## POSTGRADUATE INSTITUTE OF MEDICINE UNIVERSITY OF COLOMBO

# MD (COMMUNITY MEDICINE/COMMUNITY DENTISTRY) PART I EXAMINATION - AUGUST 2013 

Date :- $12^{\text {th }}$ August 2013
Time :- 1.30 p.m. -3.30 p.m.

## PAPER I

Answer all four questions.
Answer each question in a separate book.

1. A researcher wishes to study the prevalence of diabetes mellitus in adults above 60 years of age in a district, where previous studies have shown the estimated prevalence to be $35 \%$. The researcher desires to be $95 \%$ confident that his estimate will be within $5 \%$ (absolute percentage points) on either side of the true prevalence.
1.1. Calculate the sample size required for this study.
1.2. Briefly explain the terms used in the calculation of the sample size.

The researcher proceeds to do the study on a simple random sample of 400 persons, and obtains a prevalence rate of $26.5 \%$.

> 1.3. Calculate the $95 \%$ confidence interval for the estimated prevalence of $26.5 \%$ obtained by the researcher.
> (10 marks)

Consider an alternate scenario, where the researcher does not have the list of adults in the district. The researcher decides to use cluster sampling, with 'village' as the sampling unit, assuming a design effect of 2 and decides to study 30 clusters.
1.4. What is meant by design effect?
(15 marks)
1.5. State the formula to calculate the design effect and explain the terms used.
(15 marks)
1.6. Briefly describe (step-wise) how this sample will be identified. ( 35 marks)

Contd..../2-
2. You work in a renal hypertension unit and are told by the administration to look for a new test to identify renal disease in hypertension. In an article in a reputed medical journal, you come across a test called the urinary test A (UTA) to detect the presence of renal disease among patients with hypertension. The authors claim that the UTA is useful to assess the need for an expensive confirmatory test.

The results indicate that among 137 hypertensive patients, 54 were confirmed to have renal disease, 67 tested positive for the UTA test and false positives were 23 .
2.1. What proportion of patients with renal disease is detected by the UTA?
(10 marks)
2.2. State the technical term for the above attribute of this test. ( 05 marks)
2.3. What is the overall accuracy of the UTA?
2.4. Calculate the pre-test probability of renal diseases in the patients.
(10 marks)
2.5. What is the post-test probability of renal disease?
(10 marks)
2.6. Discuss the evaluation of the UTA in the detection of renal disease among patients with hypertension.
3.
3.1. Explain the term "Participatory Rapid Appraisal".
(20 marks)
3.2. Enumerate the strengths and weaknesses of qualitative research methods in comparison to quantitative research methods.
(30 marks)
3.3. You have been asked to evaluate a project aimed at improving breast feeding practices in a rural area. Describe the qualitative research techniques you would use in this evaluation.
(50 marks)
4. A nutritional survey among preschool children revealed a high prevalence of stunting in province X compared to the national average.

4.2. Discuss the usefulness of the above types of plans in reducing
prevalence of stunting among the preschool children of province $X$. (40 marks)

In an attempt to address high prevalence of stunting of preschool children in the country, a landscape analysis was performed in province $X$ examining the readiness of stakeholders' commitment and capacity to scale up nutritional interventions. Results showed that stakeholders' commitment to scale up nutrition interventions was weak.
4.3. List the likely stakeholders in the above situation.
(15 marks)
4.4. Describe the aspects to be considered in organizing stakeholders' meetings to address the issue of weak levels of commitment.
(30 marks)

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Date :- $13^{\text {th }}$ August 2013
Time :- 9.00 adm. - 11.00 a.m.

## PAPER II

Answer all four questions.
Answer each question in a separate book.

1. A study was conducted to assess the association between occupational stress and diastolic blood pressure among middle level administrators. Work stress was assessed using an instrument termed as Work Stress Index (WSI). Construct and criterion validity of WSI were assessed. The sensitivity was found to be $85 \%$ and the specificity to be $80 \%$. The reported results are given in Table 1.

Table 1 Association between occupational stress and diastolic blood pressure among middle level administrators by sector of residence

| Sector of residence | Mean diastolic blood pressure |  | P value* |
| :--- | :---: | :---: | :---: |
|  | High occupational stress | Low occupational stress |  |
| Urban | 95 | 85 | $<0.01$ |
| Rural | 90 | 87 | $<0.01$ |
| Estate | 85 | 80 | $<0.05$ |

*Student's t-test
1.1. Briefly describe how would you assess construct validity? (20 marks)
1.2. Comment on the statistical analysis used in the above table. ( 10 marks)
1.3. Briefly describe alternate statistical analyses which could be used in the above study.
(30 marks)
Investigators further reported the results of a case control study to determine risk factors for occupational stress among middle level administrators. Cases and controls were defined based on the specified cutoff values according to WSI obtained in the above study. The reported results are given in Tables 2 and 3.

Table 2 Unadjusted odds ratios for risk of occupational stress among middle level administrators

| Exposures | Odds ratio | 95\% confidence interval | P value |
| :--- | :---: | :---: | :---: |
| Age $>40$ years | 2.5 | $2.0-3.5$ | $<0.05$ |
| Engaged in leisure time activities | 3.0 | $1.8-4.5$ | $<0.05$ |
| Educational level < GCE <br> (Advanced Level) | 3.3 | $2.5-4.0$ | $<0.05$ |
| Low social class | 2.2 | $1.5-3.5$ | $<0.05$ |

Table 3 Adjusted odds ratios for risk of occupational stress among middle level administrators

| Exposures | Odds ratio | 95\% confidence interval | P value |
| :--- | :---: | :---: | :---: |
| Age $>40$ years | 2.5 | $1.8-3.7$ | $<0.05$ |
| Engaged in leisure time activities | 3.8 | $1.5-5.2$ | $<0.05$ |
| Educational level < GCE <br> (Advanced Level) | 3.5 | $2.3-5.6$ | $<0.05$ |
| Low social class | 0.5 | $0.02-0.95$ | $<0.05$ |

Hosmer and Lemeshow Test: Chi-square $=1.98 ; p$ value $=0.63$

### 1.4. Comment on the selection of cases and controls.

1.5. Comment on the adequacy of the model.
2. An investigator has developed a database of 5000 persons over 30 years of age to study the occurrence of cardiovascular diseases among them. He plans to study these outcomes every year.
2.1. List the baseline data (excluding socio-demographic data) which he should have collected.
2.2. State the study design.
2.3. He decides to recruit cases of hypertension for a study to evaluate risk factors of hypertension. State the study design.
2.4. State the advantages and disadvantages in assessing the risk factors for hypertension using the data.
2.5. Explain the term 'censoring' in relation to this data.
(10 marks)
2.6. The investigator wishes to assess the survival of the subjects from ischaemic heart disease.
State two (02) methods of analysis which he could use.
(10 marks)
2.7. Explain the usefulness of survival analysis giving examples. ( 15 marks)
2.8. List methods which could be used to collect follow up information from the subjects.
(20 marks)
3. Migration is an important social determinant of health. The World Health Organization has identified the need to address the issue of 'migration health' in the post millennium development agenda.
3.1. List the types of migration that influence health and socio economic outcomes in Sri Lanka.
3.2. Describe steps in a policy process led by the Ministry of Health, that would be relevant to develop a migration health policy for Sri Lanka.
(50 marks)
3.3. Give two (02) examples of policy implementation tools and discuss their use.
(40 marks)
4.
4.1. Describe what is meant by 'out of pocket expenditure' in health. (20 marks)
4.2. Discuss how analysis of 'out of pocket expenditure' in health can be used to review the healthcare financing situation in a country.
4.3. Describe the term 'universal health coverage'.
(20 marks)
4. 4. Compare and contrast between advocacy tools and health education
tools.

