



Technical University of Mombasa

Faculty of Applied and Health Sciences

DEPARTMENT OF PURE AND APPLIED SCIENCES
UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF
SCIENCE IN COMMUNITY HEALTH
BSCH 13J

APH 4206 : PRINCIPLES OF EPIDEMIOLOGY

SUPPLEMENTARY/SPECIAL : EXAMINATION

MARCH 2014 SERIES

2 HOURS

Instructions to candidates:

This paper consists of **FIVE** questions

Answer question **ONE** (compulsory) and any other **TWO** questions

QUESTION ONE

- a) Define the following terms :-
- (i) Demographic Transition (2 marks)
 - (ii) Epidemiologic Transition (2 marks)
- b) Explain the following in relation to disorders:
- (i) Disappearing disorders (1 mark)
 - (ii) Residual disorders (1 mark)
 - (iii) Persisting disorders (1 mark)
 - (iv) Epidemic disorders (1 mark)
- c) Briefly explain host characteristics that may be associated with increased risk of human

disease

(5 marks)

- d) The following data regarding alcohol drinking status among persons in Kilifi country were reported for 2012:

| | Number in Thousands | |
|--------|---------------------------------------|---|
| | All persons 18 years of age and older | Current regular alcohol beverage drinkers |
| Male | 104,919 | 59,300 |
| Female | 112,855 | 44,373 |

- a) State the sex ratio of male to female regular alcoholic beverage drinkers **(2 marks)**
- b) What proportion (percent) of regular alcoholic drinkers are women **(2 marks)**
- c) What is the prevalence per 1,00 of regular alcoholic beverage drinking among:-
- (i) Men only **(1 mark)**
 - (ii) Women only **(1 mark)**
 - (iii) The total population aged 18 and older **(1 mark)**
- d) State the importance of herd immunity to the public health administrator **(2 marks)**
- e) (i) Define confounding as used in epidemiology **(2 marks)**
(ii) State three criteria that qualify a factor as a confounder **(3 marks)**
- f) State three applications of epidemiology **(3 marks)**

QUESTION TWO

- a) Discuss the major steps in an investigation of a food-borne outbreak **(10 marks)**
- b) Explain why subclinical cases have always posed a problem in investigating the etiology of both infectious and non-infectious disease **(6 marks)**
- c) Explain four techniques used in medical research to reduce information bias **(4 marks)**

QUESTION THREE

Age-related maculopathy is a leading cause of blindness among people 65 and older in Kenya, and is estimated to affect between 16 and 26% of people in this age group. In a recent study by Ochieng, residents aged 43 to 86 years in Eldoret town, Uasin Gishu county were asked to participate in a study to determine whether cigarette smoking was related to

age-related maculopathy. At a baseline examination, participants were asked to report lifetime smoking habits. After 5 years, participants had an examination to determine whether they had developed age-related maculopathy. The following table presents the number of cases of age-related maculopathy measured at the follow-up examination among the 1232 male participants aged 43-86 who did not have age-related maculopathy (ARM) at the baseline examination :

| <i>Smoking status</i> | <i>N</i> | <i>Cases of ARM</i> |
|-----------------------|----------|---------------------|
| Never smokers | 368 | 26 |
| Ever smokers | 864 | 79 |

- Which of the following best describes the research design used in this study? **(3 marks)**
- Create a 2 x 3 table where one axis is smoking status and the other is age-related maculopathy status. **(5 marks)**
- Calculate the 5-years cumulative incidence of age-related maculopathy in ever smokers and in never smokers. Show your work. **(4 marks)**
- Calculate the cumulative incidence ratio comparing the incidence of age-related maculopathy in ever smokers with that in never smokers. Show your worker. **(4 marks)**
- Assuming causality, what is the proportion of cases of age-related maculopathy that could have been prevented in the population of males aged 43-86 in Eldoret if the smokers had never smoked? Show your work. **(4 marks)**

QUESTION FOUR

- An epidemiologist in Mombasa County Government health department investigated an outbreak of gastro intestinal illnesses thought to be associated with student cafeteria at Technical University of Mombasa. At the middle of the middle of the night, students visited the University's health unit complaining of nausea, diarrhea, fever, vomiting and cramps. The health department's investigation related that 24 students had eaten in the cafeteria immediately before the outbreak. The times between eating in the foods, and tabulations of illness are presented in the table below:

| Food items served | # of persons who ate | | | | # of persons who did not eat | | | |
|-----------------------------|----------------------|---------|-------|-------------|------------------------------|---------|-------|-------------|
| | ill | Not ill | Total | Attach rate | ill | Not ill | Total | Attack rate |
| Beef, rare | 17 | 6 | 23 | | 0 | 1 | 1 | |
| Three-bean salad | 10 | 3 | 13 | | 7 | 4 | 11 | |
| Beef, specified well cooked | 3 | 6 | 9 | | 5 | 10 | 15 | |
| Total Salad | 12 | 6 | 18 | | 4 | 2 | 6 | |
| Tuna salad | 13 | 1 | 14 | | 3 | 7 | 10 | |
| Macaroni salad | 11 | 5 | 16 | | 4 | 2 | 6 | |
| Cold cuts and cheese plate | 10 | 6 | 16 | | 5 | 3 | 8 | |
| Rolls and butter | 13 | 4 | 17 | | 4 | 3 | 7 | |
| | | | | | | | | |

- i) Calculate the attack rates for all the foods in the table **(8 marks)**
- ii) What food or foods would you suspect caused the problem? **(2 marks)**
- iii) Which agent(s) do you think was (were) responsible? **(4 marks)**
- b) Name three microbial agents that must be present for infectious diseases to occur. For each microbial agent, named, give two examples of diseases they cause. **(6 marks)**

QUESTION FIVE

- a) Explain the purposes of blinding and randomization in clinical trials **(4 marks)**
- b) How is case-control study different from a retrospective cohort study? **(4 marks)**
- c) Discuss three advantages and three disadvantages of case-control studies. **(6 marks)**
- d) Explain the major difference between randomized clinical trials and community trials **(3 marks)**
- e) Explain three advantages of surveillance **(3 marks)**