

POSTGRADUATE INSTITUTE OF MEDICINE  
UNIVERSITY OF COLOMBO

MD (COMMUNITY MEDICINE/COMMUNITY DENTISTRY) PART I  
EXAMINATION – AUGUST 2014

Date :- 11<sup>th</sup> August 2014

Time :- 2.00 p.m. – 4.00 p.m.

PAPER I

Answer **all four** questions.

Answer each question in a separate book.

1. A young student reports that he has done a case-control study to assess the relationship between HIV infection at birth and behavioral problems among children 3 - 5 years of age. The following data are available:

Number of cases (defined as children 3-5 years of age with HIV infection at birth)	= 120
Number of controls (defined as children 3-5 years of age without HIV infection)	= 160
Number of children with behavioral problems	= 28
Number of children with HIV infection at birth and behavioral problems	= 12

- 1.1. Discuss the appropriateness of the terminology used to describe the study design. (40 marks)
- 1.2. Calculate a measure of association and state what it represents. (15 marks)
- 1.3. Write short notes on:
- 1.3.1. Nested case control study (15 marks)
  - 1.3.2. Receiver operating characteristic curve (15 marks)
  - 1.3.3. Neyman bias and its significance with an example (15 marks)

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2. Discuss briefly the relative merits of the following-
  - 2.1. Likert scales to measure attitudes with 4 point and 5 point response formats. (25 marks)
  - 2.2. Self-administered and interviewer administered questionnaires to collect information on sexual behaviour. (25 marks)
  - 2.3. Dichotomizing or not dichotomizing numeric outcome variables. (25 marks)
  - 2.4. Population approach and high risk approach for the prevention of non-communicable diseases. (25 marks)
3. A researcher wishes to test the hypothesis that lauric acid in coconut oil due to its antiviral effect on the HIV virus can be used in the treatment of patients with HIV/AIDS.
  - 3.1. Suggest the composition of a team to design and carry out this study, giving reasons. (20 marks)
  - 3.2. List and briefly describe the steps in the implementation of this study. (50 marks)
  - 3.3. List and briefly explain the measures of outcome in this study. (15 marks)
  - 3.4. Discuss the possible ethical issues arising from this study. (15 marks)
4.
  - 4.1. Define the following terms, highlighting how they affect economic decision making:
    - 4.1.1. Opportunity cost (15 marks)
    - 4.1.2. Induced demand (15 marks)
    - 4.1.3. Oligopoly (15 marks)
  - 4.2. List the main advantages and shortcomings of the current health financing system in Sri Lanka. (15 marks)
  - 4.3. Using hypothetical examples, explain how you would carry out the two (02) analyses below:
    - 4.3.1. Cost effectiveness analysis. (20 marks)
    - 4.3.2. Cost benefit analysis. (20 marks)

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EXAMINATION – AUGUST 2014

Date :- 12<sup>th</sup> August 2014

Time :- 9.00 a.m. – 11.00 a.m.

PAPER II

Answer **all four** questions.

Answer each question in a separate book.

1. A descriptive cross sectional study was conducted to determine the accuracy of prostate specific antigen (PSA) levels for diagnosing carcinoma of the prostate in suspected patients (who all had lower urinary tract symptoms). The diagnosis of cancer status was confirmed on histology.

Table 1: Prostate carcinoma status by levels of PSA

PSA level (ng/ml)	Prostate Carcinoma +ve	Prostate Carcinoma -ve
>6	97	3
4.1 – 6	118	30
2.1 – 4	13	51
<2	2	176
Total	230	260

- 1.1. In designing this study, explain how the study population should have been selected in a way that might introduce least bias. (15 marks)
- 1.2. Calculate the likelihood ratios and explain why the investigators had categorized into four (04) instead of two (02) PSA levels. (25 marks)
- 1.3. Pre-test probability of prostate carcinoma in a given setting is 20%. What is the probability of a man with lower urinary symptoms having prostate carcinoma if his PSA level is 7.8 ng/ml? (20 marks)
- 1.4. As a clinician would you recommend this test for diagnosing prostate carcinoma in patients presenting with lower urinary symptoms? Justify your answer. (20 marks)
- 1.5. As a policy maker what other factors would you consider in order to use this test in state hospitals? (20 marks)

- 2.
- 2.1. Describe the current system of primary health care services in the plantation sector in Sri Lanka. (25 marks)
  - 2.2. Briefly explain four (04) challenges to accessing primary care services in the plantation sector. (25 marks)
  - 2.3. Explain the principles of clinical ethics, giving an example for each principle. (50 marks)
- 3.
- 3.1. Describe briefly the usefulness of developing Results Framework for public health program management. (20 marks)
  - 3.2. On analyzing gender statistics of those attending screening programs for non-communicable diseases at primary level health institutions, it was found that the majority were females.  
Give likely reasons to explain the difference. (20 marks)
  - 3.3. The Provincial Director of Health Services has informed all Medical Officers of Health (MOOHs) in the province that male participation in screening for non communicable diseases at primary care level has to be improved. As the provincial Consultant Community Physician you have been asked to develop a plan to improve male participation.
    - 3.3.1. Outline steps that you would take to develop this plan for this province. (30 marks)
    - 3.3.2. Describe how you would implement the plan through MOOHs and public health teams. (30 marks)
- 4.
- 4.1. Describe the attributes of professionalism in programme managers in public health. (50 marks)
  - 4.2. The Provincial Director of Health Services in a province has requested you as the Consultant Community Physician to develop a program to accommodate new non medical graduates as Program Planning Officers (PPO) to be attached to MOH Offices from the year 2015.  
Describe the steps to effectively deploy the graduates at MOH Offices. (50 marks)

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MD (COMMUNITY MEDICINE/COMMUNITY DENTISTRY) PART I

EXAMINATION – AUGUST 2015

DATE: 10 August, 2015

Time: 2.00-4.00 pm

Answer **all four** questions

Answer **each question in a separate book.**

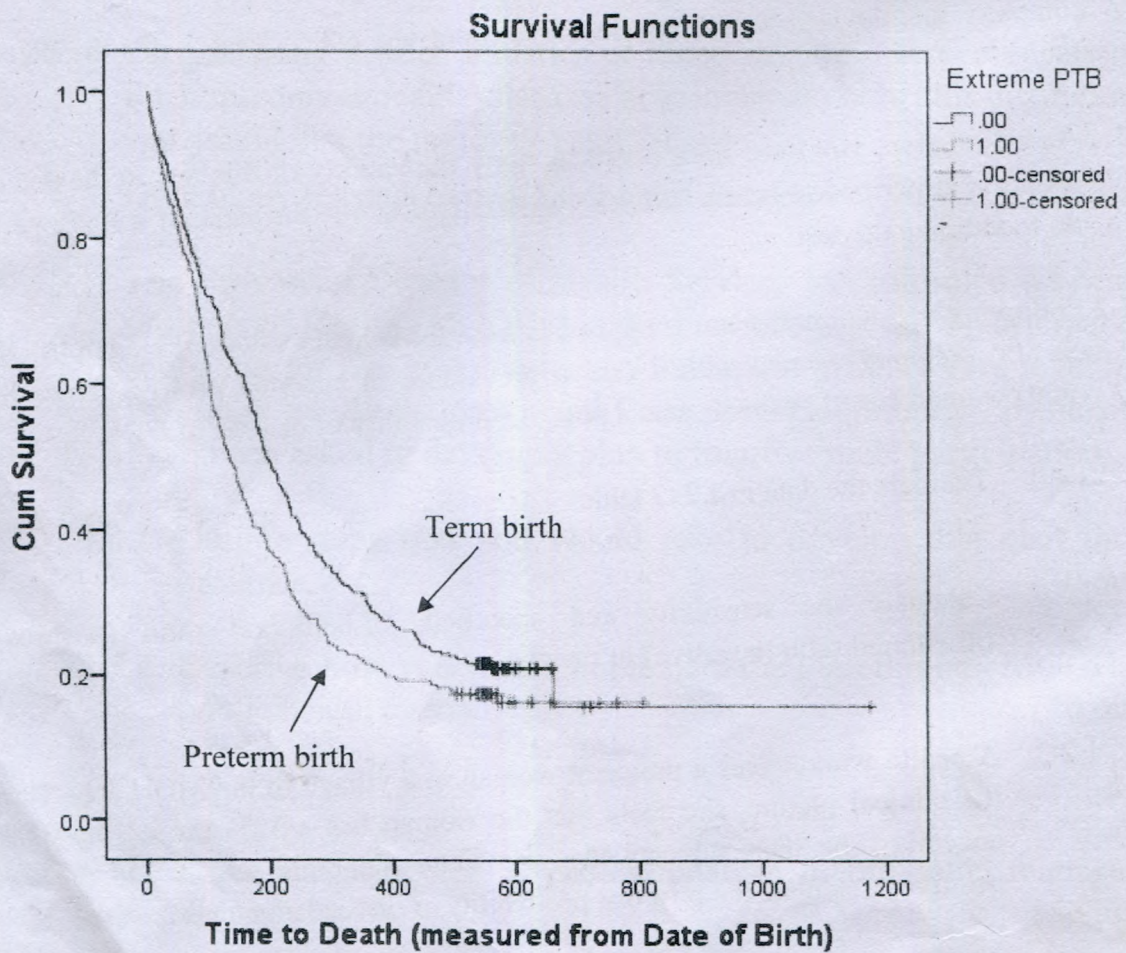
1. A company has devised a new non-invasive rapid test called Test X for the detection of anaemia.
  - 1.1 As a first step, you have been asked to study the validity of this test in the detection of anaemia at peripheral health institutions. Briefly describe the steps of a study you would do to validate the test. (30 marks)
  - 1.2 Following validation, the test is applied in a rural Medical Officer of Health (MOH) area on 500 pregnant women with a known prevalence of anaemia of 40%. Three hundred (300) women tested positive, with a post test probability of disease of 60%.
    - 1.2.1 Tabulate the data in a 2x2 table. (10 marks)
    - 1.2.2 Calculate the sensitivity and specificity, Likelihood ratio (positive) and Likelihood ratio (negative) of the test. (20 marks)
    - 1.2.3 A health worker sees a pregnant woman in a village in the MOH area. Based on the clinical picture, she feels that the woman has a 30% probability of having anaemia. She then subjects the woman to the rapid test X and the result is positive. Calculate the post test probability of disease given test positivity. (25 marks)
  - 1.3 List five (5) strategies to reduce the problem of iron-deficiency anaemia in a rural population. (15 marks)

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2. A study was conducted to determine the survival of extreme pre-term birth (PTB) babies. Six hundred and twenty eight babies were included. Survival analysis was performed. Results are presented in the following Tables 1 and 2 and Figure 1.

**Table 1 Comparison of survival time by duration of gestation**

	Median survival (days)	Chi-square value	P value	Hazard ratio	95% Confidence interval
Normal-term birth	190.000	6.80	0.009	1.30	1.10 – 1.50
Pre-term birth	131.000				



**Figure 1 Survival Functions**

**Table 2 Results of multiple Cox proportional regression analysis**

	Regression coefficient	Standard error	p value
Extreme PTB	0.229	0.089	0.01
Sepsis	0.311	0.106	0.003
Female	-0.217	0.100	0.03

- 2.1 Briefly describe the methodology of the above study. (15 marks)
- 2.2 State the reason for reporting median survival. (10 marks)
- 2.3 Name a statistical test used to compare the data presented in Table 1. (10 marks)
- 2.4 Describe Figure 1 presented above. (15 marks)
- 2.5 Calculate and interpret adjusted hazard ratio and 95% confidence interval for extreme PTB. (30 marks)
- 2.6 State the advantages of applying Cox proportional regression over logistic regression. (20 marks)
3. The Ministry of Health has expressed concern that there has been an unusual increase in the number of cases of HIV/AIDS among school children between 15-19 years in a province in Sri Lanka in the past two to three years.
- 3.1 Discuss how you would verify this statement. (30 marks)
- 3.2 Describe the research methods you would use to study the reasons /determinants for the occurrence of HIV infection among school children between 15-19 years. Justify your answer. (40 marks)
- 3.3 State briefly the strategies the Ministry of Health could use to address the problem of HIV infection among adolescent school children. (30 marks)

4.

4.1 Discuss the main economic challenges posed by demographic transition to the Sri Lankan health sector. (50 Marks)

4.2 A grant is given to a particular province for the control of non communicable diseases (NCDs).

Discuss how an economic decision should be made whether the grant should be spent on a screening programme for NCDs targeting the community or on the setting up of a highly specialized operating theatre for cardiac surgery. (50 Marks)



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EXAMINATION – AUGUST 2015

Paper - II

DATE: 11 August, 2015

Time: 9.00 to 11.00 a.m.

Answer all four questions

Answer each question in a separate book.

1. It has been noticed that alcohol abuse is a major problem faced by workers in the plantation sector in Sri Lanka. It has been decided to study this problem in detail in a district.
  - 1.1 List five social/ health indicators that you would use to assess the status of workers in the sector with respect to alcohol abuse. (15 marks)
  - 1.2 It was decided to study the problem of alcohol abuse using “in depth interviews”.
    - 1.2.1 Describe the selection of the subjects giving justification (10 marks)
    - 1.2.2 Describe the method of “in depth interviewing” in detail. (20 marks)
  - 1.3 For the quantitative study, to identify the prevalence and the factors associated with alcohol abuse, you are given a line-list of the 50 major tea estates with approximate population of each, with a total population of about 3,00,000.
    - 1.3.1 State your preferred study design and choice of study subjects. (10 marks)
    - 1.3.2 Give details of the sample size calculation. (20 marks)
    - 1.3.3 Describe briefly the steps involved in selecting the study sample (25 marks)

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- 2.
- 2.1 Some journals report only the odds ratio and the respective 95% confidence intervals, but not the p value when reporting the results related to associations. Discuss giving reasons for and against such reporting. (40 marks)
- 2.2 Write short notes on:
- 2.2.1 Incidence prevalence bias. (20 marks)
- 2.2.2 Incidence density sampling in case control studies. (20 marks)
- 2.2.3 Three criteria for assessing causality. (20 marks)
3. A comprehensive multi-sector programme was initiated to reduce the burden due to road traffic accidents in a middle income country five years back.
- 3.1 You have been asked to evaluate this programme at the end of the fifth (5<sup>th</sup>) year. Describe the criteria you would use in the evaluation. (50 marks)
- 3.2 It was decided to conduct focus group discussions with the traffic police. Describe in detail how you would carry out a focus group discussion. (50 marks)
- 4.
- 4.1. The Government of Sri Lanka has decided to put up a 500 bed hospital to reduce the problem of chronic kidney disease (CKD) in the North Central province.
- 4.1.1 Discuss the underlying assumption/s that would have been made in taking this decision (25 marks)
- 4.1.2 Discuss the merits and demerits of this decision in relation to prevention of CKD (25 marks)
- 4.2. It is noted that a significant number of doctors are leaving the government health service early in their career. Many do not want to take up jobs in the rural areas of the country.
- 4.2.1. Discuss the possible factors that cause this phenomenon (25 marks)
- 4.2.2. State and justify three (3) policy interventions that can improve rural retention (25 marks)