# Descriptive + Case control studies

## Training 1:

**Novel Coronavirus (SARS-CoV-2) in Febrile Infants in New York**

**Introduction:** The 2019 novel coronavirus (SARS-CoV-2) has spread rapidly across the globe since it was identified in January 2020. The Chinese Center for Disease Control and Prevention reported that only 1% of cases (416 out of 72 314) whether confirmed or suspected cases were found in in children <10 years of age.

**Case presentation**: Three febrile infants <2 months of age admitted to a large tertiary care children's hospital in New York. All 3 patients presented with fever, feeding difficulty, lymphopenia, thrombocytosis on laboratory evaluation and 2 out of the 3 sick infants were found to have neutropenia. All 3 patients subsequently found to be infected with severe acute respiratory syndrome coronavirus.

## Questions & Answers:

**1- Which of the following represents this type of the study design?**

A) Case report.
B) Case series.
C) Cohort study.
D) Case control study.
E) Cross sectional study.

**2- Which of the following is among the application of this study design?**

A) Study multiple risk factors.
B) Estimate the prevalence rate.
C) Describe previously un-described disease.
D) Describe association between exposure and outcome.
E) Describe a number of similar cases with a given disease in one report.

## Training 2:

**Diet and Alzheimer's Disease**

- exp
- out come

A multi-country study links between diet and Alzheimer's disease have been conducted using the national survey prevalence of Alzheimer's disease in 11 countries along with dietary supply factors. It found that total fat and total caloric supply were strongly correlated with prevalence, while fish and cereals/grains were inversely correlated. Diet is now considered an important risk-modifying factor for Alzheimer's disease.

**Questions:**

**1- What is the type of this epidemiologic study?** Correlation study

**2- What are the applications of this study design?** Comparing Population in other Country in same time

**3- Mention the other types of studies which belong to that category?**
Case report - Case series - Cross sectional - Longitudinal

## Training 3:

**Prevalence of Obesity in a Saudi Obstetric Population**

A study done by El-Gilany & El-Wehedy involved 791 women registered for antenatal care in primary health care centers in Saudi Arabia. The objectives were to measure body mass index (BMI) & assess the prevalence of obesity. Weight & height were abstracted from maternal records. BMI was calculated as weight (kg)/height² (m). They found that 67, 311, 187 & 226 women were underweighted, normal weight, overweight and obese, respectively.

**Questions:**

1- **Mention the study design?** cross sectional study

2- **Calculate the prevalence of obesity among the study population?** $\frac{226}{791} \times 100$

3- **What are the disadvantages of this study design?** not use in acute disease / highly fatal, not calculate incedince – not determine if expose effected disease or not

## Training 4:

**The natural history of primary dysmenorrhoea:**

**Background:** Dysmenorrhoea is a common condition among women.

**Objective:** To describe the course of primary dysmenorrhoea in women of all reproductive ages.

**Population**: We analyzed data from 404 women who responded to both surveys, but denied endometriosis, pelvic inflammatory disease or uterine fibroids.

**Methods:** Participants were surveyed twice at an interval of six years regarding menstrual cycle characteristics.

**Questions:**

**1- What is the type of this epidemiologic study?** Longitudinal study

**2- What is the outcome of this study design?** incidence rate

**3- Mention the other types of studies which belong to that category.** Case report ~ series Cross sectio

## Training 5:

**A study to identify risk factors for acute hepatitis C virus infection in Egypt:**

**Background:** Identification of risk factors of acute hepatitis C virus (HCV) infection in Egypt is crucial to develop appropriate prevention strategies.

**Methods**: A study was carried out from June 2007-September 2008 to investigate risk factors for acute HCV infection in Egypt among 86 patients and 287 age and gender matched controls identified in two infectious disease hospitals in Cairo and Alexandria. Case-patients were defined as: any patient with symptoms of acute hepatitis; lab tested positive for HCV antibodies and negative for HBsAg, HBc IgM, HAV IgM; and 7-fold increase in the upper limit of transaminase levels. Controls were selected from patients' visitors with negative viral hepatitis markers. Subjects were interviewed about previous exposures within six months, including community-acquired and healthcare associated practices. Case-patients were more likely than controls to have received injection with a reused syringe (OR= 23.1).

**Questions:**

**1- What is the type of this epidemiologic study?** Case Control

**2- What is the outcome of this study design?** Relative Risk (Contribution) – Odds Ratio

**3- Which of the following characterize this study design?**

A) It is a retrospective study.
B) Relative risk can be measured.
C) Incidence rates can be calculated.
D) It proceed from cause to outcome.
E) It is an observational descriptive study.

**4- - The underlined number indicates that:**

A) Syringe injection is not a risk factor for HCV at all.
B) Syringe injection is a protective factor for acute HCV.
C) No association between acute HCV and syringe injection.
D) Increased exposure to syringe injection leads to increased acute HCV infection. OR > 1
E) Odd of exposure to syringe infection among controls/Odd of exposure to syringe infection among cases= 23.1

**5- Advantage of this study design includes:**

A) Study rare diseases.
B) Useful in rare exposure.
C) Incidence rate can be calculated.
D) Less bias in selection of the control.
E) It is an expensive and time-consuming study.

## Training 6:

**Study the relation between smoking and lung cancer:**

| Smoking | Lung cancer | Controls |
|---|---|---|
| Smokers | a 16 | b 8 |
| Non smokers | c 2 | d 24 |
| Total | 18 | 32 |

**Questions:**

1- **Calculate proportion of exposure among lung cancer cases and controls.**

2- **Calculate odd of exposure among lung cancer cases and controls.**

3- **Calculate odds ratio, interpret the result.**

## Training 7:

**Questions & Answers:**

1- **To determine an odds ratio, which of the following studies a researcher can follow?**

A) Cohort study.
B) Case-control study.
C) Longitudinal study.
D) Cross-sectional study.
E) Randomized clinical trial.

disease risk factor → Cause - expose

**3- Researchers want to know whether low birth weight (LBW) is associated with the maternal smoking during pregnancy. The researchers obtained smoking history from mothers with LBW infants and comparing it with smoking histories of an equal number of mothers with normal LBW. What type of this study?**

A) Cohort study.
B) Prospective study.
C) Case-control study.
D) Cross-sectional study.
E) Randomized Clinical trial

# Analytic studies (cohort study)

**Training 1.a**

**Match each study with the correct definition:**

**A. Cross-Sectional** **B. Cohort** **C. Case-Control**

Diabetics are compared with non-diabetics to assess its relationship with junk food. (C)

2. A study of women aged 50–60 years in a community located close to a nuclear power facility. (A)

3. Subjects who exercise twice a week are compared with subjects who do not to investigate the effect of exercise on obesity. (B)

**Training 1.b**

- **Which of the following characterize cohort study?**

a) It is an observational analytical study

b) It proceeds from outcome to cause

c) Prevalence rates can be calculated incidence

d) Odds ratio can be measured Case Control

**Training 1.c**

- **Which study design is best for rare exposure?**

a) Cohort study

b) Case-control study

c) Randomised controlled trial

d) Case-crossover study

**Training 2**

**You want to estimate the incidence of depression following accidental trauma. Which the following study design would be most suitable for your research question?**

a) Cohort study

b) Case-control study

c) Randomised controlled trial

d) Case-crossover study

**Training 3**

**A research team follows 2000 HBsAg positive patients and a similar group of HBsAg negative at outpatient clinics over 15 years to determine the rate of occurrence of hepatocellular carcinoma.**

**This study is example of:**

A. Case control study.

B. Prospective Cohort study.

C. Cross section study.

D. Experimental study.

| | Lung Cancer | non lung Cancer | Total |
|---|---|---|---|
| smoker | 20 | 1980 | 2000 |
| non smoker | 5 | 4995 | 5000 |

**Training 4**

- **Over a period of 20 years, lung cancer occurred in 20 people among 2000 smokers and 5 persons out of 5000 non-smokers.** $I_e = \frac{20}{2000}$
- **1. construct a 2x2 table for the above data** $I_n = \frac{5}{5000}$
- **2. calculate the relative risk of developing carcinoma lung in smokers** $= \frac{I_e}{I_n} = 10$

smoker higher risk factor than non smoker

**Training 5**

A study of Heart disease and smoking among British physicians reported these results.

**Table: Annual death rates per 100000 persons**

| | Heart Diseases | No Heart Diseases | Total |
|---|---|---|---|
| Heavy smokers | 599 a | 99401 b | 100000 |
| Non-smokers | 422 c | 99578 d | 100000 |

Calculate and interpret relative risk of dying from heart disease $RR = \frac{I_e}{I_n} = \frac{599}{422}$

$I_e = \frac{599}{100000}$

$I_n = \frac{422}{100000}$

Heavy smokers higher than non smoker

RF

**Training 6**

**A study examined the relationship between body mass index (BMI) and all-cause mortality in US cohort who were 50 to 71 years old for a year.**

Relative risk was calculated to measure the association between abnormal BMI and the risk of all-cause mortality (the abnormal BMI groups versus the normal BMI group)

Table: Relative risk of death in men aged 50 to 71 years across BMI categories.

| BMI at age 50 | Relative Risk |
|---|---|
| <18.5 | 1.29 |
| 18.5 to 24.9 | Comparison group normal Value |
| 25.0 to 29.9 | 1.31 |
| 30.0 to 34.9 | 1.96 |
| 35.0 to 39.9 | 2.46 |
| ≥ 40 morbid obese | 3.82 |

فسر **Interpret relative risk in the table across BMI categories**

- ↑ BMI above 25 (upper limit of normal Value)
- Risk of death ↑↑
- highest RR = 3.8 BMI ≥ 40

Risk of death more in morbid obese

3.82 Time more than normal

- BMI < 18.5 , 1,29 time normal

## Role of screening in diagnosis of disease

**Training (1)**

On evaluation of tuberculin skin test as screening test for tuberculosis, a cut off value of 10 mm was considered to be positive. The following results were found:

| Tuberculin skin test | Tuberculosis disease | |
|---|---|---|
| | Present | Absent |
| ≥ 10 mm | a 40 TP | b 20 FP |
| < 10 mm | c 10 FN | d 130 TN |

50 150 = 200

**Calculate:**

1. **Sensitivity** $\frac{a}{a+c}$
2. **Specificity** $\frac{d}{b+d}$
3. **Positive predictive value** $\frac{a}{a+b}$
4. **Negative predictive value** $\frac{d}{c+d}$
5. **Accuracy** $\frac{a+d}{a+b+c+d}$
6. **Prevalence of tuberculosis in the study population** $\frac{50}{200}$

**Training (2)**

You apply a new test to serum taken from a 320 newborns to detect infection with a virus. Test results were positive in 100 of these newborns but only 70 of them were found to harbour the virus when viral cultures were performed (viral isolation is considered to be the Gold Standard). When samples were cultured from test negative newborns, 20 returned a positive culture. Assume the 320 newborns were representative of the population that exists in your practice region. You want use this test to screen all newborns in your practice.

**Answer the following questions:**

1. **Construct a 2 x 2 table of the results of the study.**
2. **Assess validity of the studied screening test.**
3. **Calculate the positive predictive and negative predictive values of the test.**

| | Yes | No | |
|---|---|---|---|
| + | 70 (a) | 30 (b) | 100 |
| − | 20 (c) | 200 (d) | 220 |
| | 90 | 230 | 320 |

Sens = $\frac{70}{90}$

Spec = $\frac{200}{230}$

+ Predictive = $\frac{70}{100}$

− Predictive = $\frac{200}{220}$

| | Yes | No | |
|---|---|---|---|
| + | a 186 | b 14 | 200 |
| − | c 4 | d 3796 | 3800 |
| | 190 | 3810 | 4000 |

PPV (93) = a / 200

NPV (99.9) = d / 3800

Validity: Sens, Spec

186/190

3796/3810

**Training (3)**

Breast mammography which has a PPV of 93% and a NPV of 99.9% is used to screen 4,000 women for breast cancer. Five percent of the women (200 women) have positive test results and 95% (3800 women) have negative test results.

1. **Construct the 2x2 table for the results**

2. **Assess validity of the studied screening test.**

**Training (4):**

**The findings of a test using a screening level of 130mg% of blood sugar (random) are shown in the following table:**

| Screening test | Disease status | |
|---|---|---|
| | Diabetic | Nondiabetic |
| **Positive** | (a) 86 | (b) 98 |
| **Negative** | (c) 84 | (d) 9752 |

1. **The ability of the screening test to correctly identify those who have diabetes is:** Sensitivity

$$\frac{a}{a+c} = \frac{86}{86+84} \times 100$$

A. 40%
B. 51%
C. 60%
D. 75%
E. 99%

2. **The ability of the screening test to correctly identify those who have the disease from all those who test positives:**

$$PPV = \frac{a}{a+b} = \frac{86}{86+98} \times 100$$

46.7 %

A. 39%
B. 52%
C. 66%
D. 88%
E. 90%

**Training (5):**
**On assessment of three new screening tests, the following diagram represent the results of 100 trials for each test. Describe and comment on each diagram.**

- Not Valid
- Not Reliable

Reliable

all Valid are Reliable

**(A)**

**(B)**

Valid

**(C)**

**Training (6): Multiple Choice questions**

**1- The proportion of people without disease who are correctly classified by a screening test as negative is called:**

a) Positive predictive value
b) Sensitivity
c) Prevalence
d) Specificity
e) Incidence

**2- Which of the following characterize screening test:**

a) More accurate
b) A basis for treatment
c) Used on community basis
d) More expensive
e) Confirm the diagnosis

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**3- The property of a test to identify the proportion of free persons (not diseased) in a population who are identified as negative by a screening test.**

a) Sensitivity
b) Specificity
c) Positive predictive value
d) Negative predictive value

**4- In a population of 1000 persons tested for hepatitis C, 5 positives are identified using a perfect test. What is the sensitivity of the test being used?**

a) 0.5%
b) 99.5%
c) 100%
d) Cannot be determined

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**5- In screening test, of reliability, repeatability, validity and accuracy which pair is analogous?**

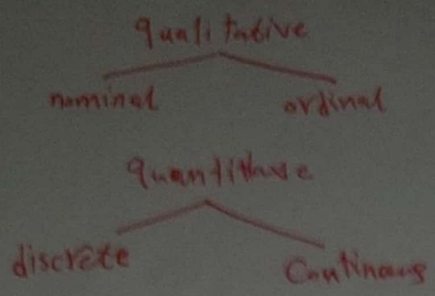
a) Validity is analogous to repeatability.
b) Reliability is analogous to accuracy.
c) Validity is analogous to reliability.
d) Validity is analogous to accuracy.

**6- In a communicable disease with high mortality, tests must be:**

a) Highly sensitive
b) Highly specific
c) Easy to perform
d) Economical

**7. A screening test is negative in the majority of free individuals but false negatives is much higher than true negatives, this indicates:**

a) Low PPV
b) Low NPV
c) Low accuracy
d) High validity
e) High specificity




# medical statistics1

**Training 1:**

**State the type of variable& summarizing value for each of the following:**

| Biological variables | Type of variable |
|---|---|
| Blood pressure in mmHg | Quantative Continous |
| Cholesterol in Mmol/L | Quanti tive Continous |
| diabetes (YES/NO) | Qualtative nominal |
| BMI (Kg/m2) | Quantative Continous |

Quantative

**Blood pressure (mmHg) is a** Continous **variable, but when expressed as hypotensive,** stage **normotensive, and hypertensive is considered as** Qualtative ordinal **variable.**

**The number of patients with HCV is** Quantative discrete

## Training (2): MCQ

**1. Which of the following techniques yields a simple random sample?**

a. Choosing volunteers from 4th year medical students to participate ×

b. Listing the individuals by blood group and choosing a proportion from within each blood group at random. × stratified

c.Numbering all the elements of a sampling frame and then using a random number table to pick cases from the table.

d. Randomly selecting schools, and then sampling everyone within the school. × cluster

E. Not all the individuals have equal chance to be in the sample ×

## Training (3):

**Match each description of a sampling procedure with the correct term.**

a. Systematic sampling

b. Simple random sampling

c. Stratified sampling

d. Cluster sampling

(b) **1. Each individual of the total group has an equal chance of being selected.** simple

(d) **2. Households are selected at random, and every person in each household is included in the sample.** cluster

(a) **3. First individual is selected randomly, and every fourth subject is selected.** systematic

(c) **4. Individuals are divided into subgroups on the basis of specified characteristics and then random samples are selected from each subgroup** stratified

## Training (4):

**Calculate Median- Mean for the following set of data:**

| Serial | Weight (Kg) | Height (cm) |
|---|---|---|
| 1 | 70 | 160 |
| 2 | 75 | 168 |
| 3 | 67 | 179 |
| 4 | 80 | 158 |
| 5 | 79 | 160 |

**Weight** 67 - 70 - 75 - 79 - 80

Median= 75 mean= مجموعهم / عددهم = 74.2

**Height** 158 - 160 - 160 - 168 - 179

median= 160 mean= 165

## Training (5):

**1-What are the types of the three variables?**

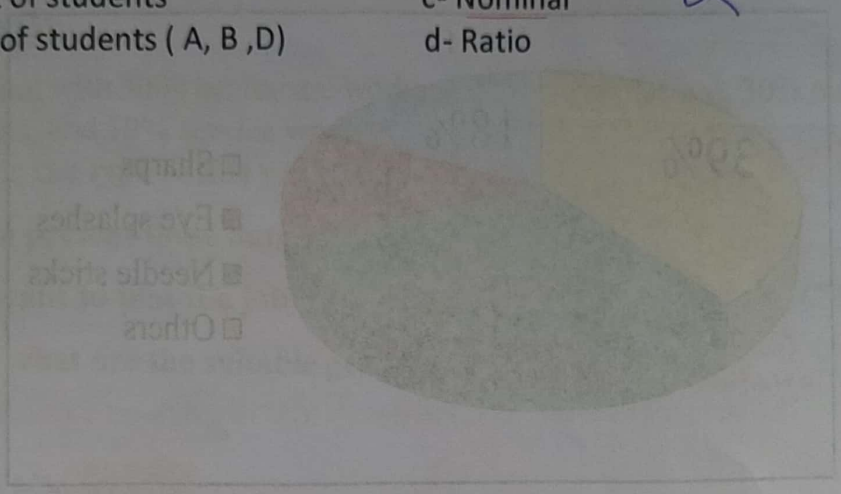
Sex, residence BMI Quantative Continous

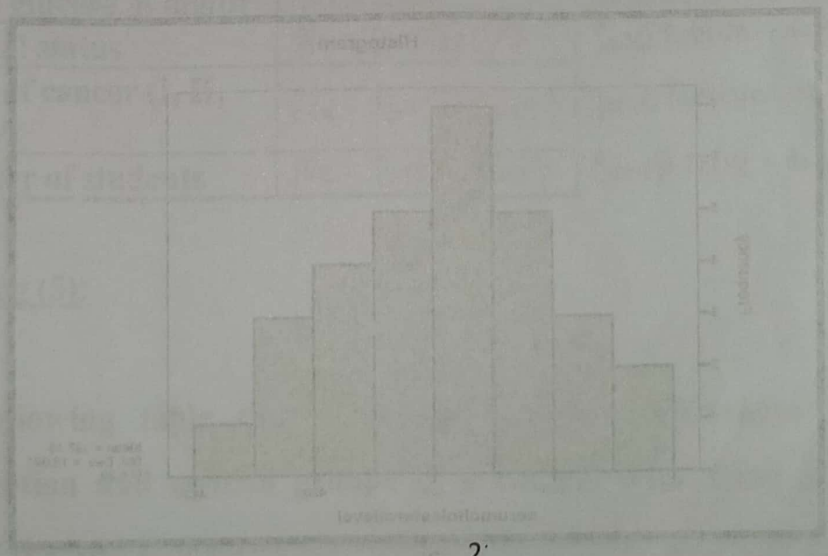
ualitative
nominal

## Training (6):

**Match the measurement with the data type. Drag the data type in the correct box:**

| | | |
|---|---|---|
| 1- color of shirt | a- Ordinal | مش عليا |
| 2- Temperatures in F | b- Interval | |
| 3- weight of students | c- Nominal | ✗ |
| (٩) 4- Grade of students ( A, B ,D) | d- Ratio | |

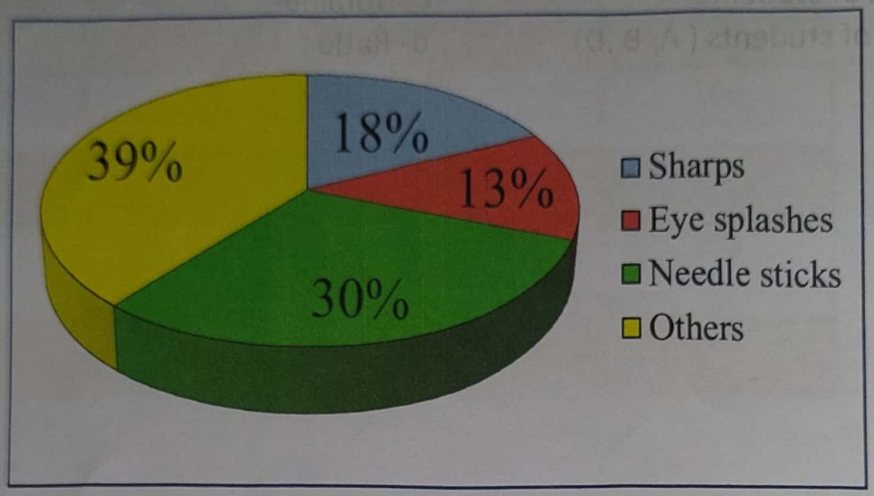




# medical statistics 2

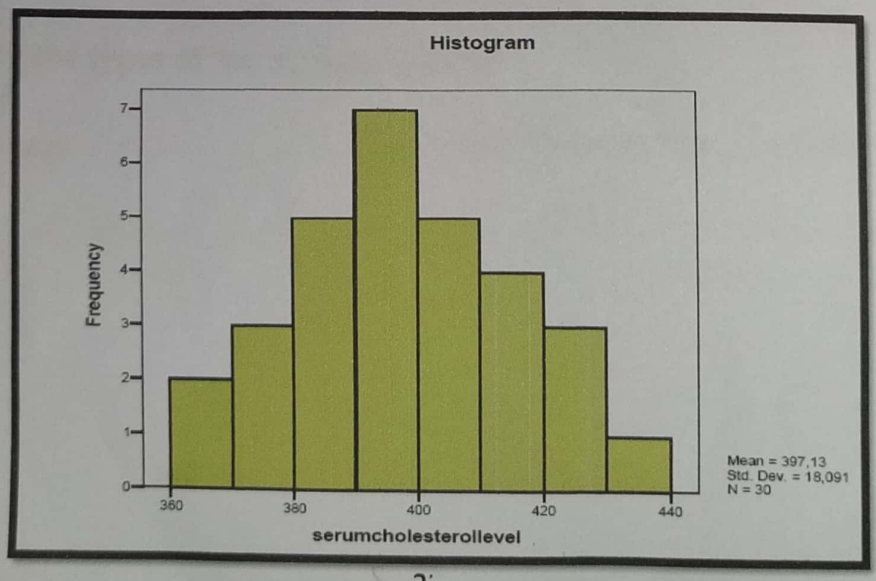
**Training (1):**

**Look at the following figure then answer:**




1. **What is the type of this graph?** Pie chart
2. **What is the type of variable presented by this graph?** discrete - qualitative
3. **Could other types of graphs present the same type of data?** Bar - Map chart

**Training (2)**




1.

2.

2. *Figure1.* Serum cholesterol (mg/dL) of 30 diabetic patients at MUH, 2010

3.

1. **What is the type of this graph?** Histogram
2. **What is the type of variable presented by this graph?** Continous data - Quantitative
3. **Could other types of graphs present the same type of data?** Frequency Polygon - Smooth curve

## Training (3):

In a hospital with 3000 healthcare workers, 50% are physicians, 30% nurses, 10% technicians, and 10% service workers.

1. **What is the type of this variable?** "Job title" discrete - Qualitative data
2. **How to present these data?** Pie - Bar chart
3. **If we want to plot the job title together with the gender of HCWs in that hospital, what are the suitable graphs?** 2 Component < multiple Component Bar chart

## Training (4)(Activity):

**Complete the following table**

| Variable | Presentation | |
|---|---|---|
| Age in years | Histogram | Quantitive Continous |
| Gender | Pie - Bar chart | Qualitative nominal |
| Blood group | Pie - Bar chart | Qualitative nominal |
| Blood glucose in mg/dl | Histogram | Quantitive Continous |
| Marital status | Pie - Bar chart | Qualitative nominal |
| Stage of cancer (I, II, III, IV) | Pie - Bar chart | Qualitative ordinal |
| Number of students | Pie - Bar chart | Quantitative discrete |

## Training (5):

**The following table shows the age and sex differences between the intervention and control groups in a clinical trial. Read carefully then answer the questions:**

2:

| Variables | Intervention (n=19) | | Control (n=25) | | Test of significance | P-value |
|---|---|---|---|---|---|---|
| | No | % | No | % | | |
| **Age/years** | | | | | | |
| Mean ± SD | 11.84 ± 3.43 | | 12.14 ± 3.03 | | t = 0.30 | 0.76 |
| Min-Max | 3-16 | | 6-17 | | | |
| ≤12 | 12 | 63.2 | 16 | 64.0 | $\chi^2$=0.003 | 0.95 |
| >12 | 7 | 36.8 | 9 | 36.0 | | |
| **Sex** | | | | | | |
| Male | 12 | 63.2 | 11 | 44.0 | $\chi^2$=1.58 | 0.20 |
| Female | 7 | 36.8 | 14 | 56.0 | | |

1. What are the types of variables in the above table? Quantitate Continous
2. What are the measures of central tendency and dispersion available in the above table? mean SD
4. What is the interpretation of p value? P ≥ 0.05 accept null hypothesis

## Training (6): MCQ Activity)

1) measure of dispersion of a set of observations in which it is calculated by the difference between the highest and lowest values produced is called:

a) standard deviation

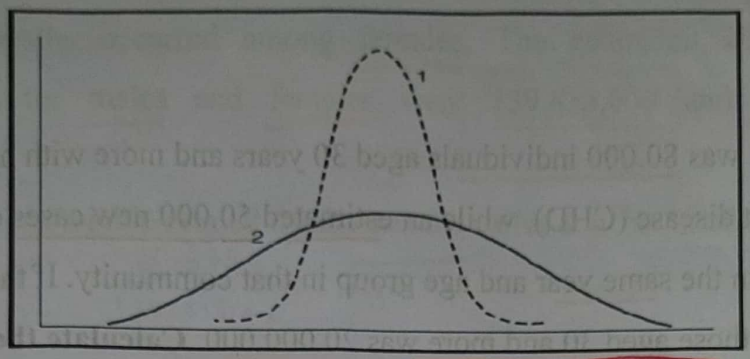
b) variance

c) range

d) mode

e) mean

**3) Consider the following two distribution curves. Which numerical summary measure would allow you to discriminate between the two distributions?**




**a. Median** **b. Mean** **c. Mode** **d. Standard deviation** **e. Range**

**4) The normal distribution curve is determined by**

a) Mean and sample size
b) Range and sample size
c) Range and standard deviation
d) Mean and standard deviation

normal date distribution
mean = median = mode
3 SD

**(5) In a population of 100 females in the age group of 15-45, the mean systolic BP was found to be 120. In a normal curve distribution, the number of people who would have an average BP above 120 will be:**

A. 25
B. 50
C. 75
D. 95
E. 85

symmetrical
100 / 2 = 50

# Morbidity and Mortality statistics

**Training 1**

In 1990, there was 80.000 individuals aged 30 years and more with history of coronary heart disease (CHD), while an estimated 50.000 new cases of CHD was reported in the same year and age group in that community. If the total population of those aged 30 and more was 20.000.000. **Calculate the incidence and prevalence rate of CHD in this community.** $\frac{50,000}{20,000,000} = 25000$ $\frac{50,000 + 80,000}{20,000,000} = 65000$

**Training 2**

A study was done to investigate an outbreak of meningococcal meningitis in a city with 80,000 populations. A total of 721 cases were recorded at the local hospital during a period of one week. The daily number of cases is: 50, 70, 100, 200, 150, 100, and 51. Fifty-eight deaths were recorded among the admitted patients.

Calculate case fatality rate. $= \frac{\text{total death}}{\text{total Cases}} = \frac{58}{721} \times 100 = 8.04 \Rightarrow 8\%$

**Training 3**

In 2018, in a community the estimated midyear population was one million (450.000 males and 550000 females. The number of deaths was 30.000 death among them 14000 were males. 16000 female death

Calculate the following:

The crude death rate of the same year. $\frac{\text{total death}}{\text{estimated mid year}} = \frac{30,000}{1000\,000} \times 1000 = 30$

The female death rate for this country.

$= \frac{\text{total death of female}}{\text{total number of female}} = \frac{16000}{550000} \times 1000 = 2.9$

**Training 4**

In 2019, a total of 15,555 homicide deaths occurred among males and 4,753 homicide deaths occurred among females. The estimated 2001 mid-year populations for males and females were 139,813,000 and 144,984,000, respectively.

Calculate the homicide-related death rates for males and for females.

$\frac{15,555}{139,813,000} \times 100,000$ $\frac{4,753}{144,984,000} \times 100,000$

**Training 5**

In an epidemic of Hepatitis A traced to green onions from a restaurant, 555 cases were identified. Three (3) of the case patients died as a result of their infections.

Calculate the case-fatality rate. $\frac{\text{total death}}{\text{total cases}} = \frac{3}{555} \times 100 = 0.54$

**Training 6**

specific cause

1- **If the number of deaths from tuberculosis is expressed in relation to the total mid-year population, it is:**

a) Case fatality rate ×

b) Age specific death rate ×

c) Proportionate mortality rate ×

d) Crude death rate ×

e) Cause specific death rate

**2- Which of the following mortality rates use the estimated mid-year population as its denominator?**

① crude ② Case specific

a) Age-specific death rate

b) Sex-specific death rate

2

c) Case fatality rate

d) Crude death rate

e) Proportionate mortality rate

**3- In a country, estimated mid-year population is 1 million and total number of deaths is 15,000. Crude death rate is:**

15,000 / 1000,000

15 / 1000

a) 15 per 1000 persons

b) 15 per 100 persons

c) 150 per 1000 persons

d) 150 per 100 persons

e) 15 per 10000 persons

(المعلم)

**4- Denominator of maternal mortality rate:**

a) Estimated mid-year population ×

b) Live birth ×

c) Female in childbearing period (15-49)

d) Married females in childbearing period (15-49)

e) Females in a specific age group ×

**5- If the number of deaths from road traffic accidents is expressed in relation to the total number of deaths from all causes, it is……**

a) Case fatality rate Cases

b) Age specific death rate ×

c) Proportionate mortality rate

d) Crude death rate ×

e) Cause specific death rate ×

البسط

6- **Which of the following is the numerator of neonatal mortality rate?** < 28 day

a) Number of deaths less than 28 days of age

b) Number of total births

c) Number of deaths less than 1 year of age infant

d) Number of deaths from 28 days to 1 year of age Post neonatal

e) Number of still births

1 → 4 Child

**Training 7**

The underlying table show number of reported cases and death from GIT cancer in a given country where estimated number of population is 30,000,000 and total number of deaths was 400,000 in 2021.

| Site of cancer | No. of reported cases | No. of death |
|---|---|---|
| Esophagus | 5,000 | 3,500 |
| Stomach | 8,000 | 6,300 |
| Duodenum | 2,000 | 870 |
| Jejunum and ileum | 1,500 | 340 |
| Colon | 14,000 | 3,000 |
| Rectum | 9,000 | 5,400 |
| Total | 39,500 | 19,410 |

**Calculate the following:**

1. Cause specific mortality rate for GIT cancer. $\frac{\text{total death}}{\text{estamated}} = \frac{19,410}{30,000,000} \times 100,000$
2. Proportionate mortality rate for GIT cancer. $\frac{\text{total death}}{\text{all Causes}} = \frac{19,410}{400,000} \times 100$
3. Case fatality rate for stomach cancer. $\frac{\text{total death}}{\text{Case stomach}} = \frac{6,300}{8,000} \times 100$