IIHMR University

MBA HOSPITAL & HEALTH MANAGEMENT

I YEAR

ESSENTIALS OF EPIDEMIOLOGY

FINAL EXAMINATION
Friday, November 14, 2014

Time: 2.00 hours **Maximum Marks - 70**

Instructions:

1. This question paper contains **08 printed sides** and has two sections.
2. Please **ensure** that your paper has both the sections.
3. Attempt all questions on this paper and **return it to the invigilator** at the end of the exam.

Roll Number | | | | |

Batch _____

Section _____

Date | | | | | | |

Signature of Invigilator_____

Marks obtained | |

Signature of Examiner_____

Section A

Circle true (T) or false (F)

1 marks each

1. T/F Incidence rate is a measure of Absolute Risk.
2. T/F In a Ratio, the Numerator is part of Denominator.
3. T/F In age specific rates, the denominator should be the population in that age specific group.
4. T/F The proportional mortality rate is percent deaths caused by a disease out of total deaths due to all causes.
5. T/F The point prevalence rate is the proportion of the population that has an outcome/disease at a specific point in time.
6. T/F Person years of exposure may be used as denominator to measure outcomes in Cohort Studies.
7. T/F A screening test should be both reliable and valid.
8. T/F The sensitivity of screening test is the proportion of people who have the disease classified correctly as having the disease by the screening test.
9. T/F Positive Predictive Value of a Screening Test is the proportion of test positive cases out of total True positives and False positive cases.
10. T/F Validity of a screening test is a measure of precision.
11. T/F In Hypothesis testing, one commits Type I error when results of the study showed that the two groups are different while in reality there re not different.
12. T/F Descriptive studies help us in testing the hypothesis of cause and effect relationship.
13. T/F Causality cannot be determined by cross-sectional studies because temporal relationship cannot be demonstrated.
14. T/F In a Randomized Clinical Trial, the study population is composed of study subjects randomly assigned as treatment or control group.
15. T/F A Confounding factor may affect the estimates of risk.

16. T/F In Randomized Control Trials, comparability of the characteristics of the study and the placebo group is essential to control the effect of confounding factors.

17. T/F In the cohort study design, the subjects are free from the disease under study.

18. T/F A relative risk equal to 1 signifies that there is no association between the risk factor and the disease.

19. T/F Case -Control Studies are appropriate when the disease is rare and the exposure is common.

20. T/F Odds Ratio in case control study is equivalent of relative risk as measured in cohort studies.

Section B

2 marks each

In this section, there are multiple choices for each question. There is one correct answer. ENCIRCLE the correct answer:

1. Incidence Rate measures:

   a) Frequency occurrence of new cases
   b) Magnitude of old cases
   c) Magnitude of old and new cases
   d) Number of cases attributed to a cause
   e) None of the above

2. As a manager, which of the following health statistics would use to select a risk factor to target for intervention in order to have the greatest health impact in the limited resource settings?

   (a) Incidence Rate.
   (b) Attributable Risk
   (c) Prevalence Rate.
   (d) Relative risk of the disease
   (e) Proportionate mortality.

3. In a hospital 5000 patients with various diseases were admitted in a year. During the year 1000 patients died from various causes during the year. Out of these deaths, 300 patients died of CVD. The proportional mortality rate for CVD in the hospital is:

   a) 6.0 %
   b) 20.0%
   c) 40.0%
   d) 10.0%
   e) 30.0%

4. Crude and age-adjusted mortality rates (per 1000,000 people) from Coronary Heart Disease are shown for India and the United States for 2000 in the following table :

	Crude Rates	Age-Adjusted Rates
India	67.4	58.2
United States	316.3	131.4
Ratio, United States, Chile	4.7	2.3

Which of the two rates is preferable for comparing the mortality rate from heart disease in the two countries?

   a) Age adjusted rates
   b) Crude rates
   c) Age specific rates
   d) Ratio of crude rates
   e) None of the above

5. Five years after the introduction of a vigorous detection and treatment program, the prevalence of diabetes mellitus was found to be greater than in the year prior to the introduction of the program. Which of the following are possible reasons?

a) An increase in previously undetected cases
b) A reduction in the risk factors predisposing to diabetes
c) A decrease in case fatality rate of diabetes
d) An increase in the proportionate mortality of diabetes
e) None of the above

6. In order to assess how strongly related an exposure is to a disease, which would be the best health statistic?

a) Incidence of the disease
b) Attributable risk
c) Prevalence of the exposure
d) Relative risk
e) Proportionate mortality

7. Case fatality rate for a given disease refers to

a) The crude mortality rate per 100,000 populations
b) Cause-specific mortality rate due to the disease
c) A fatal outcome of any disease
d) The percentage of deaths among cases of the disease
e) The proportion of deaths due to the disease among all deaths from all causes

8. A cohort study of women aged 20 to 25 years in India found that the Incidence rate of cervical cancer in women who used oral contraceptives was 5/100,000 and that it was 2/100,000 in those who did not use oral contraceptives. On the basis of these data, the inference that taking oral contraceptives causes cervical cancer is

a) Correct
b) Incorrect due to failure to distinguish between incidence and prevalence
c) Incorrect due to failure to adjust for confounding factor (age) for possible difference in age distribution of users and nonusers
d) Incorrect because there was a selection bias.

9. Which of the following statements describes the major advantages of a randomized clinical trial?

a) It avoids observer bias.
b) It lends itself to ethical justification.
c) It yields results replicable in other patients.
d) Selection bias is reduced or eliminated
e) It enrolls representative patients required to support the inference

10. A "double blind" randomized study of a vaccine is one in which:

(a) The study group receives the vaccine and the control group receives a placebo.
(b) Neither observer nor subjects know the nature of the placebo.
(c) Neither observer nor subjects know which subject receives the vaccine and which receives a placebo.
(d) Neither the study group nor the control group knows the identity of the observers.
(e) The control group does not know the identity of the study group.

11. In a Screening program, prevalence of coronary heart disease was found in 10 per 1,000 men aged 30 to 44 and in 5 per 1,000 women aged 30 to 44. The inference that in this age group men and women have higher risk of developing coronary heart disease is:

(a) Correct
(b) Incorrect because of failure to distinguish between incidence and prevalence
(c) Incorrect because a proportionate ratio is used when a rate is required to support the inference
(d) Incorrect because of failure to recognize a possible cohort phenomenon
(e) Incorrect because there is no control or comparison group.

12. In vaccine trial 2,000 randomly selected children two years of age were given polio vaccine against a poliomyelitis. The vaccinated children were followed for 10 years for occurrence of the poliomyelitis. Of these, 80% were never afflicted with the disease. Which is the most correct conclusion regarding the efficacy of the vaccine?

(a) The vaccine is an excellent one because of the high rate of immunization.
(b) No conclusion is possible since there was no comparison group of non-vaccinated children.
(c) The vaccine is not very effective because it should have produced a higher immunization rate.
(d) No conclusion is possible since no test of statistical significance was performed.
(e) The significant figure is 100% - 80% = 20%, the rate of acquiring the illness.

13, 14 and 15

A screening test for breast cancer was administered to 1000 women with biopsy-proven cervical cancer and to 1000 women without cervical cancer. The test results were positive for 600 of the proven cases and 100 of the normal women. Use these data for the question 13,14 & 15:

13. The sensitivity of the test is:

(a) 40%
(b) 60%
(c) 25%
(d) 90%
(e) 10%

14. The specificity of the test is:

(a) 90%
(b) 80%
(c) 25%
(d) 10%
(e) 12%

15. The Predictive Value for positive test

a) 85.7%
b) 90%
c) 82.5%
d) 70%
e) 99%

Question 16 and 17

An outbreak of gastritis occurred on a cruise ship. The date in table.1 were obtained, shortly after the outbreak, from a questionnaire completed by everyone on board the ship.

	People who Ate Food		People who did not eat	
	Sick	Well	Sick	Well
Cheese	200	800	100	900
Chicken	650	350	100	900
Spinach	200	800	500	500
Bread	300	700	400	600
Chocolate	600	400	450	550

Use the above data for the following questions

16. What is the most likely infective food on the cruise ship?

a) Cheese
b) Chicken
c) Spinach
d) Bread
e) Chocolate

17. What is the relative risk of developing gastritis for Cheese consumption?

a) 0.5
b) 2.0
c) 2.3
d) 8.0

Question 18, 19, 20 and 21 are based on the data available from as cohort study.

A cohort study, with 3000 smokers and 5000 non-smokers was conducted to assess the risk of CHD. The data is given in the following table:

	Develop CHD	Did not develop CHD	Total
Smokers	84	2916	3000

Non-Smokers	87	4913	5000

18. Incidence rate of CHD among Smokers is

    a. 20
    b. 10
    c. 28
    d. 18

19. The Relative Risk is:

    a. 1.6
    b. 1.2
    c. 2.2
    d. 1.0

20. Odds Ratio is

    a. 1.6
    b. 2.0
    c. 3.0
    d. 1.0

21. Attributable Risk is

    a. 37.9
    b. 17.4
    c. 22.0
    d. 42.9

22. Following are the criteria for establishing cause and effect relationship between the risk factor and disease, except:

    a) Dose response
    b) Temporal Community
    c) Strength of Association
    d) Biological Plausibility
    e) Subjective opinion of an expert

23. Community A and community B each have crude mortality rates for coronary heart disease (CHD) of 4 per 1,000. The age-adjusted CHD mortality rate is 5 per 1,000 for community A and 3 per 1,000 for community B. One may conclude that

    a) Community A has a younger population than community B.
    b) Community A has an older population than community B.
    c) The two communities have identical age distribution.
    d) Diagnosis is more accurate in community A than in community B.
    e) Diagnosis is less accurate in community A than in community B.

24. A Case Control study is characterized by all except the following:

a) It is relatively inexpensive
b) Relative risk may be estimated from the results.
c) Incidence rates may be computed.
d) One may select controls without the disease
e) Assessment of past exposure may be biased.

25. When a new treatment is developed that prevents death but does not produce recovery from a disease, the following will occur:

(a) Prevalence of the disease will decrease.
(b) Incidence of the disease will increase.
(c) Prevalence of the disease will increase.
(d) Incidence of the disease will decrease.

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