



**PROGRAM** : MASTER OF PUBLIC HEALTH

**SUBJECT** : **Principle and Practice of Environmental Health**

**CODE** : **PPE01X1**

**DATE** : FINAL EXAMINATION  
02 JUNE 2017

**DURATION** : 3 HOURS

**WEIGHT** : 50: 50

**TOTAL MARKS** : 150

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**MODERATOR** : MRS CHARLOTTE MOKOATLE

**NUMBER OF PAGES** : 07

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**INSTRUCTIONS TO CANDIDATES:**

1. Answer all questions.
2. Read your questions carefully, you will be penalized if your answers are not properly structured.
3. You can start with any question, but do not divide sub-questions of the same question.
4. Please write neatly.

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**GOOD LUCK**

**QUESTION 1**

- 1.1 Describe ten essentials of public health services (10)
- 1.2 Name four different stakeholders and their roles in public health (8)
- 1.3 State the difference between the acute and chronic exposure (2)

**[20 Marks]**

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**QUESTION 2**

- 2.1 Compare the current existing national health system and the new piloted national health insurance system. Furthermore, what would be the benefits of implementing the new proposed system? (20)

**[20 Marks]**

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**QUESTION 3**

Choose the most correct answer:

- 3.1 An investigator was interested in studying the risk of developing cancer in people exposed to radon at a chemical plant in the 1990s. In 2015 she identified men and women working in different parts of that plant, in the administration, and in the actual plant and assigned them to exposed and unexposed group. This type of study is an example of: (1)
  - A. An ecologic study.
  - B. A case-control study.
  - C. A cross-sectional study.
  - D. A prospective cohort study.
  - E. A retrospective cohort study
- 3.2 A prospective cohort study demands: (1)
  - A. A cohort with high incidence of the disease in question.
  - B. Subjects whose exposure to a suspected risk factor is comparable to that of the control group at the onset of the study.
  - C. Subjects known at the onset to have the disease in question.
  - D. Subjects known at the onset to be disease-free.
  - E. Comparison group of equal sizes.

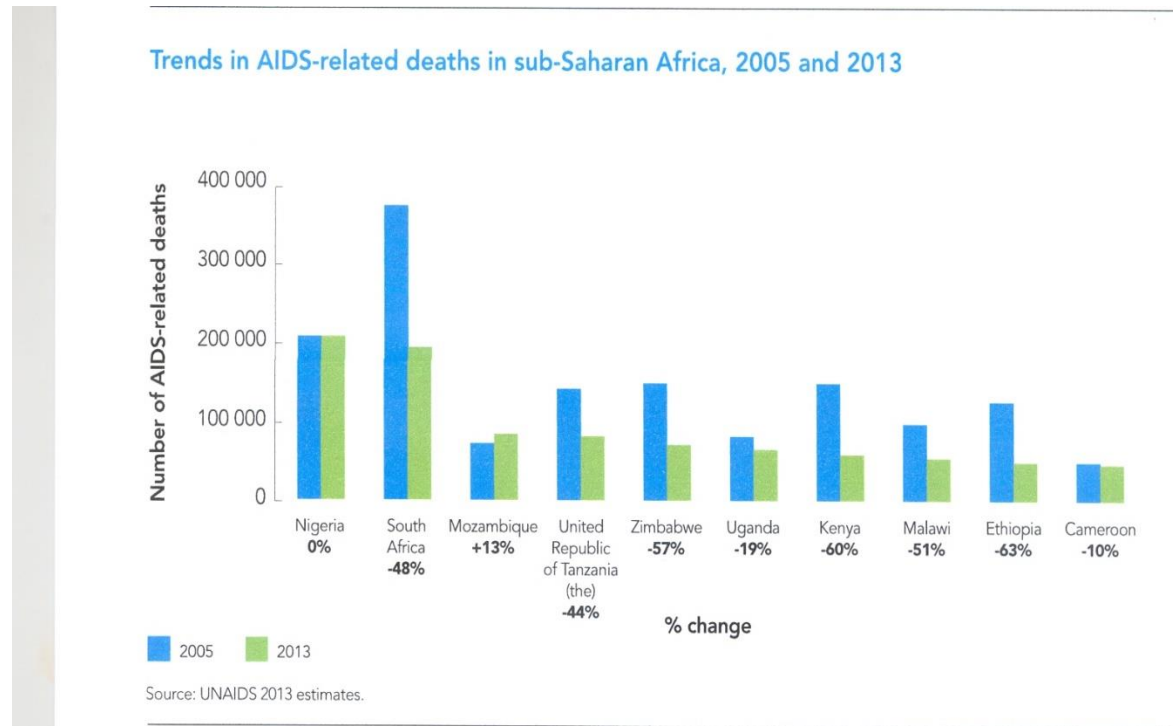
- 3.3 Researchers identify 10 patients with severe inflammatory bowel disease (IBD). Each patient is given experimental medicine X. The researchers follow the 10 patients for six months and report that 80% of the patients had an improvement with their IBD symptoms while 20% of the patients had no improvement with their IBD symptoms. Select the correct statement: **(1)**
- A. This is a case series report.
  - B. This is a prospective cohort study.
  - C. The relative risk of having an improvement with IBD symptoms is 4.0.
  - D. Confounding is a possible explanation of the results.
  - E. The attributable risk of having an improvement in IBD symptoms over three months is 60%.
- 3.4 Which of the following statements explains the principal difference between an experimental study and a prospective cohort study? **(1)**
- A In an experimental study, subjects are followed forward in time from intervention to outcome.
  - B An experimental study requires larger sample sizes.
  - C In an experimental study, subjects are randomly allocated to the intervention of interest.
  - D A control group is required in an experimental study.
  - E Participants in an experimental study are randomly selected from the target population.
- 3.5 An occupational safety officer knows that the RR of a non-Hodgkin's lymphomas following exposure to a particular industrial chemical is 12.5. What can he conclude from this information? **(1)**
- A. A worker who is exposed to large quantities of the chemical in question has a very high probability of developing a non-Hodgkin's lymphoma.
  - B. Worker who is exposed to large quantities of the chemical is 12.5 times more likely to develop a non-Hodgkin's lymphoma than a worker who is not exposed to the chemical.
  - C. It is unlikely that the observed association between exposure to the chemical and non-Hodgkin's lymphomas is due to random chance.
  - D. The incidence of non-Hodgkin's lymphomas is very high among workers exposed to the chemical.
  - E. All of the above.

**[ 5 Marks]**

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**QUESTION 4**

4.1 Describe the graph below and explain (postulate) what could be going on, based on the presented information (5)



**[5 Marks]**

**QUESTION 5**

Two hundred children known to have been exposed to high levels of lead during the first 12 months of life were followed for 15 years; 80 developed an affective disorder. A similar group of 200 children who were not exposed to high lead levels during the first 12 months of life were also followed over the same time period. Ten of these children developed an affective disorder. The results are displayed in the 2x2 below:

Exposure	Affective disorder	No effective disorder	Totals
Exposed to high levels of lead	80	120	200
Not Exposed to high levels of lead	10	190	200
Totals	90	310	400

- 5.1 What is the incidence of affective disorder among the study participants? (2)
- 5.2 Cumulative incidence in the exposed. (2)
- 5.3 Cumulative incidence in the non-exposed. (2)
- 5.4 What is the RR of affective disorder for high levels of lead compared to no lead exposure? (2)
- 5.5 Interpret your findings. (2)

[10 Marks]

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### **QUESTION 6**

A case-control study looked at the association of alcohol use with the occurrence of coronary heart disease (CHD). There were 400 participants in the study (200 cases and 200 controls). Of the cases, 110 participants drank alcohol; of the controls, 60 participants drank alcohol.

	<b>CHD</b>	<b>No CHD</b>
<b>alcohol</b>	110	60
<b>No alcohol</b>	90	140
	200	200

- 6.1 Calculate the appropriate measure of association. (3)
- 6.2 Interpret the appropriate measure of association. (2)
- 6.3 What is the purpose of a control group in a case- control study. (2)
- 6.4 Which control group would use in your study? Explain why this is the best option (3)

[10 Marks]

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**QUESTION 7**

7.1 What is a confounder? (2)

7.2 Give a confounder for a relationship between exposure and outcome (1)

7.3 Mothers of infants born with birth defects (cases) may be more likely than mothers of normal infants (controls) to remember or even overestimate their use of over the counter medications during pregnancy.

7.3.1 What type of bias would result from this study and why, give the direction of the bias, under or overestimation (2)

7.4 In a small study of the relationship between physical activity and the risk of developing Type II diabetes, the researcher interviewed 100 Type II diabetic patients and 100 controls on the exercise habits and reported an odds ratio of 0.65 of this relationship.

7.4.1 Interpret this finding (2)

7.4.2 What are the advantages of randomization (2)

7.4.3 Why are we concerned about information/interviewer, bias? (2)

7.4.4 What do you understand reliability? (2)

7.4.5 How would reliability impact a study? (2)

7.4.6 Why are we interested in validity? (2)

7.4.7 What are the differences between internal and external validity? (2)

7.4.8 Why do we use a placebo in experimental studies? (2)

7.4.9 What do you understand by the intent to treat principle? (2)

7.4.10 What do you understand by ecologic fallacy? (2)

**[25 Marks]**

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**QUESTION 8**

*The United Nations (UN) announced seventeen Sustainable Development Goals (SDGs) to "end poverty, protect the planet, and ensure prosperity for all".*

8.1 Discuss the two most critical environmental and public health related SDGs, vital to the sustainable development of the Southern African Region. Substantiate your answers with relevant examples where applicable. (10)

**[10 Marks]**

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**QUESTION 9**

9.1 Discuss municipal health services as described in Section 32(1) of the Health Act, Act 61 of 2003 and explain how these services can ensure the health of residents within a municipal area. (20).

**[20 Marks]**

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**QUESTION 10**

10.1 Discuss the procedure that is followed to inspect and monitor the hazardous chemical substances at the district level.

**[15 Marks]**

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**QUESTION 11**

11.1 Name and explain five determinants of health.

**[10 Marks]**

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**TOTAL = 150 Marks**