

**POSTGRADUATE INSTITUTE OF MEDICINE**  
**UNIVERSITY OF COLOMBO**

**MSc (COMMUNITY MEDICINE/COMMUNITY DENTISTRY)**  
**EXAMINATION (OLD SYLLABUS)**  
**NOVEMBER 2014**

Date : 17<sup>th</sup> November 2014

Time : 9.00 a.m.- 12.00 noon.

**PAPER I**

**Answer all five (05) questions.**

**Each question to be answered in a separate book.**

1. Write notes on the following :
  - 1.1. Coefficient of determination (25 marks)
  - 1.2. Interquartile range (25 marks)
  - 1.3. Coefficient of variation (25 marks)
  - 1.4. A Power of a statistical test (25 marks)
  
2.
  - 2.1. Describe what is meant by the term 'blinding' in clinical trials. (10 marks)
  - 2.2. Discuss the importance of blinding the following people involved in a trial:
    - 2.2.1. Patient (10 marks)
    - 2.2.2. Treating clinician (10 marks)
    - 2.2.3. Outcome assessor (10 marks)
    - 2.2.4. Trial statistician (10 marks)
  - 2.3. Describe what is meant by the term 'allocation concealment' in clinical trials. (20 marks)
  - 2.4. Discuss the role of allocation concealment in reducing bias. (30 marks)

- 3.1. List three determinants of mental wellbeing in a working population. (10 marks)
- 3.2. Describe an activity you would implement as a Regional Director of Health Services to promote long term mental wellbeing of working populations. (40 marks)
- 3.3. Discuss the usefulness of this activity in improving the mental wellbeing of people concerned. (50 marks)

4.

- 4.1. Describe bias in observational studies giving an example. (20 marks)
- 4.2. A study to assess the association between diabetes and smoking compared a group of hospitalized individuals with diabetes (cases) with a group of individuals without diabetes (controls) who were full-time employees of the same hospital.

The results from this study reported a strong association between diabetes and smoking for the first time.

- 4.2.1. List giving reasons, the type/s of bias that may be present in the above study. (40 marks)
- 4.2.2. Discuss how the above biases affect the external and internal validity of this study. (40 marks)

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- 5.1. A novel non-invasive screening test to detect type 2 diabetes mellitus was reported to have a sensitivity of 75% and specificity of 80%. This test was applied to 10, 000 residents of an area with a type 2 diabetes with a prevalence of 20%.

- 5.1.1. Calculate the number of people who are likely to have positive results. (30 marks)
- 5.1.2. Calculate the positive predictive value. (10 marks)
- 5.1.3. Calculate the negative predictive value. (10 marks)

- 5.2. Discuss the implications of implementing a national program for screening for diabetes in Sri Lanka using this test. (50 marks)

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**PAPER II**

**Answer all five (05) questions.**

**Each question to be answered in a separate book.**

1. Rapid rise in chronic non communicable diseases is a serious public health concern in Sri Lanka.
  - 1.1. Write four (04) sources of data that can be used to assess this situation. (20 marks)
  - 1.2. Outline an epidemiological study to investigate whether counseling on dietary and lifestyle modifications have an effect on reducing the risk of cardiovascular disease. (50 marks)
  - 1.3. Discuss potential biases and suggest measures to minimize them. (30 marks)
2. People living in the estate sector in Sri Lanka have been affected by several social, health and environmental problems over many decades.
  - 2.1. List the key health and social issues prevailing in an estate community. (40 marks)
  - 2.2. If you are the Medical Officer of Health in an estate area, write a plan of action for uplifting health status of the people. (60 marks)
3. A study was conducted to determine whether exposure to cement dust causes tuberculosis in construction industry workers. The investigator selected 110 patients diagnosed to have tuberculosis and 110 age and sex matched apparently healthy individuals. Of the patients, 60 had long-term exposure to cement dust, whereas 40 healthy individuals had similar exposure.
  - 3.1. Summarize data in a 2 x 2 table. (20 marks)
  - 3.2. Calculate the strength of association between exposure and outcome and comment on the results. (30 marks)
  - 3.3. Calculate the statistical significance for the association, and interpret your findings. (50 marks)

4

- 4.1. During the planning stage of an alcoholic hepatitis screening programme, a group of researchers were discussing an appropriate cut off value of a liver function test to detect most number of alcoholic hepatitis cases. The two cut off values suggested were 50 IU/ml and 80 IU/ml. The sensitivity and specificity for the cut off value 50 IU/ml were 60% and 90% respectively.

What would happen to the sensitivity, specificity, proportion of false positives and negatives if the cut off value was increased to 80 IU/ml.  
(50 marks)

- 4.2. A randomized double blind clinical trial was conducted to assess the effectiveness of a new drug to treat disease A. While conducting the trial it was found that the new drug was less effective than the standard drug to treat disease A. However the funding agency, which is the manufacturing company of the new drug, insisted to continue with the research or else the funding would be discontinued.

Discuss the ethical issues. (50 marks)

5. In a randomized controlled trial comparing Medicine A to Medicine B in the prevention of fatal myocardial infarction (MI) in men older than 60 years, the following basic details were noted:

	Medicine A (n=600)	Medicine B (n = 580)
Number of cigarette smokers	150	145
Number with high HDL levels	90	29

The authors compared the outcome of patients on Medicine A vs. Medicine B and reported a relative risk of 0.4. After adjusting for the difference in high HDL levels, the relative risk was found to be 0.9.

Explain giving reasons this phenomenon. (100 marks)

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**PAPER III**

**Community Medicine candidates should answer all five (05) questions in parts A and B.**

**Community Dentistry candidates should answer all five (05) questions in Parts A and C.**

**Each question to be answered in a separate book.**

**PART A**

1. The district of Anuradhapura reported a population of 525,370 for the year 2012. The Family Health Bureau has estimated 18,482 live births in the same district for the year 2012. The National Maternal Mortality Surveillance System received 10 probable maternal death notifications for Anuradhapura district. There were 134 confirmed maternal deaths in Sri Lanka for the year 2012.

At the National Maternal Mortality review of Anuradhapura district these deaths were discussed and the outcome is given below;

Serial No.	Name	Timing of death	Cause of death	Type of death
1	Mrs. A A	POA 38 weeks	Post-partum haemorrhage	
2	Mrs. BCK	POA 7 weeks	Ruptured ectopic pregnancy	
3	Mrs. TK	Post partum 6 months	Dengue Haemorrhagic Fever	
4	Mrs. HGF	POA 34 weeks	Pneumonia - H1N1 infection	
5	Miss.CV	POA 10 weeks	Septic Abortion	
6	Mrs. BNN	Post partum day 6	Rheumatic valvular heart disease	
7	Mrs. MJ	POA 18 weeks	Snake Bite	
8	Mrs. KL	POA 10 weeks	Suicide - Hanging	
9	Mrs. GH	Post partum day 10	Suicide - Post-partum psychosis	
10	Mrs. TJ	Post partum 2 months	Peripartum Cardiomyopathy	

- 1.1. Define a maternal death. (10 marks)
  - 1.2. What is the difference between maternal mortality rate and maternal mortality ratio ? (10 marks)
  - 1.3. Classify each reported maternal death by the "Type of Death" according to the serial number given in the table.  
(DMD - Direct Maternal death, IMD - Indirect Maternal Death, LMD - Late Maternal Death, PRD - Pregnancy Related Death, RAFD – Reproductive Aged Female Death). (20 marks)
  - 1.4. Calculate the maternal mortality ratio (MMR) for the Anuradhapura district for the year 2012. (10 marks)
  - 1.5. Describe the activities you would carry out as the Medical Officer Maternal and Child Health to further reduce maternal deaths due to the above causes. (50 marks)
2. Dengue is endemic in Sri Lanka. The surveillance data since 2009 has revealed that there has been a substantial number of cases from many parts of the country (with an incidence of 220/100,000 in 2012)
- 2.1. Discuss possible reasons for this situation (40 marks)
  - 2.2. As the Medical Officer of Health, how would you plan and implement an effective dengue control programme in your area? (40 marks)
  - 2.3. Outline the new interventions which may facilitate dengue control in Sri Lanka? (20 marks)
3. Sri Lanka will be the fastest ageing country in South East Asia.
- 3.1. Describe briefly the implications of aging by 2030. (50 marks)
  - 3.2. Design a programme to promote health aging in Sri Lanka. (50 marks)

**PART B**

- 4.
- 4.1. As the Medical Officer of Health in area "X" you wish to assess the nutritional status of children under five years.
- 4.1.1. Enumerate the main evidence based interventions implemented at the grass root level to improve nutrition of children under five years. (35 marks)
- 4.1.2. List the modes of collecting information that can be used to assess the nutritional status of children. (15 marks)
- 4.2. In Sri Lanka, children with special needs have been neglected over the years. At the national level a programme has been designed to address the above issue.  
Briefly describe how you would integrate special need care interventions into the existing child health programme. (50 marks)
- 5.
- 5.1. Sri Lanka has received a substantial grant to prevent non communicable diseases .There were two opinions among the officials to design a programme. The opinion of the first group was to target individual based promotion of healthy life styles. The second group's opinion was to develop a national level mass media campaign and to develop population based health promotion policies, such as, subsidizing healthy food items and constructing walk ways to promote physical activities.  
  
Discuss the advantages and disadvantages of these two methods. (70 marks)
- 5.2. Unmet need of family planning is reported to be high among special groups such as single mothers and females of late reproductive age. Describe briefly the interventions that you would carry out as a Medical Officer of Health to address this issue. (30 marks)

## PART C

6. Write notes on :
- 6.1. Need based method in estimating dental manpower. (30 marks)
  - 6.2. Occupational risk associated with the practice of dentistry (40 marks)
  - 6.3. Screening for oral cancer/oral potentially malignant disorders. (30 marks)
- 7.
- 7.1. "Periodic monitoring and evaluation are useful in improving dental services".  
Comment on the above statement. (30 marks)
  - 7.2. Discuss the methods that would be used to evaluate school dental services in Sri Lanka. (70 marks)

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**PAPER IV**

**Community Medicine candidates should answer all five (05) questions in Parts A and B.**

**Community Dentistry candidates should answer all five (05) question in Parts A and C.**

**Each question to be answered in a separate book.**

**PART A**

1.
  - 1.1. List five (05) key strategies of the National policy for prevention and control of chronic non-communicable diseases of Sri Lanka.  
(25 marks)
  - 1.2. List the five (05) action areas of health promotion as described in the Ottawa Charter of 1986.  
(15 marks)
  - 1.3. Describe giving examples how each of the action areas mentioned in 1.2. are applied in the non-communicable disease (NCD) prevention programme in Sri Lanka.  
(60 marks)
  
2.
  - 2.1. Describe the criteria used to incorporate diseases into the national disease notification system.  
(50 marks)
  - 2.2. Describe the activities which a public health inspector has to carry out during the field investigation of a notified communicable disease. Indicate how these activities contribute to the control of communicable disease at community level.  
(50 marks)

3. Emissions from vehicular traffic are considered as an important cause of urban air pollution.
- 3.1. List the health problems commonly attributed to air pollution. (20 marks)
- 3.2. List the pollutants that contribute to urban air pollution from vehicular traffic. (20 marks)
- 3.3. Describe the measures that could be recommended to reduce air pollution from vehicular traffic. (60 marks)

### **PART B**

- 4.
- 4.1. An increase in the number of cases of leptospirosis has been reported during the last few years. Describe possible environmental, climatic and socio-demographic factors responsible for this increase. (20 marks)
- 4.2. List the possible sources of information that would indicate an increase in the suspected cases of leptospirosis in a Medical Officer of Health area. (20 marks)
- 4.3. Describe the primary and secondary preventive measures you would take as a Regional Epidemiologist to control a leptospirosis outbreak in a district. (60 marks)
5. Write notes on :-
- 5.1. Occupational problems in paddy farmers. (40 marks)
- 5.2. Notification of occupational accidents. (30 marks)
- 5.3. Prevention of occupational stress in garment factory workers. (30 marks)

## PART C

6.
  - 6.1. Write a critical account of the DMF (Decayed, Missing, Filled) index as a measure of dental caries. (20 marks)
  - 6.2. Critically assess the various options for a preventive programme for dental caries in Sri Lanka. (80 marks)
  
7. Write notes on :-
  - 7.1. Reorientation of oral health services in Sri Lanka to provide quality oral health care. (60 marks)
  - 7.2. Role of school dental therapists in promoting health of preschool children. (40 marks)