



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF ENVIRONMENT & HEALTH SCIENCES

UNIVERSITY EXAMINATION FOR:

MASTER OF PUBLIC HEALTH

APH 5114: EPIDEMIOLOGY IN PRACTICE

SPECIAL/ SUPPLEMENTARY EXAMINATIONS

SERIES: SEPTEMBER 2018

TIME: 3HOURS

DATE: September 2018

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **four** pages.

Answer question ONE (COMPULSORY) and any other three questions

Do not write on the question paper.

Question ONE (30 MARKS)

- a) Comment on the utility of relative and absolute measures of effect in assessing the benefits a community will get from a prevention program (6 marks)
- b) There are two standard treatments for autistic children who display a specific set of characteristics. One treatment is a cognitive-behavioral intervention, and the other is a dietary and biomedical intervention. Both treatments have equally strong clinical evidence supporting their efficacy. A researcher proposes a comparison of the two interventions to determine which is preferable. The children will be randomized to one of two groups: half of the children will receive the cognitive behavioral intervention and the other half of the children will receive the dietary and biomedical intervention. Is this study in equipoise? (5 marks)
- c) An experimental screening test for hepatitis B has a sensitivity of 82% and a specificity of 93%. The prevalence of hepatitis B in the population to be screened is estimated to be 3%.
 - i. What is the probability that an individual with a positive test result does not have hepatitis B? (4 marks)
 - ii. Using this test, what proportion of a population free of hepatitis B would falsely test positive? (4 marks)

- d) You are investigating a new drug for malaria among children in a disease endemic community. As per the protocol, the parents are expected to consent for their children to participate in the research. How would you proceed with consenting of parents who cannot read or write? (5 marks)
- e) Some types of research involve a significant commitment from research participants in terms of time or effort, and investigators may wish to provide compensation. During the informed consent process, investigators should explain to potential research participants that compensation **is not** a benefit of the research and explain situations in which compensation may be provided. Describe the information that investigators should provide to potential research participants during consenting process (6 marks)

Question TWO (30 MARKS)

- a) A child has a rare genetic disorder. No treatment is currently available. You have designed a longitudinal study that will examine the progression of the disorder. The study will involve standard physical and psychological examinations, including drawing 10ml of blood 4 times per year.

After enrolment, at which time the parents provided permission for the child to participate in the study and the child provided assent, he panics and screams that he doesn't want to participate and wants to go home when he sees the nurse holding a needle for the blood draw. The parents are present and want the child to participate. What ethical issues should the investigator consider when making the decision on how to proceed? (20 marks)

- b) Determine which of the items in Column Y (a-m) best describes the situations listed in X (1-10). Insert your answers in the spaces provided below the table (10 marks).

| X | | Y | |
|---|--|---|------------------------------|
| 1 | The risks or benefits of a research are equally distributed in the study population. | a | Voluntary participation |
| 2 | Identifying information will not be made available to anyone who is not directly involved in the study | b | Diminished autonomy |
| 3 | May exercise all of the IRB's authorities with one important exception; that is, may not disapprove research | c | Elements of informed consent |
| 4 | Especially relevant where researchers had previously relied on 'captive audiences' for their subjects | d | Nonmaleficence |
| 5 | solidarity approach and the individual right approach | e | Confidentiality |
| 6 | Competence, Disclosure of Information, Comprehension, Confidentiality, Voluntariness | f | Exemption status |
| 7 | Sensitivity of the information being collected | g | Views on achieving equity |

| | | | |
|----|-----------------------------------|---|---|
| 8 | Person contributing information | h | An issue to be considered in regards to privacy |
| 9 | Children, Prisoners, Mentally ill | i | Justice |
| 10 | Do no harm, | k | Expedited review |
| | | l | Study participant |
| | | m | Data |

- INSERT YOUR ANSWERS BELOW:

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|----|
| X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Y | | | | | | | | | | |

Question THREE (30 MARKS)

If we are interested in the association between drinking coffee and incidence of heart disease, which of the following factors are likely to be confounders and why:

- i. age and sex
- ii. smoking
- iii. physical activity
- iv. Fruit and vegetable intake.

Question FOUR (30 MARKS)

The association between decreased duration of sleep and incidence of coronary heart disease (CHD) was studied among women enrolled in the Nurses' Health Study. Among women who reported sleeping 7 or 8 hours per night there were 541 incident cases of CHD during 451,393 person-years of follow-up. Among those who slept for 6 hours per night there were 267 cases in 175,629 person-years, and among those sleeping 5 or fewer hours per night there were 67 cases during 30,115 person-years of follow-up.

- a) Calculate the incidence rate of CHD among
 - (i) Women who reported sleeping 7–8 hours per night,
 - (ii) Women who reported sleeping for 6 hours per night,
 - (iii) Women who slept 5 or less hours per night and
 - (iv) All women.
- b) How strong is the association between sleep duration and the incidence of CHD?
- c) What percentage of CHD cases could theoretically be prevented if all women slept for 7–8 hours per night?

Question FIVE (30 MARKS)

Give an account of undue influence in the context of obtaining informed consent for medical research.

Question SIX**(30 MARKS)**

The table below shows some data from a study of injuries involving moped riders in Kenya. The authors obtained information from the Kenyan Registry of Traffic Crashes regarding 187,353 moped riders injured in traffic accidents between 2007 and 2018. They then compared the group with head injuries (cases) with those with other types of injury (controls). (30 marks)

Results of a study of head injury and helmet use

| | Driver | | Passenger | | Total | |
|------------------|---------------|----------------|--------------|---------------|---------------|----------------|
| | Head injury | Other injury | Head injury | Other injury | Head injury | Other injury |
| No helmet | 17,869 | 51,900 | 3,052 | 12,522 | 20,921 | 64,422 |
| Helmet | 7,342 | 86,212 | 485 | 7,971 | 7,827 | 94,183 |
| Total | 25,211 | 138,112 | 3,537 | 20,493 | 28,748 | 158,605 |

- What is the crude odds ratio for the association between not wearing a helmet (exposed) and head injury?
- What is the odds ratio for the association between not wearing a helmet and head injury among (i) moped drivers and (ii) moped passengers?
- Was the crude association between not wearing a helmet and head injury confounded by position on the moped?
- Does the position of the rider (driver or passenger) on the moped affect their chances of sustaining a head injury? (Hint – first calculate the crude odds ratio for the association between moped position and head injury and then consider whether this could be confounded by helmet use.)