

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

**MD (COMMUNITY MEDICINE/COMMUNITY DENTISTRY) THEORY**  
**EXAMINATION – MAY 2024**

**PAPER I**

**Date:-** 20<sup>th</sup> May 2024

**Time:-** 9.00 a.m. 11.00 a.m.

Answer **all four (04)** questions.  
Answer each question in a separate book.

1. A cross-sectional study was conducted in a group of street vendors in Colombo city (group 1) to assess adverse health conditions related to their exposure to on-road air pollutants. To assess the risk of occupation-related health conditions, this group was compared with two other groups of non-street vendors, selected from the same area (group 2) and from a less traffic-congested area outside the city limits (group 3).
  - 1.1. State the eligibility criteria for the group of street vendors (group 1).

(15 marks)
  - 1.2. Identify one (01) setting each from which groups 2 and 3 could be selected.

(10 marks)
  - 1.3. State the purpose of recruiting groups 2 and 3 for assessing the occupational risk of health conditions among street vendors. (15 marks)
  - 1.4. Health conditions are assessed using an interviewer-administered questionnaire and lung function tests.

(20 marks)

Describe how the quality of data could be ensured.
  - 1.5. The following results were obtained regarding presence of dry cough during past three months:

Group 1 - 10 persons out of 60  
Group 2 - 5 persons out of 60  
Group 3 - 2 persons out of 60

Perform data analysis to assess the risk of occupation-related dry cough among street vendors.

(30 marks)
  - 1.6. Name the analysis you would use to adjust for confounders. (10 marks)

Contd.../2-

2.

2.1. A team of researchers were interested in finding out the impact of air pollution on Parkinson disease. The study recruited 54,524 subjects registered for services in a health unit area during the years 1995 -1999, and followed them up over a period of 15 years. The selected subjects were from areas with air quality monitoring facilities. During this period, 1060 subjects were diagnosed with Parkinson disease. The control subjects were selected with a ratio of 1:4 (case: control), from the same population, matched for age, sex and the year of diagnosis.

2.1.1. Identify the study design and comment on its suitability to address the given research objective. (25 marks)

2.1.2. State one (01) exclusion criterion that should be applied on recruitment. (10 marks)

2.1.3. A multivariate analysis revealed that people living in the urban areas had a higher risk for developing Parkinson disease (OR=1.33,  $p < 0.05$ ).

State the analysis that should be performed to explore this association further. (15 marks)

2.1.4. The research team found a systematic review where, the pooled relative risk (RR) for incidence of Parkinson disease following an increase in long-term exposure to particulate matter (PM<sub>2.5</sub>) was 1.06 (95% CI: 0.99, 1.14) and the pooled RR for a hospital admission due to Parkinson disease after short term exposure to PM<sub>2.5</sub> was 1.03 (95% CI: 1.01, 1.05). There was high heterogeneity between study-specific results for most of the analyses, attributed to different populations under study.

Interpret the findings of the above systematic review. (20 marks)

2.2. A concern is raised in social media groups on poultry consumption as a risk factor of early menarche in Sri Lankan girls.

Discuss the appropriateness of a case-control study design to investigate this concern. (30 marks)

3.

3.1. A study was conducted to assess how 'control of external events' and 'control of internal states' affect 'perceived stress' in university undergraduates. All three variables were assessed on a continuous scale and the analysis was performed using multiple linear regression.

3.1.1. List three (03) assumptions that should be met in conducting multiple linear regression analysis. (15 marks)

The ANOVA table of the analysis is given below:

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	6806.728	2	3403.364	b	0.001
Residual	7725.756	a	18.264		
Total	14532.484	425			

3.1.2. Calculate 'a' and 'b' values. (10 marks)

3.1.3. Calculate and interpret  $R^2$  value of this model. (20 marks)

The regression coefficients of the analysis are given below:

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
	B	Std Error	Beta			Lower Bound	Upper Bound
(Constant)	50.971	1.273		40.035	0.001	48.469	53.474
Control of external events	-0.625	0.061	-0.424	-10.222	0.001	-0.745	-0.505
Control of internal states	-0.175	0.020	-0.360	-8.660	0.001	-0.215	-0.136

3.1.4. Describe the association between 'control of internal states' and 'perceived stress'. (15 marks)

Contd.../4-

- 3.2. In a study conducted to assess the predictors of burnout among teachers, binary logistic regression analysis was carried out and the results of the final model are given below:

	B	S.E.	Wald	df	Sig.	Exp(B)	95% CI for Exp(B)	
							Lower	Upper
Age (in years)	-0.006	0.014	0.193	1	0.660	0.994	0.968	1.021
Sex (0=Female, 1=Male)	-0.108	0.315	0.118	1	0.731	0.897	0.484	1.663
Job satisfaction (Score 1-100)	-0.448	0.165	7.366	1	0.007	0.639	0.462	0.883
Diagnosed physical health problems (0=No, 1=Yes)	0.716	0.339	4.464	1	0.035	2.046	1.053	3.976
Work control (0=Satisfactory, 1=Poor)	1.984	0.325	37.311	1	0.001	7.274	3.848	13.748
Constant	1.953	1.451	1.812	1	0.178	7.053		

$$\chi^2(5) = 76.020, p < 0.001$$

- 3.2.1. List the statistically significant independent variables in the final model. (10 marks)
- 3.2.2. Describe the association between burnout and sex. (10 marks)
- 3.2.3. Based on these results, write a prediction equation to predict burnout. (20 marks)
- 4.
- 4.1. It has been revealed that a large number of unused viable fertilized ova are stored in laboratories offering fertility care. As the storage capacity of the labs are exhausted laboratory authorities are contemplating on **the ethics of discarding these ova** and seek your opinion on this. Discuss your response. (60 marks)
- 4.2. A MSc student is doing a study to look for underlying causes of accidental burns of women admitted to Burns Unit, NHSL. The student has worked in this unit for over 10 years. A few women reveal during their interview that the burns were infact inflicted on them by their spouses, amounting to homicide. Describe the actions the student should take considering the ethics obligations as a researcher. (40 marks)

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**PAPER II**

**Date:-** 21<sup>st</sup> May 2024

**Time:-** 9.00 a.m. 11.00 a.m.

Answer **all four (04)** questions.

Answer each question in a separate book.

1. The government procurement process should follow the provisions in financial regulations, guidelines and circulars. Some officials attribute the delays in procurement to this strictly regulated process and blame that regulations and guidelines are not up to date with the current market practices.
  - 1.1. Outline the factors in the government procurement process, that can cause delays. (35 marks)
  - 1.2. Briefly describe how proper procurement planning can minimize the delays in government procurement. (30 marks)
  - 1.3. Discuss the role of information technology in medical procurement process in Sri Lankan context. (35 marks)
2.
  - 2.1. Define opportunity cost, and briefly discuss its relevance in the health sector decision making (20 marks)
  - 2.2. Discuss how pooling mechanisms in health care financing affect the equity and access to healthcare services. (25 marks)
  - 2.3. Outline the factors to be considered in deciding the number of doctors needed for a country. (25 marks)
  - 2.4. Discuss the strategies that can be implemented to address shortages of health care workforce created by the current outward migration of different categories of health care workers. (30 marks)

Contd.../2-

3.

3.1. A recent survey highlighted that micronutrient deficiencies are highly prevalent among children under five years of age in a rural district in Sri Lanka. As a Consultant Community Physician attached to Regional Director of Health Services office,

3.1.1. Briefly describe your plan to conduct a situational analysis for a social-behaviour change campaign (SBCC) to address the above issue. (20 marks)

3.1.2. Discuss how you would monitor and evaluate the social-behaviour change campaign (SBCC) in the district. (20 marks)

3.2. Discuss how the community empowerment concept can be used for primordial and primary prevention of non-communicable diseases (NCD) at the Public Health Midwife (PHM) area level. (20 marks)

3.3. Evidence suggests that 'the use of randomised control trials to evaluate health promotion initiatives in most cases is inappropriate, misleading, and expensive'.

Discuss this statement. (40 marks)

4. In Sri Lanka, due to the current economic crisis a large number of people are pushed into poverty with restricted access to health care. The economic crisis has a significant impact on health service delivery. This requires exploring better ways of investing existing funds in health services.

4.1. Describe the need for developing a policy on health financing for Sri Lanka. (30 marks)

4.2. List the stakeholders to be involved in developing a health financing policy. (25 marks)

4.3. Describe the technical, administrative and political processes in developing a policy on health financing. (45 marks)