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POSTGRADUATE INSTITUTE OF MEDICINE
UNIVERSITY OF COLOMBO

MSc (COMMUNITY MEDICINE/COMMUNITY DENTISTRY)
EXAMINATION – JANUARY 2023

Date:- 30th January 2023

Time:- 9.00 a.m. – 12.00 noon

PAPER I

Community Medicine candidates should answer **all six (06) questions in Parts A and B.**

Community Dentistry candidates should answer **all six (06) questions in Parts A and C.**

Each question to be answered in a separate book.

PART A

1. A researcher wanted to assess the effectiveness of two antihypertensive drugs (A and B). He recruited 18 patients. He measured their systolic blood pressure before starting treatment and after completing 1 month of treatment. The results are given in the table below.

	Subject	Systolic blood pressure (mmHg)			
		Before treatment	After treatment	Difference	
A	1	140	142	-2	
	2	145	145	0	
	3	150	145	5	
	4	135	140	-5	
	5	160	155	5	
	6	140	140	0	
	7	148	142	6	
	8	155	145	10	
	9	165	160	5	
	Total		1338	1314	24
	Mean		148.7	146	2.7
Standard deviation		9.9	6.9	4.7	
B	1	150	140	10	
	2	140	142	-2	
	3	155	145	10	
	4	145	138	7	
	5	150	140	10	
	6	153	145	8	
	7	160	155	5	
	8	148	140	8	
	9	150	138	12	
	Total		1351	1283	68
	Mean		150.1	142.6	7.5
Standard deviation		5.7	5.3	4.1	

- 1.1. Assuming that systolic blood pressure is normally distributed,
- 1.1.1. Carry out a statistical test to determine if drug A has any effect on systolic blood pressure.
State the hypotheses to be tested and give the details of the calculations. (40 marks)
- 1.1.2. Carry out a statistical test to compare the effectiveness of the two drugs A and B on controlling systolic blood pressure.
State the hypotheses to be tested and give the details of the calculations. (40 marks)
- 1.1.3. Interpret your results in 1.1.1. and 1.1.2 above. (20 marks)
(Statistical tables are provided for reference)
2. A researcher assessed the validity of two serum biomarkers, namely, alpha-fetoprotein protein (AFP) and neutrophil-to-lymphocyte ratio (NLR) as screening tests for hepatocellular carcinoma (HCC).
The sensitivities for AFP and NLR were 0.767 (95% CI=0.721–0.807) and 0.864 (95% CI=0.835–0.893), respectively. The specificities for AFP and NLR were 0.596 (95% CI=0.545–0.645) and 0.466 (95% CI=0.394–0.540), respectively. Of the 10,000 population tested, 1,200 were diagnosed as having HCC.
- 2.1. Calculate the following:
- 2.1.1. True positives when testing for AFP. (20 marks)
- 2.1.2. Positive predictive value of AFP testing. (20 marks)
- 2.2. AFP screening test was used to test HCC in a different population in which the prevalence was higher than in the population in which the test was assessed.
Outline how the predictive values of AFP test would change with the disease prevalence in the two populations. (20 marks)
- 2.3. Outline the concept of simultaneous testing of two screening tests. (10 marks)
- 2.4. The researcher carried out simultaneous testing of AFP and NLR to screen for HCC.
Calculate the net sensitivity of simultaneous testing with AFP and NLR. (30 marks)

3.

3.1. Country B recorded a total mid-year population of 90 million in 2019. There were 3,600,000 live births and 990,000 deaths during this year. Out of the deaths, 326,000 occurred among children less than 5 years of age. There were 216,000 infant deaths. The estimated number of maternal deaths was 18,000. Life expectancy at birth was 61.2 years and the total fertility rate was 6.0 in 2019.

3.1.1. Calculate five (05) relevant demographic indicators for country B for 2019 using the given data. (30 marks)

3.1.2. Comment on the

(a) health status of the population of country B. (15 marks)

(b) health care services of country B. (15 marks)

3.2. Figure 1 shows the population pyramid of Sri Lanka in 1981 and the projected population pyramid for Sri Lanka for 2030. Discuss how the health and social services should be adapted to address the population needs in 2030 considering the demographic transition. (40 marks)

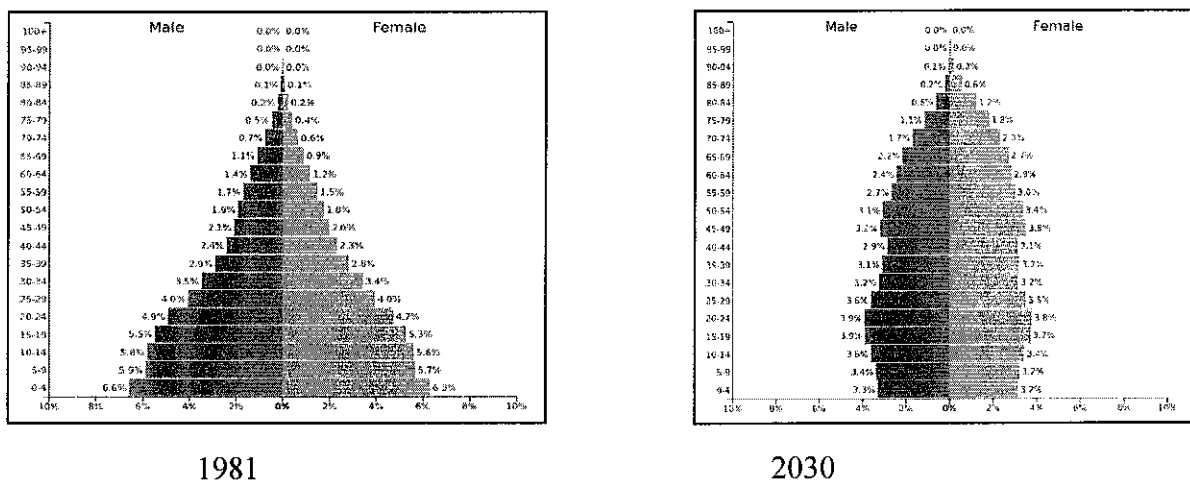


Figure 1: Population pyramids in 1981 and 2030 (projected) for Sri Lanka

PART B

4.

4.1. A Medical Officer of Health (MOH) office gets a complaint from neighbours of a chemical factory that the factory discharges wastewater to a nearby canal, and smoke generated from manufacturing process is directly discharged to the atmosphere.

As the MOH, describe how you would investigate this complaint.

(50 marks)

4.2. As a MOH in a predominantly paddy cultivating area, you want to improve the knowledge of farmers on safe occupational practices and prevention of environmental pollution.

4.2.1. Outline how you would organize an awareness session for the farmers in the area. (20 marks)

4.2.2. Briefly describe the specific aspects that will be covered in the session. (30 marks)

5. In a rural Medical Officer of Health (MOH) area "X" in 2016, the Contraceptive Prevalence Rate (CPR) for any method was 60%, the Modern Method Contraceptive Prevalence Rate (mCPR) was 45% and the Unmet Need (UMN) for family planning was 12%.

5.1. Define the following terms:

5.1.1. Contraceptive Prevalence Rate (CPR). (05 marks)

5.1.2. Modern Method Contraceptive Prevalence Rate (mCPR). (05 marks)

5.1.3. Unmet Need (UMN) for family planning. (05 marks)

5.1.4. Demand Satisfied with Modern Methods. (05 marks)

5.2. As per the Sri Lanka Demographic and Health Survey 2016 (SLDHS 2016), the CPR for any method was 64%, while the mCPR and UMN for family planning were 53.6% and 7.5%, respectively.

Comment on the performance of MOH area "X" in comparison to the SLDHS 2016. (25 marks)

5.3. Outline the challenges you are likely to face as a MOH in addressing the UMN for family planning due to the current socio-economic crisis. (25 marks)

5.4. Briefly describe the actions you would take to reduce the UMN for family planning among adolescents in MOH area "X". (30 marks)

6.

6.1. "Nutrition status among children under five years in Sri Lanka is a major public health problem, which has been aggravated by the present economic crisis in the country."

6.1.1. Briefly discuss the above statement. (30 marks)

6.1.2. List four (04) direct (specific) nutrition interventions to address the above issue. (20 marks)

6.2. "Nurturing Care Framework for Early Child Development" was introduced nationally through the family health programme recently.

6.2.1. List the five (05) components of the "Nurturing Care Framework for Early Child Development". (20 marks)

6.2.2. Briefly describe the importance of prioritizing the "Nurturing Care Framework for Early Child Development" for the child and family, especially within the first 1000 days of life, by **policy makers**. (30 marks)

Contd...../6-

PART C

7. School dental therapists in a district request the Regional Dental Surgeon (RDS) for a suitable oral health promotion package for school children aged 5 to 13 years.

7.1. As the RDS, list five (05) important aspects you would consider in drafting a suitable oral health promotion package. (20 marks)

7.2. Describe the components that should be included in the oral health promotion package. (40 marks)

7.3. Describe the importance of inter-sectoral collaboration in drafting and implementing the oral health promotion package. (40 marks)

8.

8.1. Describe how the current economic crisis in Sri Lanka affects the:

8.1.1. Oral health-related behaviour of public. (30 marks)

8.1.2. Oral healthcare provision. (30 marks)

8.2. Describe the measures you would recommend to a policymaker to minimize the effects of the economic crisis on oral health. (40 marks)

9. Discuss the following statements:

9.1. "High sugar consumption is the main risk factor for dental caries." (30 marks)

9.2. "Population strategy is better than high risk strategy in prevention of oral cancers in resource poor settings." (40 marks)

9.3. "Pictorial warnings on the cigarette packs resulted in reduction of smoking in the recent past in Sri Lanka." (30 marks)

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EXAMINATION – JANUARY 2023

Date:- 31st January 2023

Time:- 9.00 a.m. – 12.00 noon

PAPER II

Answer all six (06) questions.

Each question to be answered in a separate book.

1. The district “X” has reported more than 500 cases of Influenza-like illness (ILI) in December 2022. The number of cases of ILI reported during the month of December for the last 5 years was around 250.
 - 1.1. Outline the basic principles of deciding whether district “X” had an ILI outbreak in December 2022. (20 marks)
 - 1.2. As the Regional Epidemiologist of district “X” you have been assigned to investigate the said ILI outbreak.
Describe the key steps in investigating this ILI outbreak. (60 marks)
 - 1.3. List four (04) broad categories of vulnerable or high-risk groups which have a higher chance of developing complications with ILI. (20 marks)
2.
 - 2.1. List two (02) health promotion outcomes in reducing non-communicable diseases (NCDs). (10 marks)
 - 2.2. Health Belief Model (HBM) is a widely used theory to explain the vaccine acceptance.
Briefly describe how COVID-19 vaccine acceptance changed over time in Sri Lanka, using the HBM. (40 marks)
 - 2.3. Discuss the following statement.
‘Village-level health promotion settings would reduce the workload of the Public Health Midwife.’ (50 marks)

Contd...../2-

3. The current economic crisis in Sri Lanka requires reemphasizing selected strategies to address health problems relevant to perinatal outcomes.
- 3.1. List five (05) managerial competencies that will be useful to a Medical Officer of Health (MOH) during this crisis. (20 marks)
- 3.2. List two (02) indicators that measure antenatal parental sessions, to improve perinatal outcomes. (10 marks)
- 3.3. Briefly explain how a MOH would use the above stated indicators at the monthly conference to improve perinatal outcomes in the area. (30 marks)
- 3.4. More partnerships and collaborations with other stakeholders are envisaged during this period of economic crisis in Sri Lanka, to improve the perinatal outcomes.
As a MOH, outline the steps for a two-year project to improve perinatal outcomes through nutrition related interventions utilizing the funds available with a local Civil Society Organisation. (40 marks)
- 4.
- 4.1. As a Medical Officer of Health (MOH) you have received a written complaint against a Management Assistant for issuing a fake digital COVID-19 vaccine certificate from the MOH Office. You have decided to conduct a preliminary inquiry regarding this complaint.
- 4.1.1. State the objective of conducting a preliminary inquiry. (10 marks)
- 4.1.2. Outline the process of appointing an officer to conduct a preliminary inquiry. (10 marks)
- 4.1.3. Based on the report of the preliminary inquiry, outline the actions that would be taken as a MOH. (30 marks)
- 4.2. Community-based rehabilitation services are not well established in Sri Lanka to address the burden of disability due to stroke.
- 4.2.1 List three (03) rehabilitation services available at institutional level for patients with stroke. (15 marks)
- 4.2.2. A Medical Officer of Health (MOH) wishes to establish rehabilitation services for patients with disability due to stroke in his/her area. Briefly describe how he/she could establish the relevant rehabilitation services according to the "World Health Organisation Community Based Rehabilitation (CBR) matrix" . (35 marks)

5.

- 5.1. List three (03) life situations that can adversely affect the professional life of a 35-year-old doctor. (15 marks)
- 5.2. Describe how he/she can successfully overcome one (01) of the situations mentioned in 5.1, so that the mental wellbeing is brought to normal and further advanced. (35 marks)
- 5.3. Discuss the adequacy of the reach of mental health services to adolescents and young adults in Sri Lanka. (50 marks)

6.

- 6.1. Trends in number of hospital admissions due to traumatic injuries in Sri Lanka is given below (Figure 1).

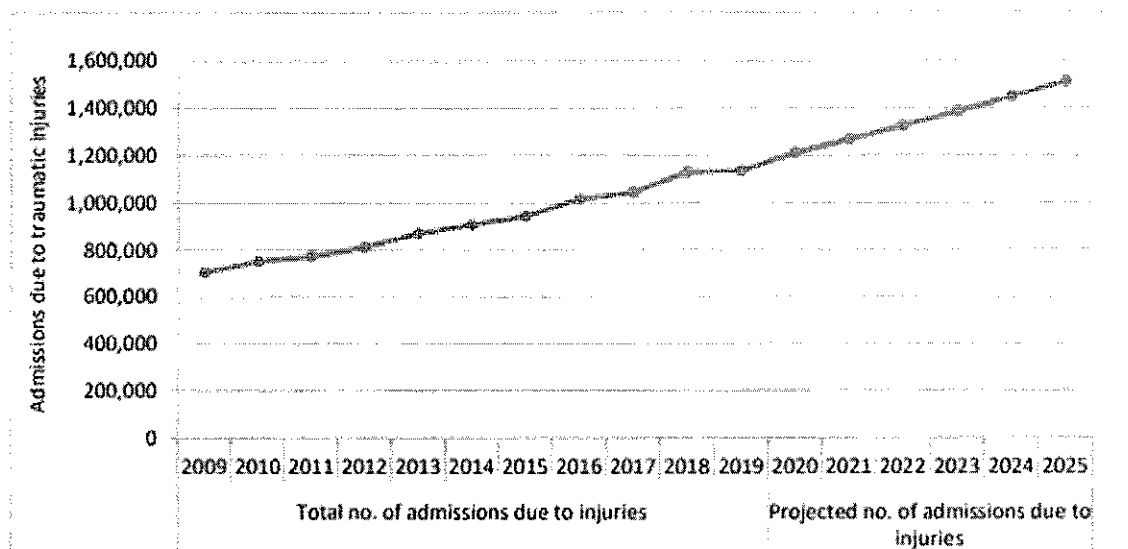


Figure 1: Number of inward admissions due to injuries to government hospitals between 2009 and 2019 and projection from 2020 to 2025 (Annual Health Bulletin 2019)

- 6.1.1. Describe the pattern observed in this graph. (20 marks)

- 6.1.2. Discuss the following statement:

“The burden of disease in Sri Lanka due to traumatic injuries is not truly reflected in the above graph”. (30 marks)

- 6.2. Current chronic non-communicable disease (NCDs) prevention and control programme in Sri Lanka is carried out through a life cycle approach.

- 6.2.1. List four (04) activities in the school health programme in Sri Lanka for prevention and control of NCDs. (20 marks)

- 6.2.2 Describe the challenges faced by Medical Officer of Health (MOH) in implementing chronic NCD prevention and control activities at schools. (30 marks)