"Investing in Africa's future"

COLLEGE OF HEALTH AGRICULTURE & NATURAL SCIENCE (CHANS)

DEPARTMENT OF PUBLIC HEALTH AND NURSING (DPHN)

NSPH 540: ADVANCED EPIDEMIOLOGY (MPH)

FIRST SEMESTER FINAL EXAMINATIONS

AUG-DEC 2023

LECTURER: DR N. CHIKONZO

DURATION: 3 HRS

INSTRUCTIONS

Answer **ALL** Questions in **Section A** and **ANY 3** questions from **Section B**

The mark allocation for each question is indicated at the end of the question

Credit will be given for logical, systematic and neat presentations.

SECTION A

Question 1a.

Elaborate on the following:

    i.   Types and examples of Study designs   [5 marks]

    ii.   Hierarchy of evidence   [5 marks]

    iii.   Causality   [5 marks]

    iv.   Ecological Fallacy   [5 marks]

Question 1b.

The association between heavy alcohol consumption and the risk of oral cancer was investigated in a case–control study with 475 cases and 400 controls. Of the cases 350 had heavy alcohol consumption and 200 of the controls had heavy alcohol consumption.

    i.   Calculate and interpret the crude odds ratio based on these data [5marks]

    ii.   Sex was considered a potential confounder and/or effect measure modifier in this study. The data were stratified into males and females to assess these issues. Calculate the stratum-specific odds ratios among males and females using the following data [5 marks]

Heavy alcohol consumption	Males		Females	
	Cases	Controls	Cases	Controls
Yes	300	150	50	50
No	50	50	75	150

    iii. Is sex a confounder in this study and what will you do?   [2 marks]

    iv. Is sex an effect measure modifier in this study and what will you do [3 marks]

    v. Briefly justify your answers to parts C and D   [5 marks]

Question 2

A study is conducted to investigate the association between air pollution and mortality. The study uses data from a large city over a period of 10 years. The researchers measured air pollution levels at different locations in the city and then linked the data to death records.

a. What is the study design and why?   (5 marks)

b. Identify and explain at least 3 potential biases that could affect the study?   (10 marks)

c. How can these biases be minimized?   (5 marks)

Question 3

    a. Explain the concept of a causal inference in epidemiology (5 marks).
    b. Describe the Bradford Hill criteria for causation (10 marks)
    c. Give an example of how these criteria can be applied to establish a causal relationship between an exposure and an outcome (5 marks).

Question 4

ai) Define 'effect modification' and explain how these can influence the results of epidemiologic studies (4 marks)

ii) Describe methods to identify and control for effect modification in study design and analysis (6 marks)

bi) Define 'confounding' and explain how these can influence the results of epidemiologic studies (4 marks)

ii) Describe methods to identify and control for confounding in study design and analysis (6 marks)

Question 5

    a) Explain the steps involved in planning and implementing a cohort study (10 marks)
    b) Discuss sources of bias in cohort studies and strategies to minimize them (10 marks)

Question 6

    a.)
    b.)
    c.) Describe statistical considerations and methods for analyzing cohort study data (10 marks)

d.) Provide an example of a longitudinal cohort study that has advanced understanding of chronic disease epidemiology (10 marks)

End of Paper