"Investing in Africa's future"

COLLEGE OF HEALTH AGRICULTURE & NATURAL SCIENCE (CHANS)

NSPH 540: ADVANCED EPIDEMIOLOGY

END OF FIRST SEMESTER FINAL EXAMINATIONS

November 2021

LECTURER: DR C. MBUBA

DURATION: 5 HRS

INSTRUCTIONS

Answer **any one** question

All questions carry equal marks (100)

Use: Times New Roman, Font size 12, Line space: 2.0.

Submit answers in Word Format

Question 1

1) A research firm has recruited trainees to assist in conducting quantitative studies. You have been approached to train them on sampling methods. Discuss the various methods they can consider (20 Marks)
2) A researcher conducted a prospective cohort study to examine the effects of prenatal lead exposure on infant growth rates. The relative risk was 2.1 with a P- value of 0.03. Given that the observed association is valid (not due to chance, bias, or confounding), the researcher would like to find out whether it is causal. Describe the criteria the researcher will use to ascertain causal association (20 Marks)
3) Describe the epidemiological triad and use it to explain how diseases are transmitted (20 Marks)
4) Giving examples, discuss types of experimental studies (20 Marks)
5) Giving examples, explain ratio, proportion and rate (10 Marks)
6) A population of 10,000 (males and females) ages 50-70 were screened for possible colon and rectal cancer using heme occult blood kits. From previous studies, you know that 3% of this population has cancerous or pre-cancerous lesions. The sensitivity of the kit is 85% and the specificity is 82%.
    a) Construct a 2x2 table (2 Marks)
    b) Calculate the Positive Predictive Value (2 Marks)
7) The same screening method, with same sensitivity (85%) and specificity (82%) was repeated, but now examining a population of 10,000 with a prevalence of 8% instead of 3%
    a) Construct a 2x2 table (2 Marks)
    b) Calculate the Positive Predictive Value (2 Marks)
    c) Interpret the change in the Positive Predictive Value (2 Marks)

Question 2

1) Giving examples explain bias, confounding and effect modification. Further explain how to control for confounding (20 Marks)
2) You are an epidemiologist in the Ministry of Health and Child Care who has observed a fluctuation in prevalence of hypertension in Harare over the last five years. Describe some of the factors that could be influencing the prevalence of hypertension (20 Marks)
3) What are some of the data sources you will refer to in order to ascertain morbidity & mortality related to hypertension? (10 Marks)
4) Giving two advantages and two disadvantages, discuss three types of descriptive studies (20 Marks)
5) Describe the Fundamentals of Screening Strategies (10 Marks)
6) Giving examples, explain relative risk, odds ratio and attack rate (10 Marks)
7) Explain efficacy and effectiveness as applied in randomized clinical trials (5 Marks)
8) A study compared the lifestyle characteristics of 1123 men who had bladder cancer with those of 1983 men who did not have bladder cancer. Among the cancer cases, 706 men were current or former smokers, while 814 of the men without bladder cancer were current or former smokers.
    a) What kind of study is this? (1 Mark)
    b) Construct a 2X 2 table for these data (2 Marks)
    c) Calculate a measure of association between cigarette smoking and bladder cancer, and state what this means (2 Marks)

Question 3

1) Giving two advantages and two disadvantages, discuss three types of analytical studies (20 Marks)
2) Giving examples, describe the three levels of disease prevention (10 Marks)
3) Explain blinding and its role in randomized clinical trials (10 Marks)
4) Differentiate between clinical medicine and epidemiology and state uses of epidemiology (20 Marks)
5) Define non-probability sampling and discuss types of non-probability sampling (20 Marks)
6) Describe the Natural History of Disease. Use Cancer as your disease of reference (15 Marks)
7) A study was conducted to assess the association between benzene exposure and leukemia. The investigators selected 2000 workers who were occupationally exposed to benzene and 5000 workers who had no occupational benzene exposure, and followed them all for 10 years. At the end of the study period, 42 cases of leukemia had occurred among the benzene exposed workers and 18 cases had occurred among the non-exposed workers
    a) What kind of study is this? (1 Mark)
    b) Construct a 2x2 table for these data (2 Marks)
    c) Calculate the appropriate measure of association between benzene exposure and leukemia. Explain what this number means (2 Marks)