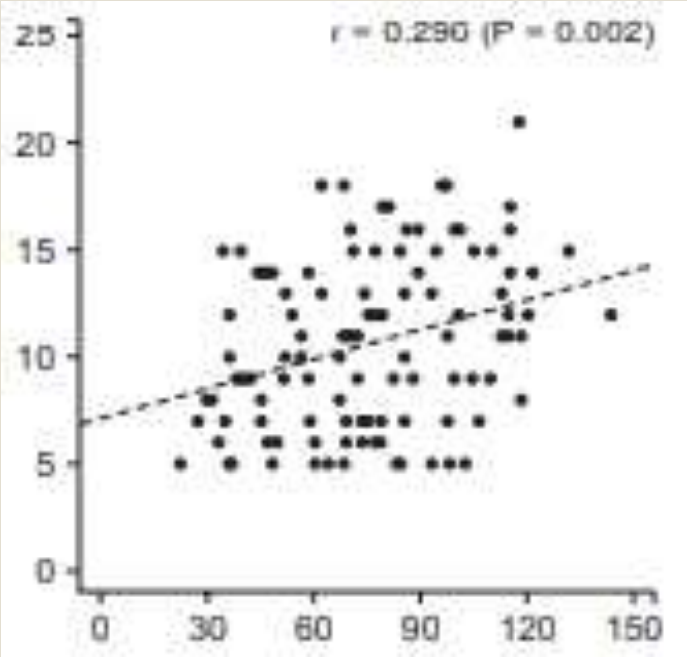
CUMULATIVE FREQUENCY POLYGON

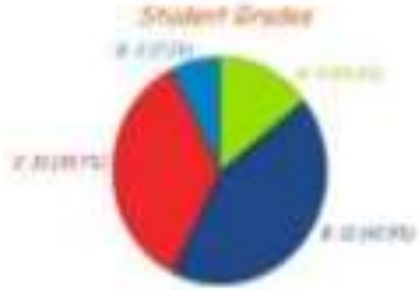
- It is a line graph (rather than a bar graph)
- Uses class boundaries on x-axis
- Uses cumulative frequencies rather than individual class frequencies
- Used to visually represent how many values are below a specified upper class boundary

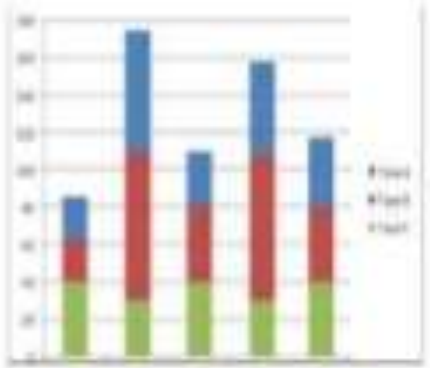


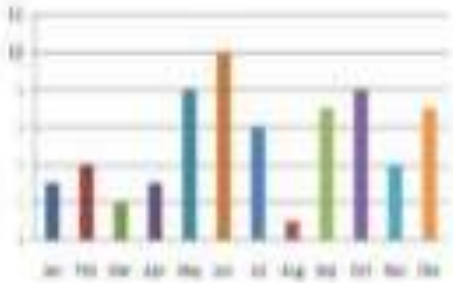
SCATTER DIAGRAM

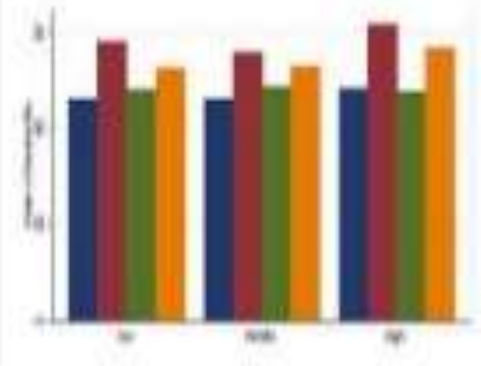
- Scatter plots present data on the x- and y-axis and are used to investigate an association between two variables.
- A point represents each individual or object, and an association between two variables can be studied by analyzing patterns across multiple points.
- A regression line is added to a graph to determine whether the association between two variables can be explained or not

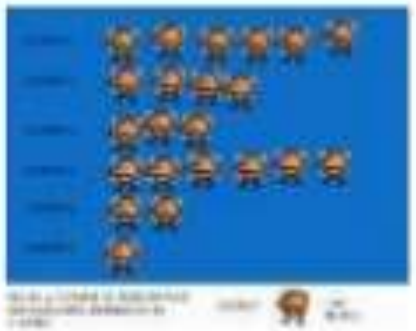


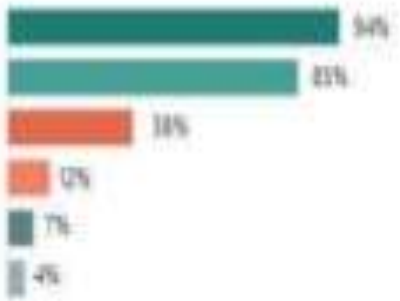












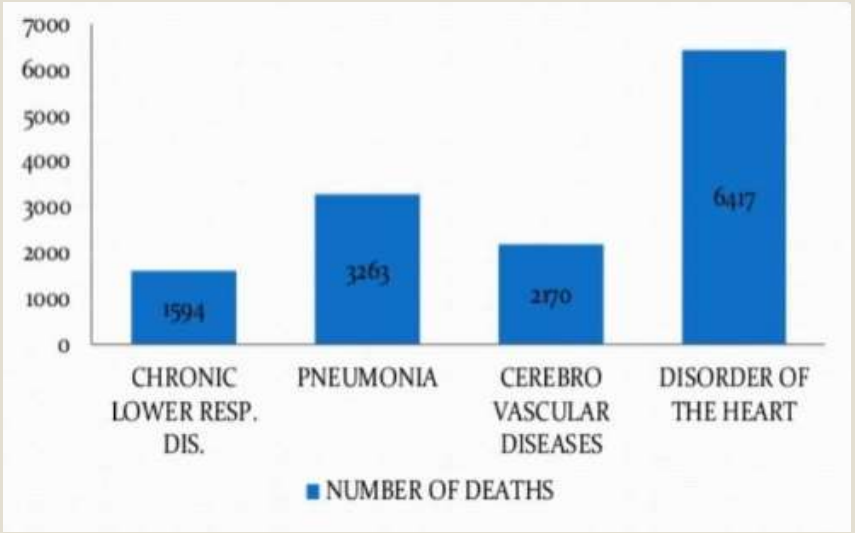
DIAGRAMS

BAR DIAGRAM /BAR CHART

- Bar diagram consists of a series of rectangular bars of equal width
- The bars stand on common baseline with equal gap between one bar and another
- The bars may be either horizontal or vertical
- The bars are constructed in such a way that their lengths are proportional to the magnitudes (frequency)

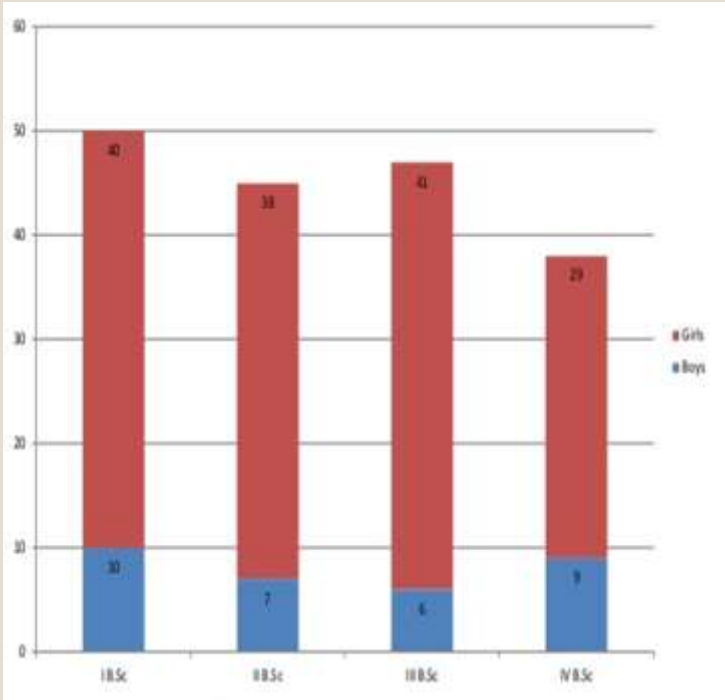
SIMPLE BAR DIAGRAM

- Used to represent when items have to be compared with regard to a single characteristic
- Here the items are represented by rectangular bars of equal width and height proportional to their magnitude
- The bars are drawn on a common base line , with equal distance between consecutive bars and may be shaded



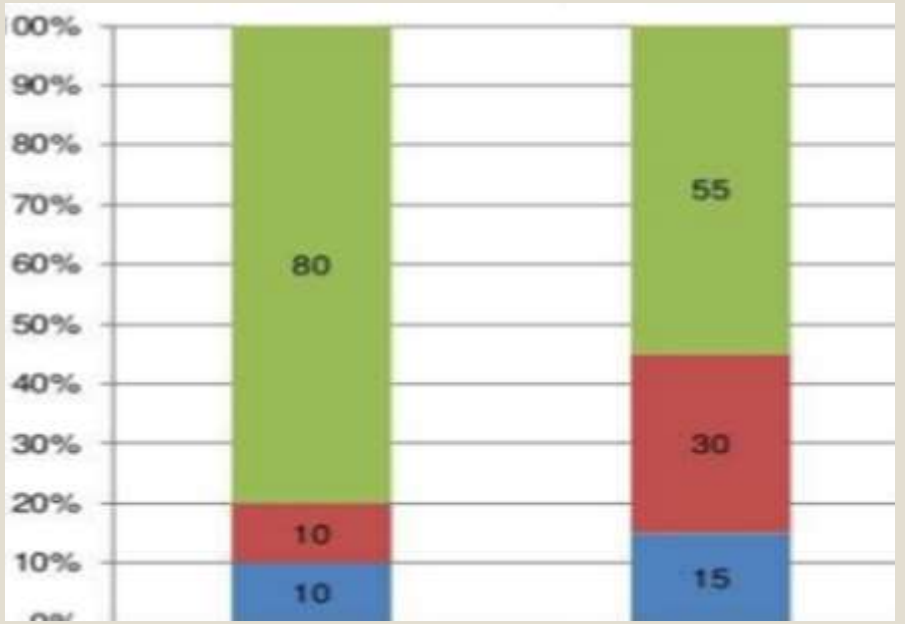
SUBDIVIDED BAR DIAGRAM

- Also called as component , stacked or proportional bar diagram
- The data have items whose magnitudes have two or more components
- In this the items are represented by rectangular bars of equal width and height proportional to magnitude
- Then the bars are divided so that the sub divisions in height represent the components
- To distinguish the components from one another clearly , different shades are applied and an index describing the shades is provided
- Component bars are drawn when a comparison of total magnitudes along with the components is required



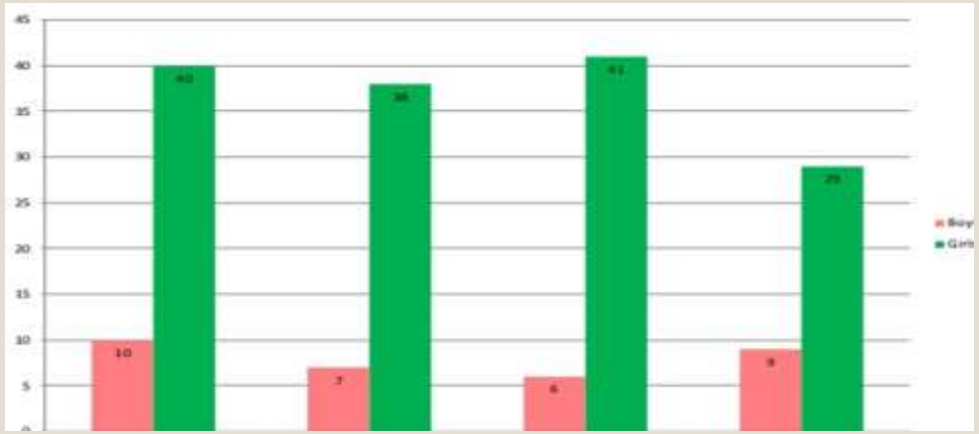
PERCENTAGE BAR DIAGRAM

- To represent items whose magnitudes have two or more components. The comparison of components are expressed as percentages of the corresponding totals
- The totals are represented by bars of equal width and height equal to 100 each
- These bars are divided according to the percentage components. The different sub divisions are shaded properly and an index which describes the shades is provided
- Percentage bars are useful in comparing percentage components



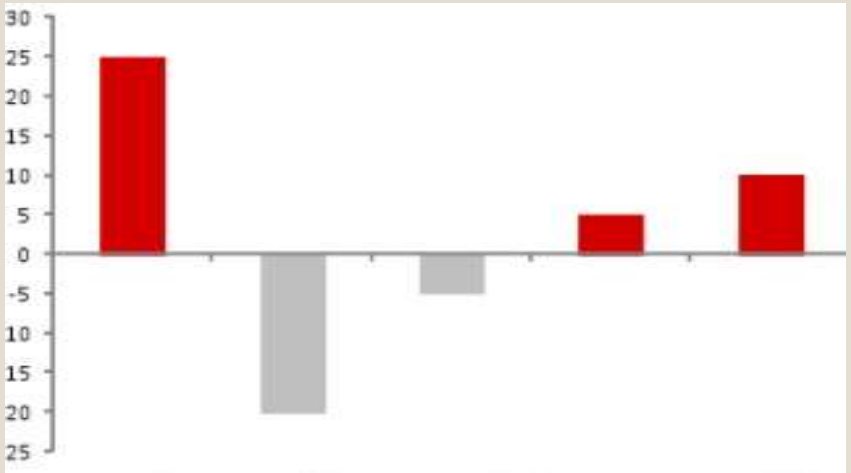
MULTIPLE BAR DIAGRAM

- When there are two or more different comparable sets of values , multiple bars are drawn
- Here sets of rectangular bars of equal width with height proportional to the value are drawn
- The bars corresponding to the same unit are placed together adjacent to one another
- The diagram is shaded properly and an index is provided



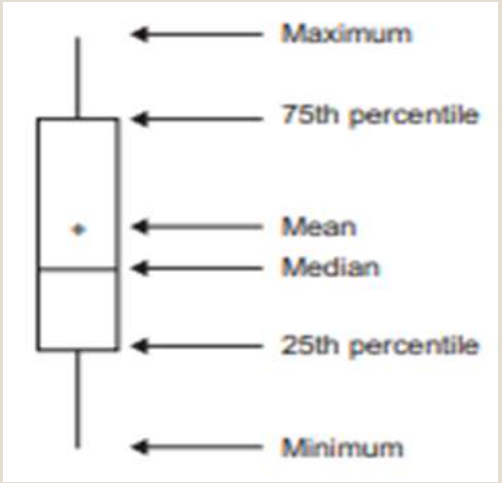
DEVIATION BAR DIAGRAM

- Useful for presenting net quantities which have both positive and negative values
- The positive deviatons are presented by bars above the baseline while negative deviations are presented by bars below the baseline



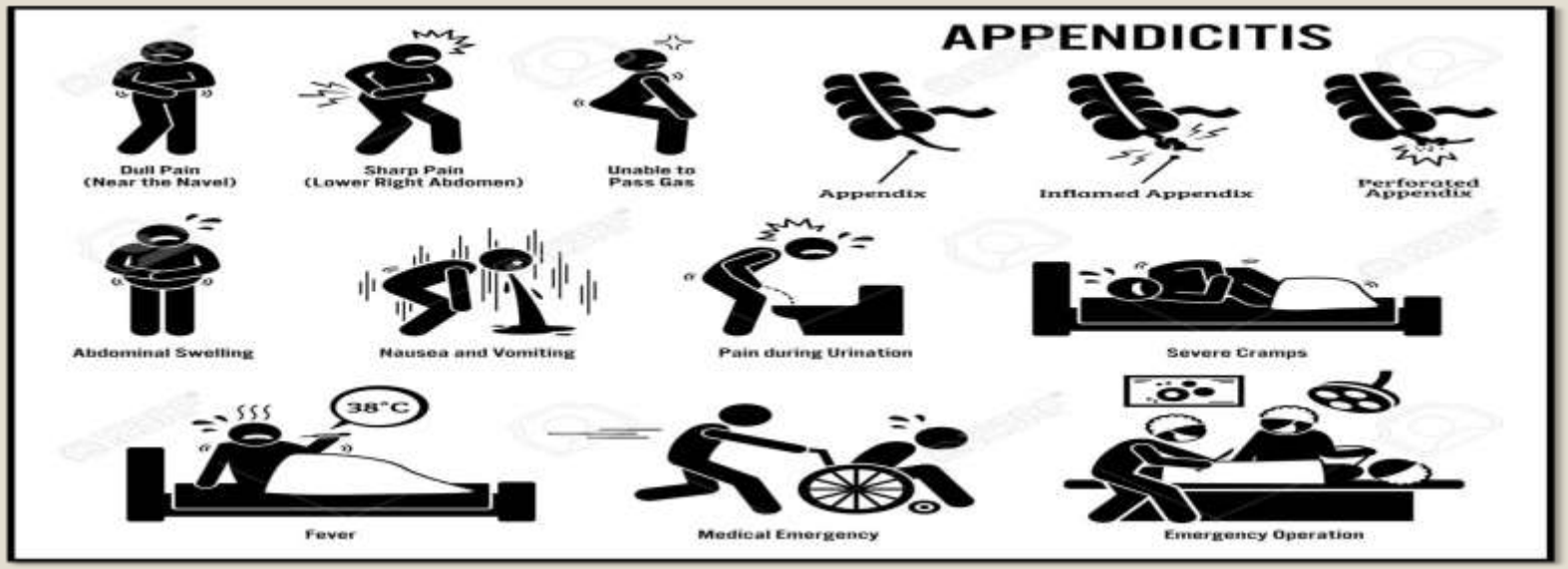
BOX AND WHISKER CHART

- Represents variations in samples of a population; therefore, it is appropriate for representing nonparametric data.
- A box and whisker chart consists of boxes that represent interquartile range, the median , mean of the data, and whiskers presented as lines outside of the boxes.
- Whiskers can be used to present the largest and smallest values in a set of data or only a part of the data
- The spacing at both ends of the box indicates dispersion in the data.
- The relative location of the median demonstrated within the box indicates skewness



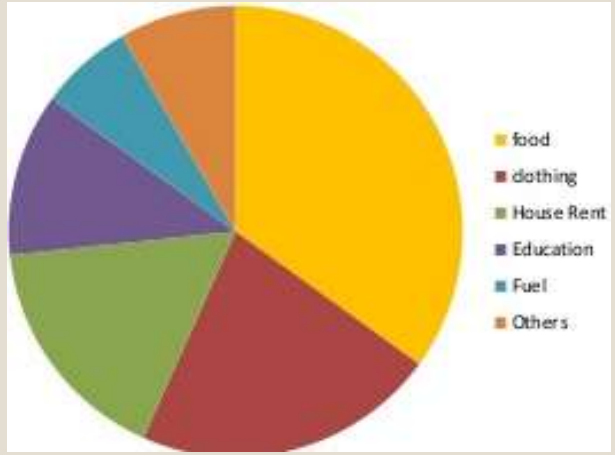
PICTOGRAM

- Popular method of presenting data to those who cannot understand orthodox charts.
- Small pictures or symbols are used to present the data
- Fraction of the picture can be used to represent numbers smaller than the value of whole symbol



PIE DIAGRAM

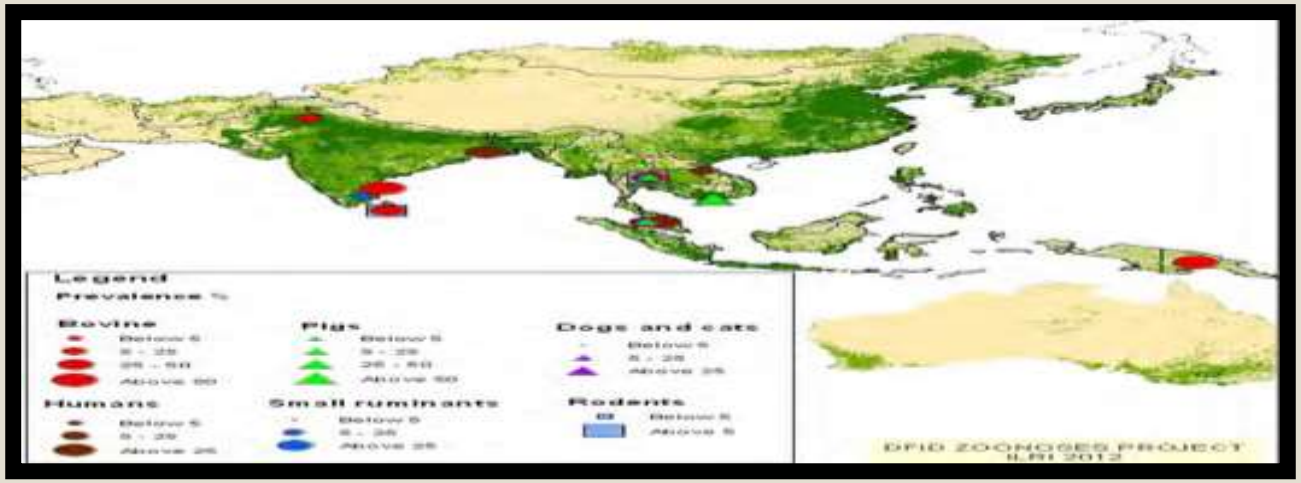
- Presenting discrete data of qualitative characteristics such as blood groups, RH factor, age group , sex group , cause of mortality or social group in a population etc
- The frequencies of the groups are shown in a circle
- Degrees of angle denote the frequency and area of the sector
- Size of each angle is calculated by multiplying the frequency/total frequency by 360
- It is also used for data that have no other way of being represented aside from a table



STATISTICAL MAP

- Statistical data refers to geographic or administrative areas, it is presented either as statistical map or dot map.

- The shaded maps are used to present data of varying size. The areas are shaded with different colour or different intensities of the same colour, which is indicated in the key.



Types of Charts Depending on the Method of Analysis of the Data

Analysis	Subgroup	Number of variables	Type
Comparison	Among items	Two per items	Variable width column chart
		One per item	Bar/column chart
	Over time	Many periods	Circular area/line chart
		Few periods	Column/line chart
Relationship		Two	Scatter chart
		Three	Bubble chart
Distribution		Single	Column/line histogram
		Two	Scatter chart
		Three	Three-dimensional area chart
Comparison	Changing over time	Only relative differences matter	Stacked 100% column chart
		Relative and absolute differences matter	Stacked column chart
	Static	Simple share of total	Pie chart
		Accumulation	Waterfall chart
		Components of components	Stacked 100% column chart with subcomponents

CONCLUSION

Understanding how to classify the different types of variables and how to present them in tables or graphs is an essential stage for epidemiological research in all areas of knowledge . Mastering this topic collaborates to synthesize research results and prevents the misuse or overuse of tables and figures in scientific papers.