

UNIVERSITY OF SWAZILAND
FACULTY OF HEALTH SCIENCES

DEPARTMENT OF ENVIRONMENTAL HEALTH SCIENCE
FINAL EXAMINATION PAPER, MAY 2006

COURSE : HSC 303
TITLE OF PAPER : EPIDEMIOLOGY AND COMMUNICABLE DISEASE CONTROL
TIME ALLOWED : 3 HOURS
MARKS : 100

INSTRUCTIONS

1. THIS PAPER HAS SECTION A AND SECTION B
2. ANSWER A TOTAL OF FOUR (4) QUESTIONS
3. WRITE EACH QUESTION ON A SEPARATE SHEET OF PAPER

DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATOR.

SECTION A : EPIDEMIOLOGY

ANSWER TWO (2) QUESTIONS FROM THIS SECTION. QUESTION ONE (1) IS COMPULSORY.

QUESTION 1 (THIS QUESTION IS COMPULSORY)

**A Match each of the following epidemiological statements with the concept it best describes . For example
1 z**

1) Epidemiologic statements	CONCEPT
1 The study of the distribution of health and illness within the population and the factors that determine the population's health status.	a. Descriptive epidemiology
2 The study of the distribution of a given health state in a specified population in terms of person place and time	b epidemiology
3. Involves manipulation of exposure to the supposed causative factor and look for differences in the incidence of the supposed effect	c. case control
4. The client system affected by the particular condition under investigation	d. ecological
5 The primary cause of a health-related condition.	e. cohort
6. Consists of the all living organisms other than humans.	f. experimental
7. Factors related to social interactions that may contribute to health and illness	g. social environment
8 Involves comparisons between persons with a specific condition with without it	h. biological environment
9 Compares rates of disease occurrence among several population groups, usually 10 or more	i. host
10 The study of factors contributing to health states	j agent

Marks.....[10]

B Epidemiology is the science which studies patterns of health and disease in communities and the factors which determine these patterns. Briefly discuss how each of the following factors influence health.

- 1 Cultural factors.....[5]
- 2 Economic factors.....[5]
- 3 Urban-rural differences.....[5]

TOTAL MARKS.....[25]

QUESTION 2

A Following are imaginary population and vital statistics for Community X region for 1997.

Total mid year population	80,000
Population 45 years of age and over	20,000
Number of infants born alive	2000
Fetal deaths	32
Maternal deaths	1
Total deaths	648
Death under 1 year of age	42
Deaths of persons 45 years and over	300
From heart disease	98
From stroke	60
From all other causes	94

From the above data calculate the following indicators of health for Community X applying the usual constant (e.g 1000 or 10,000).

- a. Crude birth rate.....[2]
- b. Crude death rate.....[2]
- c. Infant mortality rate.....[2]
- d. Fetal mortality rate.....[2]
- e. Maternal mortality rate.....[2]
- f. Age specific death rate for persons 45 and over.....[2]
- g. Age cause specific death rate for those 45 and over for
 - (1) heart disease.....[2]
 - (2) cancer.....[2]

B In 1999 Community X with a population of **114000** had **17** cases of acquired immuno deficiency syndrome (AIDS). During the same year Community Y with a population of **1,268,000** had **156** cases of AIDS diagnosed. Compare the rate of AIDS in each community and state why it is important to calculate rates instead of drawing conclusions from raw data.....[4]

C Table 1 shows results from a study of the risk of falls in a 1000 bed acute care hospital during a 1 year period and age specific incidence rates of falls on all hospital services. Study the table and answer the following questions.

1. When falls were examined by service, which service department had the highest number of falls?.....[1]
2. What conclusions can be drawn from data regarding age specific rate of falls per 10000 patient days.....[4]

Table 1 Age specific rates for falls per 10,000 person days					
SERVICE					
Neuro/Psych department			Other clinical departments		
Age group	Falls	Rate	Age group	Falls	Rate
10-19	10	25	10-19	16	21
20-29	34	37	20-29	35	13
30-39	17	19	30-39	38	12
40-49	35	46	40-49	51	19
50-59	46	52	50-59	80	21
60-69	58	64	60-69	144	29
70-79	80	109	70-79	144	42
80+	21	150	80+	51	50

TOTAL MARKS.....[25]

QUESTION 3

A Define each of the following characteristics of infectious agents

- a. toxigenicity.....[1]
- b. virulence.....[1]
- c. pathogenecity.....[1]
- d. infectivity.....[1]
- e. attack rate.....[1]

B Epidemiologists understand that disease results from complex relationships among causal agents, susceptible persons and environmental factors.

Provide at least three examples of the following:

- i) agents.....[3]
- (ii) hosts.....[3]
- (iii) environment.....[3]

C The goal of epidemiology is to identify and understand the causal factors and mechanisms of disease, disability, and injuries so that effective interventions can be implemented to prevent the occurrence of these adverse processes before they begin or progress. Briefly describe the three levels of prevention that provide a framework commonly used in public health practice.

1. primary prevention.....[3]
2. secondary prevention.....[5]
3. tertiary prevention.....[3]

TOTAL MARKS.....[25]

SECTION B: COMMUNICABLE DISEASE CONTROL

Instructions: Answer a total of two questions from this section. Question one (1) is **compulsory**. Choose any other question to make a total of two questions in all.

QUESTION ONE IS (COMPULSORY)

Choose the most correct response using capital letters e.g (1 d)

1. Paratyphoid is caused by the following agent:

- a) Hepatitis A virus
- b) Salmonella paratyphi
- c) Yeasts and fungi
- d) Salmonella typhi
- e) Giardia

2. A typical “pea soup” stool is typical in the following disease:

- 1. Cholera
- 2. Bacillary dysentery
- 3. Typhoid fever
- 4. Amoebic dysentery
- 5. Enteric fever

3. The typical rice- water stool is seen in

- a) Dysentery
- b) Enteric fevers
- c) Diarrhoeal diseases
- d) Cholera
- e) Food poisoning

4. Varicella –zoster virus is a causative agent for which disease?

- A) Small pox
- B) Measles
- C) Chicken pox
- D) Rubella
- E) Viral hepatitis

5. Herpes patients usually give a history of having had the following disease:

- A) Small pox
- B) Leprosy
- C) HIV/AIDS
- D) Chicken pox
- E) Impetigo

6. HIV is transmitted by the following EXCEPT:

- A) By using unsterile instruments to cut or pierce the skin.
- B) Through a transfusion of infected blood.
- C) Unprotected sexual intercourse
- D) From infected mother during pregnancy.
- E) From contaminated eating utensils

7. Muscle stiffness, especially of the face and difficulty in opening the mouth occurs in which disease?

- A) Poliomyelitis
- B) Rabies
- C) Tetanus
- D) Anthrax
- E) Malaria

8. Which amongst the following diseases does the light pink, macular rash, commencing behind the ears, catarrhal inflammation of the eyes and respiratory tract, characterize?

- A Rubella/ German measles
- B Chicken pox
- C Measles/ Morbilli
- D Scabies
- E Impetigo

9. Which of the listed diseases is primarily a disease of the rodent and man is a secondary and accidentally infected?

- A) Bilharzia or Schistosomiasis
- B) Tick-Bite fever
- C) Trypanosomiasis
- D) Plague
- E) Malaria

10. "Hydrophobia" the fear of water is a typical characteristic of:

- A) Viral hepatitis
- B) Poliomyelitis
- C) Tetanus
- D) Rabies
- E) Meningitis

11. Entamoeba histolitica, a pathogenic protozoon is a causative organism for which disease?

- A) Bacillary dysentery (Amoebiasis)
- B) Enteric fevers
- C) Typhoid
- D) Hepatitis B
- E) Hydrophobia

12. B.C.G. vaccine is given at the following age range:

- A) Birth to one month
- B) At 9 months
- C) At 2 to 4 months
- D) At 18 months
- E) At 10 to 12 months

13. DPT is given to children at

- A) 4, 8, and 12 weeks
- B) 6, 10, and 14 weeks
- C) 3, 9, and 12 weeks
- D) 12, 16, and 18 months
- E) 9, 12, and 15 months

14. Measles vaccine is given at

- A) 6 months
- B) 9 months or soon after
- C) 18 months
- D) 8 months
- E) 10 months

15. The intermediate host for schistoma Haematobium that causes urinary bilharzias is:

- A) Fluke
- B) A Bulinus/Physopsis Africanus Species of snails
- C) Wild rodent
- D) Birds
- E) Flea

16. Childhood immunizable disease include all the following EXCEPT in Swaziland.

- A) TB
- B) Measles
- C) Tetanus
- D) Diphtheria
- E) Mumps/ Epidemic Parotitis

17. The most common parasite, the plasmodium of malaria in South Africa and is also the most dangerous type, as it can cause cerebral malaria is:

- A) Plasmodium ovale
- B) Plasmodium Malaria
- C) Plasmodium falciparum
- D) Plasmodium vivax

18. The following disease is described as an infectious disease, on an acute and chronic relapsing nature. A primary lesion, and a secondary eruption, involving the skin, bones, viscera, and central nervous and cardiovascular systems, characterizes it.

- A) Gonorrhoea
- B) Syphilis
- C) Leptospirosis
- D) Relapsing fever
- E) Granuloma Inguinal

19. Which viral disease is characterized by inflammation of the liver and development of jaundice among the listed diseases below?

- A) HIV/AIDS
- B) Hepatitis A and B
- C) Rabies
- D) Influenza
- E) Poliomyelitis

20. Which virus may, during the per-natal period, the first trimester, affect any organ of the fetus, especially the eyes, ears or heart?

- A) HIV
- B) Polio Virus
- C) Rubella Virus
- D) Morbilli Virus
- E) Hepatitis A Virus

21. The following factors are linked with the spread of TB EXCEPT:

- A) Poor housing conditions
- B) Overcrowding
- C) Lack of hygiene
- D) Blood transfusion
- E) Lowered resistance

22. The following definition of “fomites” is the most correct:

- A) Fomites are articles, which have been in contact with an infected source.
- B) Intermediate hosts that have acquired the microorganisms from an infected source.
- C) External parasites which have been in contact with an infected source
- D) Flies which are physically capable of transmitting infection
- E) Bed linen that was used by a person suffering from cancer of the uterus.

23. The reservoir of the pathogenic protozoon (*entamoeba histolitica*) is :

- A) men
- B) cats
- C) donkeys
- D) pigs
- E) all of the above

24. Toxoids are:

- A) Antibodies to tetanus and diphtheria bacteria
- B) Killed micro-organisms
- C) Harmful poisons produced by bacteria
- D) Live, attenuated micro-organisms
- E) Inactive, harmful bacterial toxins

25 The primary prevention of communicable diseases includes the following EXCEPT:

- A) Health education
- B) Personal hygiene
- C) Good standards of nutrition
- D) Food hygiene
- E) Isolation of cases.

QUESTION TWO

Typhoid and paratyphoid fevers are common in less industrialized countries, principally owing to the problem of unsafe drinking water, inadequate sewage disposal and flooding.

Discuss **Typhoid fever** using the following topics:

- A) Incubation period.....[1]
- B) Complications.....[6]
- C) The role of the environmental health officer in the primary prevention level of this disease.....[17]
- D) The causative organism..... [1]

TOTAL.....[25]

QUESTION THREE

AIDS is an illness that impairs the body's ability to fight infection with the result that the body is extremely susceptible to life- threatening diseases.

Utilizing the following headings, discuss this disease.

- A) Reservoir of infection..... [1]
- B) Mention four diseases that are linked with AIDS.....[4]
- C) List the three (3) major signs and three minor signs as defined by WHO for AIDS in Africa.....[6]
- D) Discuss how the spread of HIV/AIDS can be prevented at a community of your choice in Swaziland.....[14]

TOTAL.....[25]