



# **MACHAKOS UNIVERSITY**

**University Examinations 2019/2020 Academic year**

**SCHOOL OF HEALTH SCIENCES**

**DEPARTMENT OF PUBLIC AND COMMUNITY HEALTH**

**FOURTH YEAR SPECIAL /SUPPLEMENTARY EXAMINATION FOR**

**BACHELOR OF SCIENCE IN POPULATION HEALTH.**

**HEH 400. APPLIED EPIDEMIOLOGY**

**DATE: 18/01/2021**

**TIME: 2.00-4.00 PM**

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## **INSTRUCTIONS**

This paper consists of two sections A and B

### **SECTION A**

- This section has one question
- The question is compulsory
- The question is 30 marks

### **SECTION A: COMPULSORY**

#### **QUESTION ONE (30 MARKS)**

- a) Distinguish between observational and experimental epidemiological study designs  
(3 marks)
- b) Define the following terms:-
- i. Epidemiology
  - ii. Ethical principles
  - iii. Screening (3 marks)
- c) You are engaged in a surveillance program of malaria occurrence in County X. Giving reasons identify the key stakeholders you would share your findings with. (3 marks)

- d) With examples, give instances when you use epidemiology knowledge in making personal decisions. (3 marks)
- e) In an outbreak of tuberculosis among prison inmates in Naivasha in 2015, 28 of 157 inmates residing in dormitory A developed tuberculosis, compared with 4 of 137 inmates residing in dormitory B, Using a two-by-two table. Calculate the risk ratio. (3 marks)
- f) Explain confounding and its occurrence in epidemiology (3 marks)
- g) Systemic errors contribute to bias in epidemiology explain (3 marks)
- h) Briefly discuss immunization as a disease control strategy (3 marks)
- i) Identify and explain at least 3 types of disease screening test (3 marks)
- j) Wedding party attendees, a day after the occasion complained of vomiting and diarrhea, after about 30 days most of the attendees were diagnosed with typhoid. Determine the epidemic patterns presented in this scenario. (3 marks)

**SECTION B:**

- This section has four (4) questions
- Answer any two (2) questions
- Each question is 20 marks

**QUESTION TWO (20 MARKS)**

- a) You are engaged in designing a study that will involve administration of a vaccine in the prevention of COVID-19 virus among children. Using your knowledge in epidemiology identify and discuss the most appropriate epidemiological studies that would be used. (10 marks)
- b) Explain ways in which confounding can be addressed in epidemiological studies (10 marks)

**QUESTION THREE (20 MARKS)**

- a) Discuss the limitations of cohort studies (10 marks)
- b) An epidemiologist has been hired by Migori County, while going through the County health reports he notices that there has been significant children mortality due to diarrhea. Discuss

the possible reasons for this and programs that he can put in place to mitigate the situation.  
(10 marks)

**QUESTION FOUR (20 MARKS)**

- a) In a case-control study investigating the risk of smoking and lung cancer onset the cases had higher prevalence of smoking and lower intake of fruits and vegetables than the controls. It was difficult to make a conclusion on true effect of smoking and cancer risk independent of fruit and vegetable consumption patterns. Discuss the criteria that can be used in determining causal relationship in this scenario.  
(10 marks)
- b) Discuss the characteristics of a well conducted public health surveillance (10 marks)

**QUESTION FIVE (20 MARKS)**

- a) Explain key ethical and professional issues in epidemiology (10 marks)
- b) Measures of association are important in public health. Describe the measure of association you would use to emphasize to the local government the impact of fluoride intake and dental carries development in children. (10 marks)