

Faculty of Medicine  
Public Health Dept.  
17 August 2021  
The exam in pages

M.D. Degree in Public Health & Community  
Medicine Clinical epidemiology and Biostatistics  
Exam 1<sup>st</sup> semester  
Number of Questions:  
Time Allowed: 3 Hours      Total: Marks 90



**I-Biostatistics: (30 marks)**

MCQ (1.5 mark for the MCQs from 1 to 15)

- 1- **Two** of the following statements are **not true** about parametric tests:
  - a- They are suitable with interval and ratio scale variables
  - b- Perfect in use when sample size is less than 10
  - c- They have less statistical power than non parametric tests
  - d- They are used mainly when equal variances are assumed
  
- 2- **Which one of the following tests is suitable for application when we compare between two independent groups as regards a dependent ordinal scale variable?**
  - a- Student t test
  - b- Kruskal wallis test
  - c- Mann whitney test
  - d- Wlcoxon test
  
- 3- **Which of the following tests is suitable to find the direction and strength of relationship between two ratio scale variables ?**
  - a- Linear regression
  - b- Logistic binomial regression
  - c- Spearman correlation
  - d- Pearson correlation
  
- 4- **In a research, the researcher adopt the 5% as the level of significance, the calculated student t test of significance was more than the standard test value, then which of the following fits this finding?**
  - a. The calculated test value lies within the 95 confidence level
  - b. The calculated p value was more than 0.05
  - c. The calculated p value was less than 0.05
  - d. There was no statistical significance difference

5- The best test of significance to be applied in 2x2 contingency tables [for two independent categorical variables] ,when the expected count is less than 5 in 25% of the cells is:

- a. Chi-square test
- b. Fisher's exact test
- c. Mc Nemar's test
- d. Binomial test

6- Which of the following is the best parametric test of significance to compare the mean between two dependent ratio variables?

- a. Wilcoxon test
- b. Paired -t test
- c. Student t test
- d. Pearson correlation test

7- \_\_\_\_\_ are used when you want to visually examine the relationship between two

quantitative variables.

- a. Bar graphs
- b. Pie graphs
- c. Line graphs
- d. Scatterplots

8- The normal probability curve is symmetrical about the mean,  $\mu$ , i.e. the area to the right of the mean is the same as the area to the left of the mean. This means that the probability in each is equal to:

- a. 0
- b. 1
- c. 0.5
- d. 0.25

- 9- Which of the following is False about non-parametric data and its analysis?**
- Nominal and ordinal variables are considered non parametric variables
  - Student t test is the test of choice to compare the means in two independent groups
  - Mann Whitney test can be used to compare the medians in two independent groups
  - Skewed quantitative variables are non-parametric variables
- 10- For Choosing a statistical test of significance we need to ask three questions. Which of the following questions is NOT asked?**
- What type of data do you have?
  - How many samples (or groups) do you have?
  - What is the test supposed to do?
  - How the test can be applied?
- 11- Which of the following can be used for prediction of the outcome (mention two) ?**
- Student t test
  - Multiple linear Regression
  - ROC curve
  - Chi square tests
- 12- Which of the following tests is suitable to compare the mean of a dependent normally distributed variable between three dependent samples ?**
- Freidman test
  - One way Anova
  - Repeated measures Anova
  - Cochran's Q test
- 13- What is the best type of correlations to be used when we study the correlation between one continuous variable and one binary variable?**
- Pearson correlation
  - Spearman correlation
  - Kendall Tau correlation
  - Point serial correlation

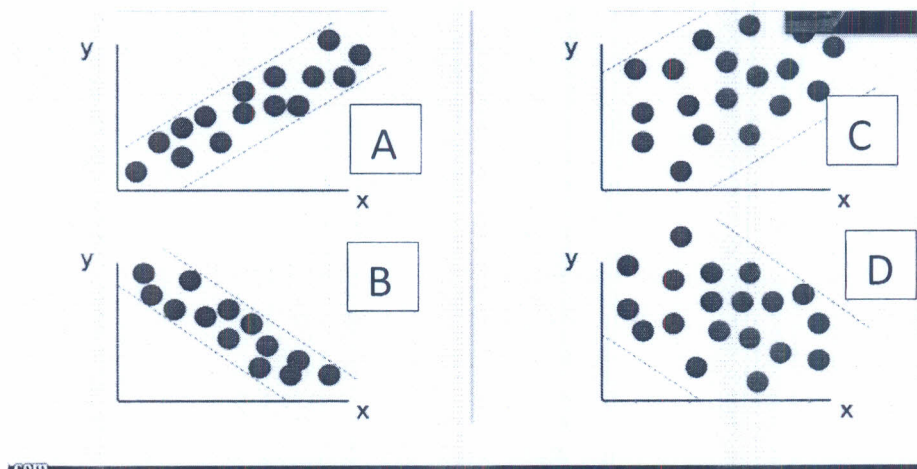
males having the disease in this study differs significantly from the proportion of males in a previous literature.

- a. One sample t test
- b. One sample median test
- c. Binomial test
- d. Fisher's exact test

**15- Which one of the following assumptions is NOT related to Mann-U-Whitney test?**

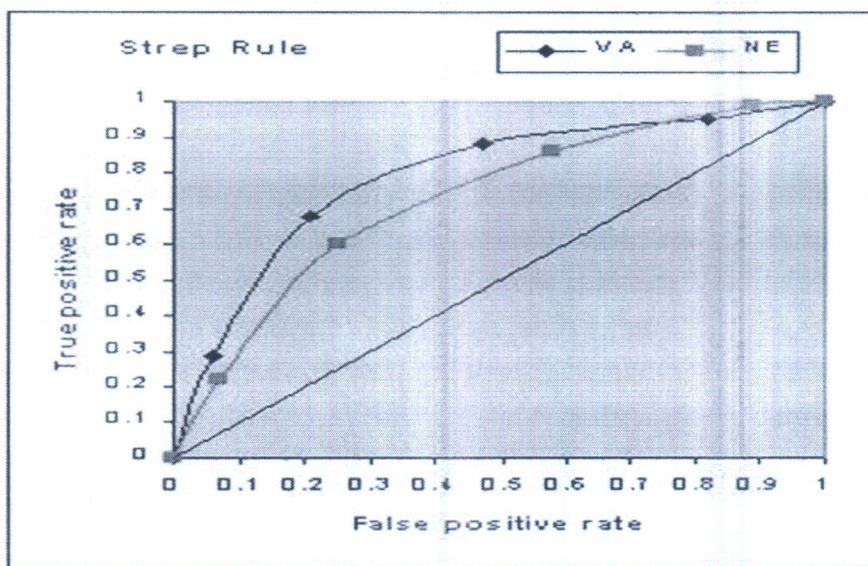
- a- Dependence of observations
- b- Median is the measure of central tendency
- c- The data is not normally distributed
- d- Can be used with ordinal variables

**16- Comment on these two scatter plots as regards the direction and the strength (2 marks)**



17- Comment on the ROC curve below: The graphs at below come from a study of how clinical findings predict strep sore throat. In two different regions. The area under the curve for one of them was 0.78 and the other was 0.73.

- a- Comment on these areas. (1.5 marks)
- b- Deduce the best cut off points for sensitivity (true positive rate) and false positive rate in both of the two curves (the upper curve and the lower curve) (2 marks)



18- In the table below, calculate the positive and negative likelihood of the screening test ( Using the SNAP II score to predict neonatal mortality) (2 marks)

SNAPII scores at the best cut off points detected by the ROC curve		Outcome		Total
		Died N=126	Discharge d N=374	
SNAPII at cut off 9.5	> 9.5 (+ve test)	106	118	224
	≤ 9.5(-ve test)	20	256	276

**II-Clinical epidemiology:**

**Q1-After a survey which was conducted on two groups of male individuals during the period 1991-2000, find out if there was a difference in mortality of those claimed themselves diabetic compared to the healthy non-diabetic individuals showing the following results: (15)**

Age strata of male individuals (years)	Deaths by age for male individuals with diabetes and non-diabetic					
	Diabetic individual		Non-diabetic individuals		Standard population of 1994	
	Population	Deaths	Population	Deaths	Population	Deaths
25-<40	451	10	32241	135	30500	847
40-<55	480	40	26541	126	28114	798
55-<65	1222	60	28400	605	18511	997
65-75	484	157	18111	1077	73000	1014

**Calculate the following with interpretation of the results:**

a-the crude death rates

b-the standardized death rates by two methods of standardization

c-Standardized mortality ratio

**Q2: Compare between the following rates, giving the epidemiological importance of each rate: (5 mark each total 20)**

a-Proportional mortality ratio, Proportional death rate, cause specific death rate and case fatality rate

b-Point prevalence rate and period prevalence rate

c-Person-time incidence rate and cumulative incidence or incidence rate and attack rate

d-Relative risk (RR) and Attributable risk (AR) and population attributable risk (PAR)

**Q3: Put letter (T) for true sentences and letter (F) for false sentences: (5)**

a-Case-fatality rate is considered to measure the virulence of a disease and is related to duration so it is customarily used for short duration diseases such as peritonitis.	
b-Screening test is done on sick or ill individuals and the initiative is come from a patient	
c-Sampling bias refers to the tendency of a sample statistic to systemically over- or underestimate of a population parameter	
d-High risk screening is the application of a screening test to large unselected population and every one in the group is screened as mammography in women	
e-Sequential screening testing means after the first screening test is conducted those who are tested positive are brought back for second testing further reduce false positives	

**Q4: Choose suitable letter of group B to the appropriate answer in group A: (10)**

<b>Group A</b>		<b>Group B</b>
1-The ability of the test to estimate present performance and correlate performance on the test with a concurrent behavior		a- Criterion-related validity
2-The ability to correlate performance on the test with a behavior in future		b-Predictive validity
3-Validity which cannot be used in all circumstances especially in social sciences where some conditions do not have relevant criteria representing problem of its use		c-Content validity
4-The assessment of the extent to which a measuring instrument accurately measures a theoretical construct it is designed to measure		d-Concurrent validity
5- The extent to which the result of the study is applicable to other population		e- Construct validation





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**17 August 2021**

**First Semester**

**Dectorate Degree in Industrial Medicine and  
Occupational Health**

**Time Allowed: 3 hours**

**All questions should be answered**



**Give an account on:**

- 1-Climate changes, causes and health effects?
- 2-Emerging occupational and Environmental contaminant and exposures?
- 3-Types of Particulate matter and its related health effects?
- 4-Cumulative trauma disorder associated with use of hand tools and methods of prevention?
- 5-Heat Hyperpyrexia, definition, causes, management & prevention?

**Good Luck**