



KENYATTA UNIVERSITY
EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN MEDICAL
LABORATORY SCIENCES
HML 400 : FUNDAMENTALS OF EPIDEMIOLOGY

3RD TRIMESTER 2021/2022

TIME: 2 HOURS

INSTRUCTIONS:

Section A: Answer all questions (4 marks each)

1. State the purpose of the following
 - i. Descriptive Epidemiology (2 marks)
 - ii. Analytic Epidemiology (2 marks)
2. Differentiate between the following term/s
 - i. Endemic and epidemic (2 marks)
 - ii. Rate and Ratio (2 marks)
3. Briefly explain the scope of Epidemiology (4 marks)
4. In an epidemic among 1000 people in a certain county in Keni, 500 people were infected with Hepatitis A in 2013 and 250 people died as a result of this infection during the same time
 - i. Fatality Rate? (2 marks)
 - ii. Interpret the results you have computed in (i) above (2 marks)
5. Briefly explain any two types of biases in Epidemiology (4 marks)

Section B: Answer only ONE question (20 marks each)

Q6. Use this scenario to answer the questions below; The County head has asked you to evaluate a proposed premarital HIV antibody screening program. A new test kit (Enzyme-linked Immunosorbent Assay: EIA) was used to screen 20000 people who wish to get married in Manjano County. The information regarding the Kit indicated that the test kit was 90% sensitive and specificity of 95%. Assuming that the actual prevalence of HIV antibody among persons getting married is 0.4%.

- a. Construct well labelled two by two contingency table (6 marks)
- b. Calculate the predictive value positive (5 marks)
- c. The predictive value negative of the EIA (5 marks)
- d. Comment on the results (4 marks)

Q7. A prospective cohort study conducted among 2000 females adults for 5 years revealed that, ladies who exercised and had breast cancer were 50 and ladies who did not exercise and had breast cancer were 600. The total number of ladies who exercised were 1000. Given constant (K) is 1000

- I. Draw a two by two contingency table (6 marks)
- II. Calculate the incidence of exposed (3 marks)
- III. Calculate the incidence of non-exposed (3 marks)
- IV. Calculate the relative risk (6 marks)
- V. Comment on the results in iv above (2 marks)

Section C: Answer all questions in the answer booklet (1/2 mark each)

1. The following statement is true on factors increasing prevalence EXCEPT

- a. Longer duration of disease
- b. In-migration of patients
- c. Prolongation of life of patients without care
- d. High case fatality rate from disease

2. One of the following statement is correct

- a. Epidemic is a habitual presence of a disease within a given geographical area.
- b. The finding by John Snow showed the risk of cholera in London was related to the drinking of water supplied by a particular company
- c. A ratio is a proportion with time specification
- d. Endemic is an occurrence of cases of disease in excess of what would normally be expected in a defined community, geographical area or season

3. One important characteristic that distinguishes intervention studies from observation studies is

- a. observation studies allow you to directly calculate a relative risk

- b. observation studies allow nature to take its course
 - c. observation studies require less time to complete
 - d. it is easier to control for confounding in observation studies
4. One of the following statement is correct
- a. Prevalence only includes new cases.
 - b. Incidence = (prevalence)(average duration of disease)
 - c. If incidence increases, the prevalence of disease must also increase.
 - d. Prevalence only includes old cases.
5. Kamau want to assess if there is an association between cigarette smoking and Lung cancer. One of the following is the best study design to assess for this association.
- a. Case Series
 - b. Case study
 - c. Cross-Sectional study
 - d. Prospective cohort study
6. A sampling method that can be used with either simple random sampling or systemic sampling to ensure adequate representation of certain groups in the sample is called
- a. Stratified Sampling
 - b. Purposive Sampling
 - c. Convenience Sampling
 - d. Snowballing Sampling
7. A relative risk of 0.04 means that the exposure
- a. Risk of disease are equal for exposed and unexposed
 - b. increases disease risk
 - c. reduces disease risk
 - d. is a risk factor
8. An example of a longitudinal or prospective study is
- a. Ecological study
 - b. Cross-sectional study
 - c. Cohort study
 - d. Observational study
9. The following are advantages of a cohort study EXCEPT
- a. Cheap, easy and quick studies

- c. Can establish population-based incidence
 - d. Accurate relative risk (risk ratio) estimation
10. One of the following statements best describes the relationship between Prevalence and quantitative validity measures
- a. The rise in prevalence is accompanied by a rise in Positive Predictive value and decrease in Negative Predictive value.
 - b. The rise in prevalence is accompanied by a decrease in Positive Predictive Value and rise in Negative Predictive value.
 - c. Prevalence has no relationship between Positive and negative Predictive value outcome
 - d. Prevalence of a disease is ONLY associated with sensitivity and specificity
11. One of the following statements best describe sensitivity of a test.
- a. The ability of a test to detect the proportion of positives (Those with disease)
 - b. The ability of a test to detect the proportion of negatives (Those without the disease)
 - c. The ability of a test to correctly identify all individuals who have been screened and yet they do not have the disease
 - d. This is the ability of a test to identify only those non diseased individuals who actually have the disease
12. Recall bias occurs when:
- a. Researchers in a case control study ask more probing questions of cases than controls.
 - b. Researchers are not blinded and they recall which subjects were cases and which subjects were controls.
 - c. Subjects in one arm of a randomized controlled trial recall their treatment compliance better than subjects in the other arm of the randomized controlled trial.
 - d. Cases and controls in a case control study know their disease (outcome) status and deferentially report their exposure histories.
14. The following are uses of epidemiology EXCEPT
- a. To study the history of the populations, and rise and fall of diseases and changes in their character.

- c. Modelling methods allowing the researcher to take samples of data from the area of focus.
 - d. To Identify the etiology or cause of a disease and the relevant risk factors
15. One of the following is true about prevalence and incidence
- a. For both the denominator is population at risk
 - b. Prevalence is more useful for studies of causation
 - c. Prevalence expresses the risk of becoming ill
 - d. Incidence estimates the probability of the population being ill at the period of time being studied
16. One of the following epidemiologic study designs is best suited for assessing a possible association between rare outcome and multiple exposure
- a. Case Series
 - b. Prospective Cohort Study
 - c. Case Control Study
 - d. Cross-Sectional Study
17. One of the following best describes case fatality rate.
- a. It is a measurement of the burden of illness.
 - b. It is possible for a disease to have a low case fatality rate if patients with the disease die quickly after getting the disease.
 - c. It is a measurement of disease at a particular point in time.
 - d. It is possible for a disease to have a high case fatality rate but a low mortality rate.
18. One of the following statements is true
- a. Descriptive epidemiology examines the distribution of a disease in terms of time, place, and person
 - b. Analytic studies include case series and case reports
 - c. Ecologic studies include cohort, case-control
 - d. Descriptive studies cannot examine patterns of diseases

disease. One of the following is a likely outcome

- A. Prevalence will increase
- B. Prevalence will decrease
- C. Incidence will increase
- D. Incidence will decrease

20. The following are descriptive epidemiological studies EXCEPT

~~Individuals~~

- a. Case reports
- b. Case control
- c. Ecological studies
- d. Cross-sectional surveys