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HEALTH STATISTICS

HEALTH STATISTICS

- Definition
- Sources
- Uses
- Data collection
- Classification
- Presentation
- Vital statistics – Morbidity, Mortality and Fertility rates
- Health survey

: Definition :

1. Statistics is systematic collection of numerical information. It is the science of collecting, classifying, presenting and interpreting data relating to any sphere of enquiry.
2. Statistics is a piece of data obtained from study of large number of numerical data.
3. Health statistics are numbers about some aspects of health like, statistics about vital events, health care costs, demographic distribution of disease based on geographic, ethnic and gender variables and data on socioeconomic status and education of health care professionals.

: Sources :

1. Census
2. Registration of Vital events
3. Sample Registration System
4. Notification of diseases
5. Hospital records
6. Disease registers
7. Record linkage
8. Epidemiological surveillance
9. Other health service records
10. Environmental health data
11. Health manpower statistics
12. Population surveys
13. Other routine statistics related to health
14. Non – quantifiable information

: Uses :

- To measure the health status of the people and to quantify their health problems and medical and health care needs.
- For local, national and international comparisons of health status.
- For planning, administration and effective management of health services and programmes.
- For assessing whether health services are accomplishing their objectives in terms of their effectiveness and efficiency.
- For assessing the attitudes and degree of satisfaction of the beneficiaries with the health system.
- For research into particular problems of health and disease.

: Data Collection :

- **Data** : Data are individual pieces of factual information recorded and used for the purpose of analysis.
- Data consists of discrete observations of attributes or events.
- The data for any study can be collected directly from the source of information by investigator himself or collected by some one else for yet another study.
- Data collected should be accurate, valid, precise and reliable.

- While deciding about the method of data collection to be used for the study, the recording should keep in mind 2 types of data – Primary and Secondary.
- **Primary Data** : are those which are collected afresh and for the first time and thus happen to be original in character.
- **Secondary Data** : are those which have already been collected by someone else and which have already been passed through the statistical process.

Collection of primary data

- There are several methods of collecting primary data, particularly in surveys and descriptive researches. Important ones are ;

1. Observation method
2. Interview method – Personal/Telephonic
3. Through questionnaires
4. Through schedules
5. Other methods – Warranty cards, Distributor audits, Pantry audits, Consumer panels, Using mechanical devices, Through projective techniques, Depth interviews and Content analysis.

1. Observation Method

- Most commonly used in studies relating to behavioral sciences.
- Observation becomes a scientific tool when it is systematically planned and recorded and is subjected to checks and controls on validity and reliability.

2. Interview Method

- Involves presentation of oral – verbal stimuli and reply in terms of oral – verbal responses.

a) **Personal Interviews** : requires an interviewer who asks questions in a face – to – face contact to other person / persons.

❖ Merits :

1. More and deep information can be obtained.
2. Depends on the interviewer skills.
3. Flexibility.
4. Personal information will be obtained easily.
5. Controlled very effectively – group discussion.
6. Misinterpretations concerning questions can be avoided by using local language.
7. Interviewer can collect supplementary information about respondents.

❖ Demerits :

1. Expensive when large and widely spread geographical sample is taken.
2. Possibilities of bias of both interviewer and respondent.
3. Data may prove inadequate if there is lack of presence of high income groups.
4. More time consuming.
5. Presence of interviewer on the spot may over stimulate the respondent.
6. Organization required for selecting, training and supervising the field staff is more complex.

b) Telephone interview : collecting information consists in contacting respondents on telephone itself. Not widely used but plays important part in industrial surveys.

❖ Merits :

1. More flexible when compared to mailing method.
2. Faster, quick way to obtain information.
3. Cheaper than personal interview.
4. Recall is easy, simple and economical.
5. Higher rate of response.
6. Replies can be recorded.
7. No field staff is required.
8. Interviewer can explain requirements more easily.

❖ Demerits :

1. Little time is given to respondents for considered answers, maximum 5 minutes in most cases.
2. Restricted to respondents who are having telephone facilities.
3. It is not suitable for intensive surveys where comprehensive answers are required to various questions.
4. Possibility of the bias of the interviewer is relatively more.
5. Question have to be short and to the point.

3. Through Questionnaires :

- Quite popular in case of big enquiries.
- Adopted by private individuals, research workers, private and public organizations and even by governments.
- Here, questionnaire is sent by post/mail to the persons concerned with a request to answer the questions and return the same.
- Questionnaire consists related questions and space for the answers. Respondent have to read, understand and write the answers in given space.
- Merits : low cost, free from bias of interviewer, adequate time will be there to answer, useful for the respondents who are not easily approachable.

4. Through Schedules :

- Same as like collection of data through questionnaire.
- But the difference lies in the fact that schedules (proforma containing set of questions) are being filled in the enumerators who are specially appointed for the purpose.

5. Through other methods :

a) **Warranty cards** : Postal sized cards used by dealers of consumer durables to collect information regarding their products. Warranty card contain printed questions which is placed inside the package with product with a request to consumer to fill the card and post it back to dealer.

b) **Distributor or store audits** : Observational method performed by distributors / manufactures through their salesmen at regular intervals. Retail stores audited and they use such information to estimate market size, share, seasonal purchasing pattern etc.

c) Pantry audits : this technique is used to estimate consumption of the basket of goods at the consumer level. Investigator collects an inventory of types, quantities and prices of commodities consumed. Thus data are recorded from the examination of consumer's pantry. Gives importance for consumers preferences.

d) Consumer panels : an extension of the pantry audit approach on a regular basis , where a set of consumers are arranged to come to an understanding to maintain detailed daily records of their consumption and the same is made available to investigator on demands. 2 types – Transitory and Continuing.

e) Use of mechanical devices : to collect information by way of indirect means. Camera, audiometer etc are the examples used for the purpose of collecting required information by modern big business houses.

f) Projective techniques : developed by psychologists to use projections of respondents for inferring about underlying motives, urges etc. Play an important role in motivational researches or in attitude surveys.

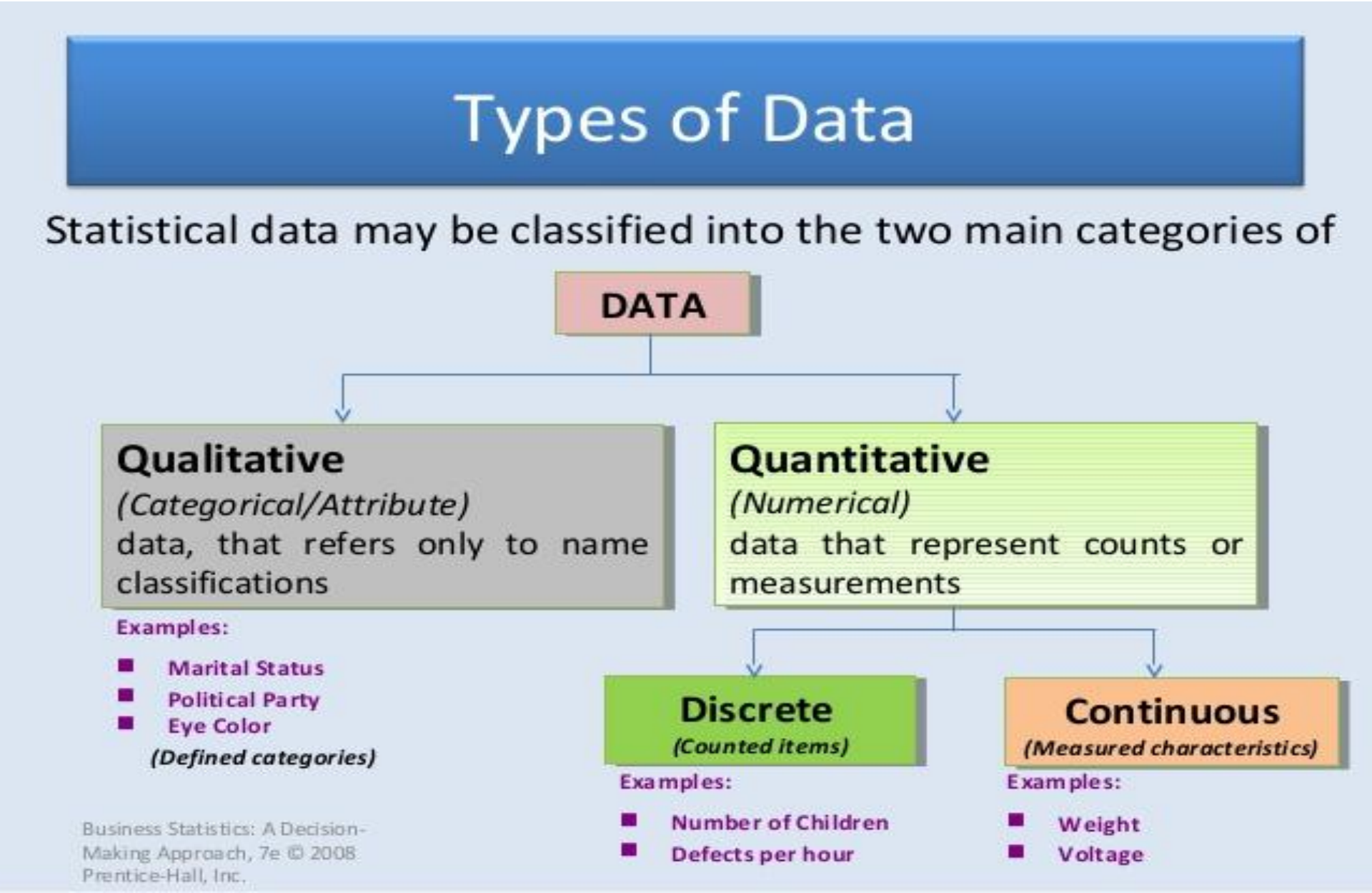
g) Depth interview: conducting intensive individual interviews with a small number of respondents to explore their perspectives on a particular idea, program / situation.

h) Content analysis : studying documents which might be texts of various formats, pictures, audio or video.

Collection of secondary data

- It means the data are already available, which have been collected and analyzed by someone else.
- Here, the interviewer not faced with the problems that are usually associated with the collection of original data.
- It may be either published / unpublished.
- Published data are available in various publications of central, state and local governments and foreign governments, technical and trade journals, books, magazines and news papers, reports prepared by research scholars, universities etc in different fields, public records and statistics and other sources of published information.

: Data Classification :



: Presentation of Data :

- Statistical data, once collected, must be arranged purposively, in order to bring out the important points clearly and strikingly.
- Hence the manner in which data is presented is of outmost importance.
- **Methods of Presentation of Data :**

1. Tables
2. Charts
3. Diagrams
4. Graphs, Pictures and Special curves.

TABULATION

- Tables are devices for presenting data simply from masses of statistical data.
- Tabulation is the first step before the data is used for analysis or interpretation.
- A table can be simple or complex, depending upon the number or measurement of a single set or multiple set of items.

Principles for designing the Table

- Table should be numbered like Table 1 etc.
- Title is must for table – brief and self explanatory.
- Headings of columns and rows should be clear and concise.
- Data must be presented according to the size / importance.
- Comparisons like % or averages should be placed closer.
- Avoid too large tables.
- Foot notes may be given, if necessary.

❖ 3 types of Tables :

1. Simple table
2. Frequency distribution table
3. Master table.

1. Simple table :

- In this characteristic under observation is fixed and the number or frequency of events is small.
- Ex:

State	Total Population
Uttar Pradesh	199,581,477
Maharashtra	112,372,972
Bihar	103,804,637
West Bengal	91,347,736
Andhra Pradesh	84,665,533
Madhya Pradesh	72,597,565

2. Frequency distribution table :

- In this table, the data is first split up into convenient groups (class intervals) and the number of items (frequency) which occur in each group is shown in the adjacent column.
- Ex :

Marks (Class-intervals)	Tally Marks	Number of Students (frequency)
1-10	𝍸 I	6
11-20	𝍸 𝍸 I	11
21-30	𝍸 III	8
31-40	𝍸 𝍸	10
41-50	𝍸	5
Total		40

3. Master table :

- In this table initial readings as per the designed proforma are serially recorded.
- When the number of observation is large and several attributes have to be studied, the master table/chart is must.
- PG scholars have to prepare master table for their thesis data presentation.

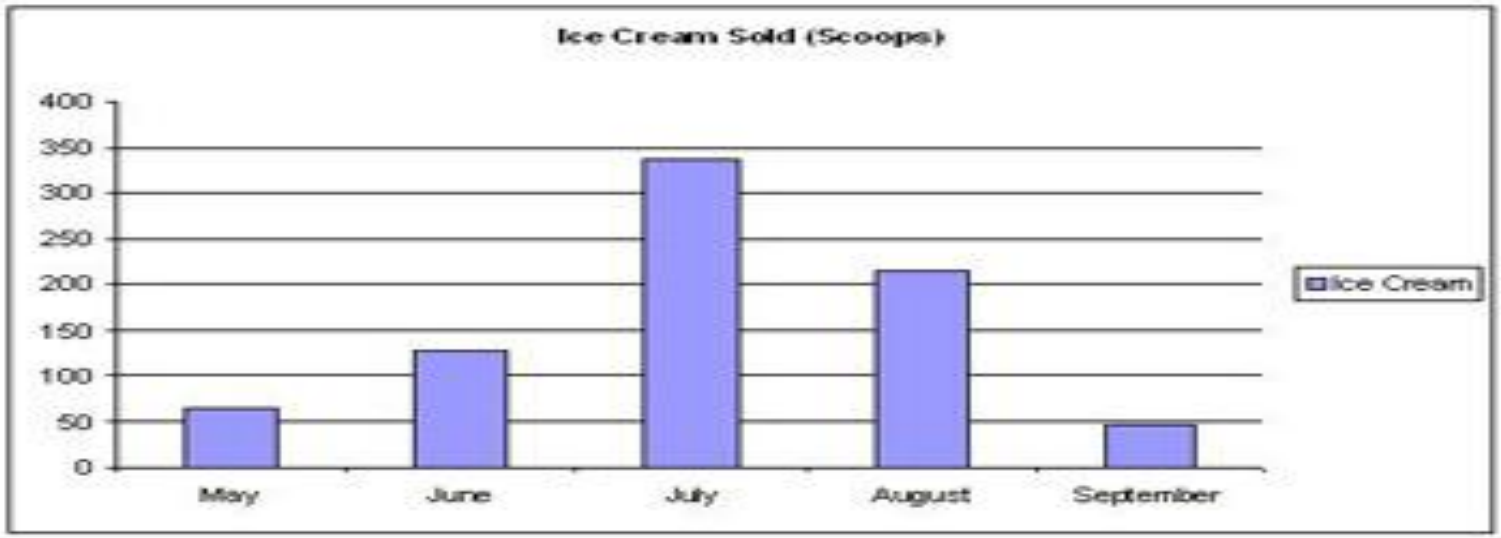
State/UT	Population			Number of literates			Literacy Rate		
	Total (millions)	Males (millions)	Females (millions)	Total literates (millions)	Males (millions)	Females (millions)	Total (%)	M (%)	F (%)
J & K	10.1	5.4	4.8	4.8	3.1	1.7	55.5	66.6	43.0
HP	6.0	3.1	3.0	4.0	2.3	1.8	76.5	85.3	67.4
Punjab	24.3	13.0	11.4	14.8	8.4	6.3	69.7	75.2	63.4
Chandigarh	0.9	0.5	4.0	0.6	3.8	0.3	81.9	86.1	76.5
Uttaranchal	8.5	4.3	4.2	5.1	3.0	2.1	71.6	83.3	59.6
Haryana	21.1	11.4	9.8	12.1	7.5	4.6	67.9	78.5	55.7
Delhi	13.9	7.6	6.2	9.7	5.7	3.0	81.7	87.3	74.7
Rajasthan	56.5	29.4	27.1	27.7	18.0	9.7	60.4	75.7	43.9

Charts and Diagrams

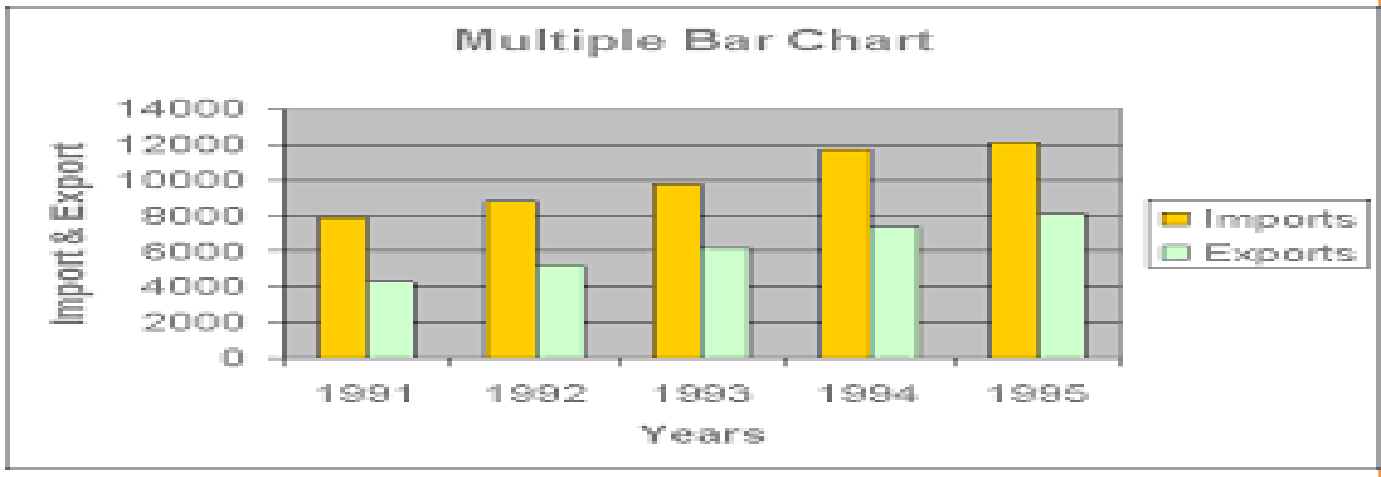
- Are useful methods of presenting simple statistical data.
- Have powerful impact on the imagination of people.
- Popular media of expressing data, specially in news papers and magazines.
- Diagrams are better retained in the memory than tables.
- Data must be simple to present.
- Lot of details of original data may be lost in charts and diagrams.

1. Bar chart : Simple, Multiple and Component

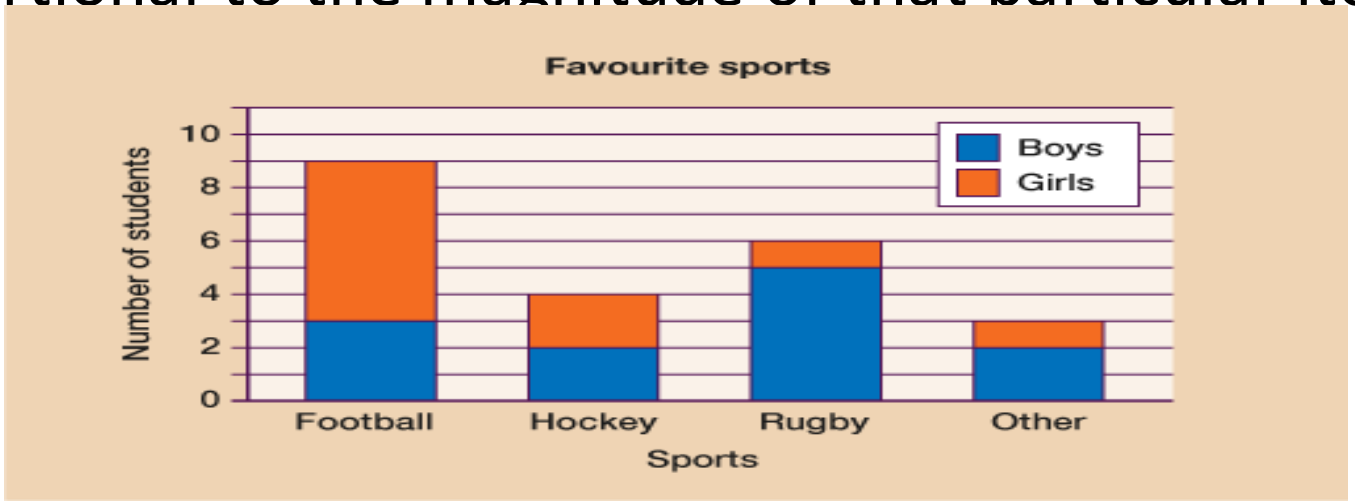
- Is a way of presenting a set of numbers by the length of a bar – the length of the bar is proportional to the magnitude to be presented.
- Popular because, easy to prepare, and enable values to be compared visually.
- **Simple Bar Chart** : Bars may be vertical or horizontal, separated by appropriate spaces for neat and clear presentation.



- **Multiple Bar Chart :** here 2 or more bars can be grouped together. Ex :

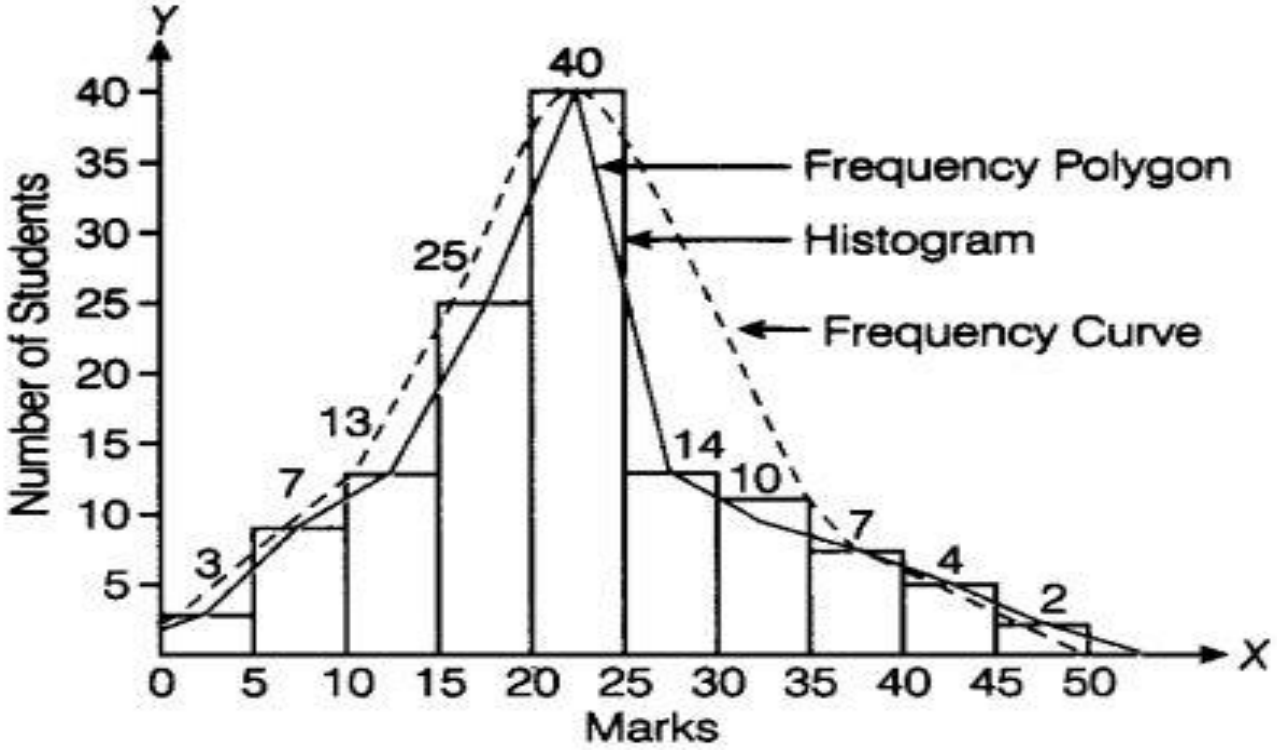


- **Component Bar Chart :** the bars may be divided into 2 or more parts. Each part representing a certain item and proportional to the magnitude of that particular item. Ex :



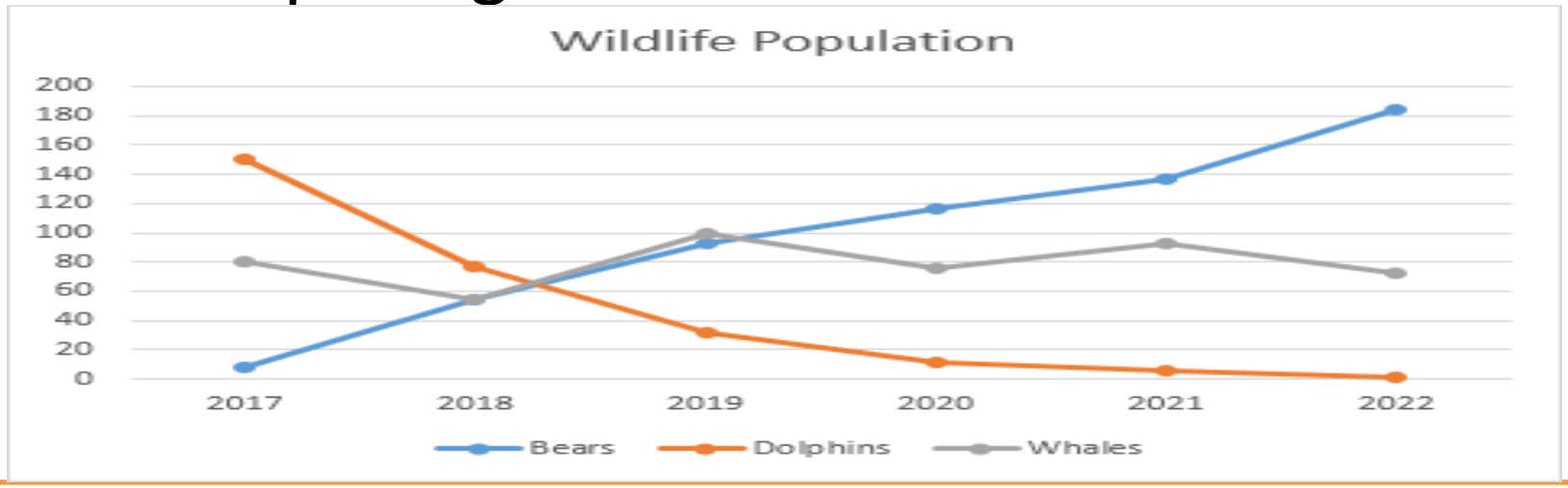
2. Histogram : frequency polygon and curve.

- It is a pictorial diagram of frequency distribution.
- It consists of a series of blocks.
- Class intervals are given along the horizontal axis and the frequencies along the vertical axis.
- The area of each block or rectangle is proportional to the frequency.



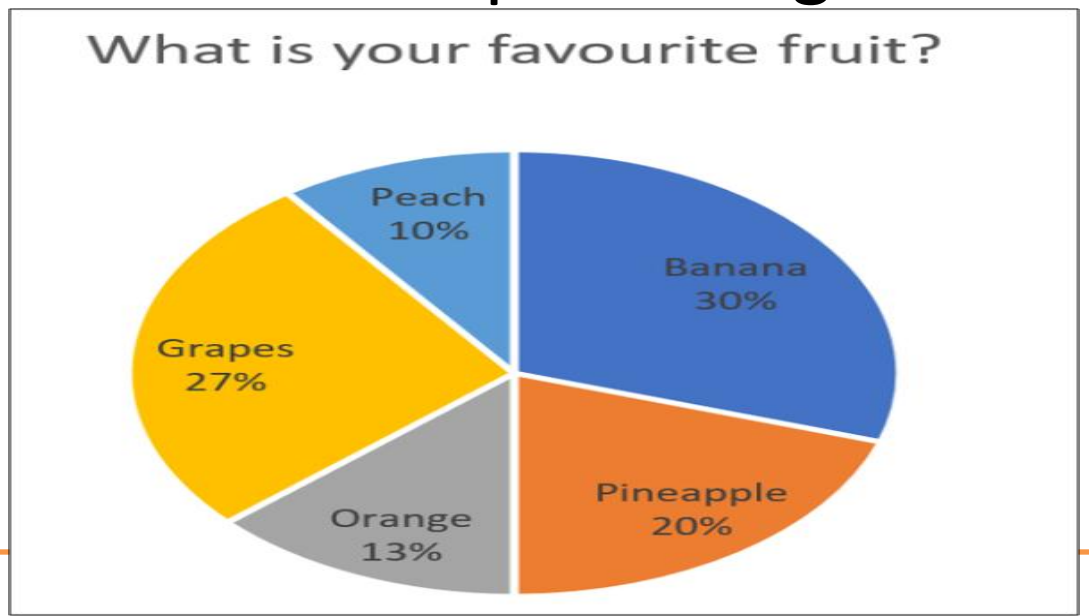
- **Frequency polygon :** it is simply a derivation from the histogram obtained by joining the midpoints of various histogram blocks.
- **Frequency curve :** when the number of observation is large, the polygon loses angulation and it becomes a frequency curve.

3. Line diagram : used to show the trend of events with the passage of time.



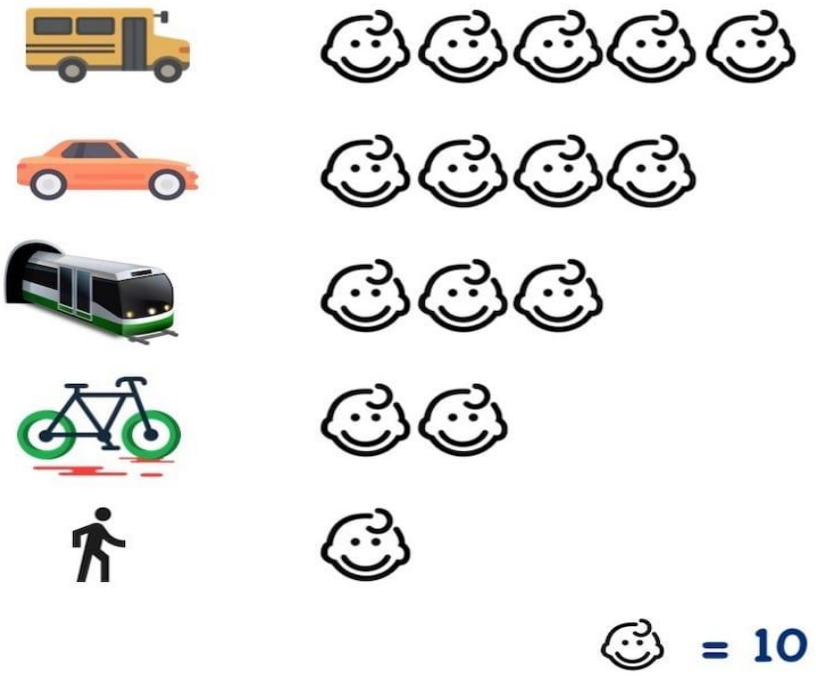
4. Pie charts :

- Instead of comparing the length of a bar, the area of segments of a circle are compared.
- These are popular for lay people but not for statisticians, who consider them inferior to bar charts.
- It is necessary to indicate the percentage in the segments.



5. Pictogram :

- Popular method of presenting data to the “man in the street” and to those who cannot understand orthodox charts.
- Small pictures or symbols are used to present the data.



: Vital Statistics :

- **Definition** : “Collection by government agencies of data relating to vital events such as births, deaths, marriages, divorces and health and disease related status and events which should be reportable by local health authority”.
- **Aims and Objectives :**

1. Population estimation and forecasting.
2. Analysis of health trends.
3. Programme planning, monitoring and evaluation.
4. Operational and administrative decisions.
5. Providing measures for health and disease of community.

Statistical Averages

- The word “average” implies a value in the distribution, around which the other values are distributed.
- It gives a mental picture of central value.
- Commonly used averages are ;

1. The Arithmetic Mean
2. Median and
3. The Mode.

1. The Mean :

- Widely used in statistical calculation.
- To obtain the Mean, the individual observations are first added together, and then divided by the number of observations.
- Formula : $\bar{X} = \sum X/n$ where,

1. X^- = X bar
2. $\sum$ = Sigma
3. X = individual value
4. n = sample size

- Ex : the diastolic blood pressure of 10 individuals was 83, 75, 81, 79, 71, 95, 75, 77, 84 and 90. the total was 810. the Mean is 810 divided by 10 = 81.0.
- Merits and Demerits.

2. The Median :

- Median is an average of different kind, which does not depend upon the total and number of items.
- To obtain the Median, the data is first arranged in an ascending or descending order of magnitude, and then the value of the middle observation is located, which is called as Median.
- Ex :

1, 3, 3, **6**, 7, 8, 9

Median = **6**

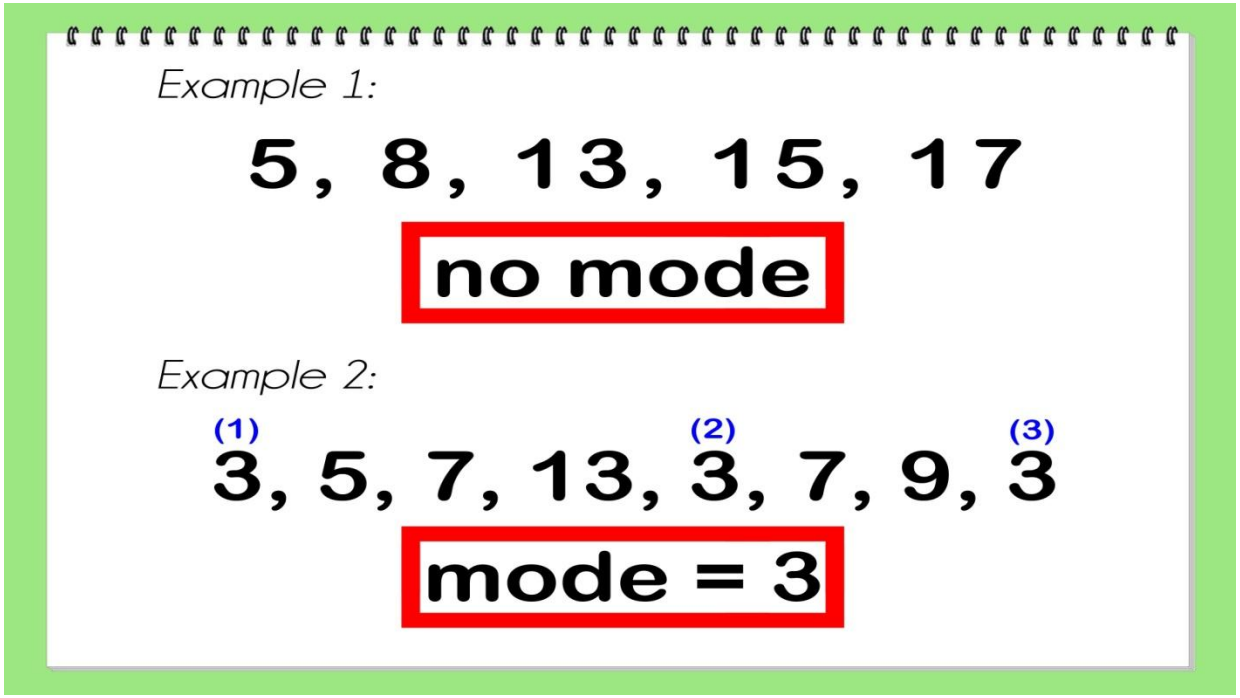
1, 2, 3, **4**, **5**, 6, 8, 9

Median = (4 + 5) ÷ 2

= **4.5**

3. The Mode :

- The mode is the commonly occurring value in a distribution of data.
- It is the most frequent item or the most fashionable value in a series of observations.
- Ex :



: Tools of Measurement :

1. Rates
2. Ratios
3. Proportions

❖ **Rates :**

- A rate measures the occurrence of some particular event in a population during a given time period.
- It is a statement of the risk of developing a condition.
- An example of a typical rate is the death rate. It is written as below:

- Death Rate = number of deaths in 1 year / Mid year population × 1000.
- Rate comprise the following elements ;

1. Numerator
2. Denominator – a) related to the population

i. Mid year population
ii. Population at risk
iii. Person time
iv. Person distance
v. Sub groups of population

b) Related to total events.

3. The time dimension is usually a calendar year.
4. The Rate is expressed per 1000 or some other round figure selected according to the convenience or convention to avoid fractions.

- **Various categories of Rates are ;**

1. Crude Rates : Actual observed Rates such as birth and death rates. Also known as unstandardized rates.
2. Specific Rates : Actual observed Rates due to specific causes or occurring in specific groups or during specific time periods.
3. Standardized Rates : These are obtained by direct or indirect method of standardization or adjustment.

❖Ratios :

- Another measure of disease frequency.
- It expresses a relation in size between 2 random quantities.
- The numerator is not a component of the denominator.
- Broadly ratio is the result of dividing one quantity by another.
- It is expressed in the form of x:y or x/y.

- **Sex Ratio** : It is defined as “the number of females per 1000 males”.
- Sex composition is the basic demographic characteristics of the population and its analysis plays vital role.
- It is affected by the differentials in mortality conditions of males and females, sex selective migration and sex ratio at birth.
- “Female deficit syndrome” is considered adverse because of social implications.
- Low sex ratio indicates strong male-child preference and consequent gender inequities, neglect of the girl child resulting in higher mortality at younger age, female infanticide and foeticide and higher maternal mortality.

- Sex ratio in India is generally adverse to women, i.e. the number of women per 1000 men has been less than 1000.
- Sex Ratio at Birth : affected by sex selectivity at birth. For India, for the year 2012-2014 it is 906. It is different from states to states and rural to urban areas.
- Child Sex Ratio : 0-6 years – census 2011 marks a considerable fall in child sex ratio in the age group of 0-6 years and has reached an all time low of 914 since 1961.

➢ Dependency Ratio :

- The proportion of persons above 65 years of age and children below 15 years of age are considered to be dependant on the economically productive age group (15-64 years).
- Formula :

$$\text{Total (Age) Dependency Ratio} = \frac{(\text{Population 0-14} + \text{Population 64>})}{\text{Working age population 15-64}} \times 100$$

$$\text{Child Dependency Ratio} = \frac{\text{Population 0-14}}{\text{Working age population 15-64}} \times 100$$

$$\text{Old-Age Dependency Ratio} = \frac{\text{Population 64>}}{\text{Working age population 15-64}} \times 100$$

❖ Proportion :

- It is a ratio which indicates the relation in magnitude of a part of the whole.
- Numerator is always include in the denominator.
- Expressed as a %.
- Example : the number of children with scabies at a certain time / total number of children in the village at the same time X 100.

FERTILITY RATES

1. Birth Rate
2. General Fertility Rate (GFR)
3. General Marital Fertility Rate (GMFR)
4. Age Specific Fertility rate (ASFR)
5. Age Specific Marital Fertility Rate (ASMFR)
6. Total Fertility Rate (TFR)
7. Total Marital Fertility Rate (TMFR)
8. Gross Reproduction Rate (GRR)
9. Net Reproduction Rate (NRR)
10. Child woman ratio ☺ ☺ ☺
11. Pregnancy Rate
12. Abortion Rate
13. Abortion Ratio
14. Marriage Rate : **respective values are given in age of fertility is generally taken as 15-49 years.**

$$\text{Birth rate} = \frac{\text{Number of live birth during the yr.}}{\text{Estimated mid yr. Population}} \times 1000$$

$$\text{GFR} = \frac{\text{Number of live births in an area}}{\text{Mid year female population age 15-44 (or 49) in the same area in same year}} \times 1000$$

$$\text{GMFR} = \frac{\text{No. of live births in a year}}{\text{Mid year married female population in the age group 15-49 year}} \times 1000$$

4. Age Specific Fertility Rate – ASFR:

ASFR = Number of live births in a particular age group / Mid year female population of the same age Group X 1000.

5. Age Specific Marital Fertility Rate – ASMFR:

ASMFR = Number of live births in a particular age group / Mid year married female population of the same age group X 1000.

6. Total Fertility Rate – TFR represents the average number of children a woman would have if she were to pass through her reproductive years bearing children at the same rates as the women now in each age group. TFR = 5x ∑ASFR/1000.

7. Total Marital Fertility Rate – TMFR:

TMFR = 5 X ∑ASMFR / 1000.

8. Gross Reproduction Rate – GRR:

- Average number of girls that would be born to a woman if she experiences the current fertility pattern throughout her reproductive span, assuming no mortality.
- GRR = 5 × ∑ASFR for female live births / 1000.

9. Net Reproduction Rate – NRR:

- The number of daughters a newborn girl will bear during her lifetime assuming fixed age specific fertility and mortality rates.

10. Child – woman Ratio: Estimated through data derived from censuses. It is the number of children 0-4 years of age per 1000 women of child bearing age.

11. Pregnancy Rate : It is the ratio of pregnancies in a year to married women in the ages 15 – 49 years.

12. Abortion Rate : the annual number of all types of abortion, usually per 1000 women of child bearing age.

13. Abortion Ratio : number of abortions performed during specific time period / number of live births during same time period.

14. Marriage Rate : it is the number of marriages in the year per 1000 population.

Confused????

Bored ????

Be confident today itself....because many more to come ☺

Mortality Rates

- Mortality : The number of deaths in one period of time or in one place.
- Mortality measurements :

1. It is more important, because it is the only data that is available in many countries.
2. Easy to collect.
3. Reasonably accurate.
4. Beginning point for many public study.

- Demerits :

1. Death may not be reported.
2. Cause of death and age of diseased may not be accurate.
3. Lack of uniform and standardized methods of collection of data.
4. If single cause of death is recorded, other associated conditions and risk factors may not be available.
5. Coding systems and diagnosing practices may change over time, affecting validity of data.
6. It is almost useless in case of mental illness.

Mortality Rates and Ratios

1. Crude Death Rate (CDR).
2. Specific death rates.
3. Case fatality ratio.
4. Proportional mortality ratio.
5. Survival rate.
6. Indicators of MCH care – will be discussed under MCH Programme.

1. **Crude Death Rate – CDR:**

- The number of total deaths occurring due to all causes per 1000 estimated midyear population in the given year in a given place.
- CDR = number of deaths during the year in a place / total mid year population of the same place and year × 1000.

2. **Specific death rates :**

- Cause or disease specific
- Specific groups like Sex, Age, Income etc.

I. Specific death rate due to AIDS = number of deaths from AIDS during an year / Mid year population X 1000.

II. Specific death rate for females = Number of deaths among females during an year / Mid year population of females X 1000.

III. Specific death rate in age group 15-49 year = Number of deaths of persons aged 15-49 during an year / Mid year population of persons aged 15-49 X 1000.

3. **Case fatality ratio** = Total number of deaths due to a particular disease / Total number of cases of same disease X 100.

4. Proportional mortality ratio :

I. Proportional mortality rate from a specific disease = Number of deaths from the specific disease in a year / Total deaths from all causes in the same year X 100.

II. Under 5 proportional mortality rate = Number of deaths under 5 year of age in a year / Total number of deaths during same year X 100.

III. Proportional mortality rate for aged 70 year and above = Number of deaths of persons aged 70 year and above / Total deaths in the same year X 100.

5. Survival rate = Total number of patients alive after 5 year / Total number of patients diagnosed and treated X 100. Diseases like Cancer, AIDS etc can be taken.

: INTERNATIONAL DEATH CERTIFICATE :

- Death certificate is the basis of mortality data, cause of the death is used for many purposes.
- The death certificate recommended by WHO for international use is shown in next slide.
- The death certificate also contains details of diseased like name, adress, age, religion, occupation, date of death.
- It should also have the stamp of medical practitioner or name of institution, serial number of institution and date of notification, along with signature of Medical Officer.

INTERNATIONAL FORM OF MEDICAL CERTIFICATE OF CAUSE OF DEATH

Cause of death		**Approximate interval between onset and death**
I Disease or condition directly leading to death*	(a)	.....
	due to (or as a consequence of)	
Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	(b)	.....
	due to (or as a consequence of)	
	(c)	.....
	due to (or as a consequence of)	
	(d)	.....
II Other significant conditions contributing to the death, but not related to the disease or condition causing it	.....	.....
	.....	.....

**This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury, or complication that caused death.*

Morbidity Rates

- Morbidity is defined as "any deviation, subjective or objective, from a state of physical or mental well being due to disease or accident".
- Units of measure : 1) Persons who are ill 2) The illness that these persons experienced and 3) The duration of these illness.
- Uses of Morbidity Data :

1. They give a picture of the extent, nature of disease burden in the community and help to decide of priorities.
2. They give comprehensive, accurate and clinically needed information on patient characteristics, that are required for basic research.
3. These are the basis for etiological studies and play vital role in prevention.
4. Required for monitoring and evaluation of disease control programmes.

Incidence

- Incidence rate is defined as "Ratio of the number of new cases occurring in a defined population", during a specified period of time to the population at risk in the same period, expressed as rate per 1000.
- **Incidence Rate (Persons)** = Number of new cases of specific disease during a given time period / population at risk during that period X 1000.
- **Incidence Rate (Spells)** = Number of new spells of illness occurring during a defined period / Population exposed to risk during that period X 1000.

- **Specific Incidence Rates :**

1. Attack Rate = Numbers of new cases of a specified disease during specified time interval / Total population at risk during the same interval × 100.
2. Secondary Attack Rate = Number of exposed persons developing the disease with in the range of incubation period / Total number of exposed or susceptibles × 100.
3. Cumulative Incidence Rate = Number of people who get disease during a specified period / Number of people free of disease in the population at risk at the beginning of the period × 100.

Prevalence

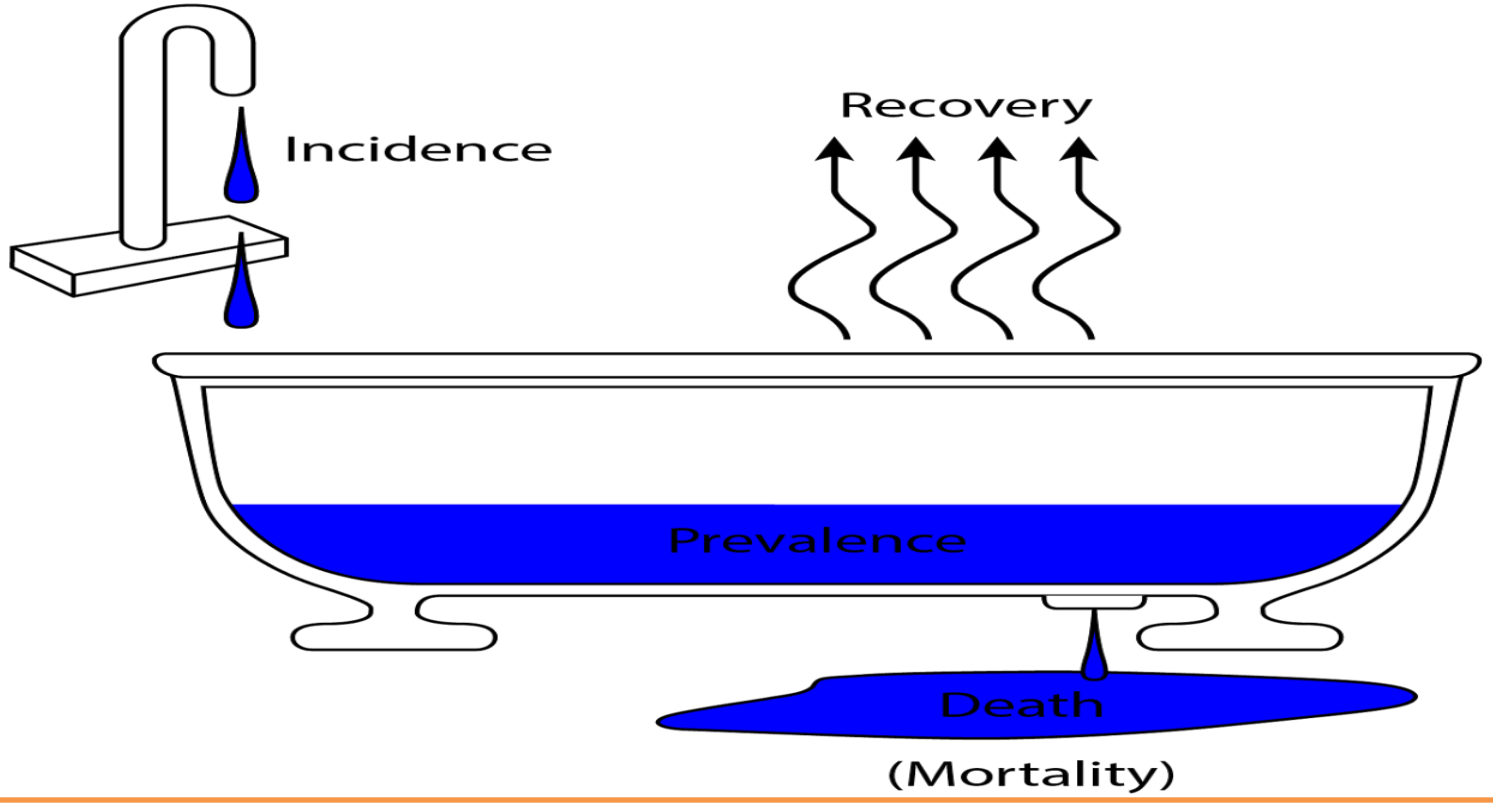
- Prevalence is the total number of cases (both old and new) existing at a given point of time or over a period of time in a given population.
- **Point Prevalence** : also called as Term prevalence rate. Usually point is a day, several days or few weeks. Point prevalence = Total number of cases (old and new) of a particular disease at a given point of time / Estimated population at same point of time X 100.
- **Period Prevalence** :it measures frequency of total number of cases (old and new) existing during specified period of time (Ex : annual prevalence) expressed in relation to a specific population. Period prevalence = Total number of existing cases (old and new) of a specific disease during a given period of time interval / Estimated mid interval population at risk X 100.

- **Relationship between prevalence and incidence**

P = I × D, where P = Prevalence

I = Incidence and

D = mean Duration.



Health Survey

- Health survey is basically a program for studying a population or a particular segment of a population in order to assess its health problems or to detect conditions to which preventive measures may be applied.
- Community health surveys should always be planned with the intent of carrying out an appropriate action program. These could be limited to examination and referral or could also include provision of treatment facilities.

- National Family Health Surveys are nationwide surveys conducted under the Ministry of Health and Family Welfare, Government of India.

➢ 3 NFHS surveys conducted are a major landmark in the development of a demographic and health data base for India.

➢ NFHS use standardized questionnaires, sample design and field procedures to collect data.

➢ The information provided by NFHS surveys assists policymakers and programme administrators in planning and implementing population, health and nutrition programmes.

- The MOHFW designated the International Institute for Population Sciences (IIPS), Mumbai as the nodal agency for each of the three rounds of NFHS.
- Each round of NFHS has 2 goals;

1. To provide essential state and national level data to monitor health and family welfare programmes and policies implemented by the MOHFW and other ministries and agencies.
2. To provide information on important emerging health and family welfare issues.

- Health surveys in Indian schools indicate that morbidity and mortality rates of children are among the highest in the world.


THANK YOU