



CHS 334: Epidemiology 1
Final Exam (Students Model)

Time allowed: (2 hours)

Date: / /

الرقم: _____

الاسم: _____

Please write True or False between brackets and correct the false question (s) by underlining the false word(s) and write it (them) under each question. Non corrected false question (s) will be given zero: (marks)

1. Rehabilitation of patients with blindness to enable them to take part in daily social life is an example of Secondary preventive measures.
2. In the epidemiological triad, all host factors are called “extrinsic factors” while the Environmental factors are called “intrinsic factors”. ()
3. Epidemiological studies are qualitative rather than quantitative ()
4. Simple Random and Systematic sampling are probability sampling techniques
5. The screening test is done on patients while the diagnostic test is done on apparently healthy individuals
6. Sensitivity is the ability of a test to identify correctly who truly don't have the disease.
7. Descriptive epidemiology characterizes health events in terms of time, place, and persons affected. ()
8. Ecological studies are experimental studies which use aggregate data on exposure and disease ()
9. Cohort studies are called incidence studies and begin with diseased persons ()
10. When the sample is representative, its results cannot be generalized to the population ()
11. The results of a sample collected by a simple random or systematic sampling can not be generalized to the population ()
12. Stratified Sampling is a probability sampling technique while Convenience sampling is a non probability sampling technique
13. Out-migration of healthy individuals decreases disease prevalence rate ()
14. The results in the screening test are conclusive and don't require confirmation ()
15. Infant mortality rate is a fertility statistic while crude birth rate is a mortality statistic ()
16. During point source epidemics, cases are clustered within a short time. ()
17. Vehicle-borne and Vector-borne are direct modes of transmission ()
18. Sensitivity is the ability of a test to identify correctly who truly have the disease. ()
19. All diseases are suitable for screening program ()
20. The screening test is applied to a group of individuals while the diagnostic test is applied to a single person

Please circle the correct answer:

(marks)

1. The use of volunteers is an example of:
 - a) Convenience Sampling
 - b) Proportional quota sampling
 - c) Snowball Sampling
 - d) Extreme case sampling
2. A state of complete physical, mental, and social well-being of the community is called:
 - a) Public Health
 - b) Pathogenicity
 - c) Epidemiology
 - d) Infection
3. The type of sampling, where either students with grade A+ will be sampled is:
 - a) Convenience
 - b) Proportional quota
 - c) Snowball
 - d) Extreme case
4. It is an interval between the appearance of the first case till the appearance of the last one.
 - a) peak time
 - b) Time distribution
 - c) Secular change
 - d) Seasonal fluctuation
5. Which of the followings is considered a time distribution of a disease:
 - a) Pathogenicity
 - b) Infectivity
 - c) Secular change
 - d) Analytical epidemiology
6. It means that the experimental subject, investigator or both do not know different treatments being provided until after completing the study
 - a) Blinding
 - b) Placebo
 - c) Experimental study
 - d) Complement
7. Suppose we have 100 persons and we want to take 20 persons as a sample, what will be the sampling approach:
 - a) Simple Random sampling with a sampling interval of 10 persons
 - b) Simple Random sampling with a sampling interval of 5 persons
 - c) Systematic sampling with a sampling interval of 5 persons
 - d) Systematic sampling with a sampling interval of 10 persons
8. A preventive measure aims to diagnose and treat diseases before they become advanced and disability becomes severe
 - a) Primary
 - b) Convalescence
 - c) Secondary
 - d) Tertiary
9. The type of the Randomized controlled trials is:
 - a) Experimental
 - b) Descriptive
 - c) Analytical

- d) Prevalence
10. The study used to correlate daily meat consumption of the population and rate of colon cancer in women
- a) Case control study
 - b) Historical cohort study
 - c) Ecological study
 - d) Cohort study
11. An epidemic spreading over several countries or continents is called:
- a) Sporadic
 - b) Endemic
 - c) Hyperendemic
 - d) Pandemic
12. Birth data is essential for calculating the following rates **except**
- a) Crude death rate
 - b) Infant mortality rate
 - c) Crude fertility rate
 - d) Maternal mortality rate
13. If you want to take a sample of 10 from 100 diabetic patients (30 males and 70 females), the best sampling approach is:
- a) Simple Random
 - b) Systematic
 - c) Stratified
 - d) Cluster
14. Infectious diseases transmissible under natural conditions from animals to humans are called:
- a) Zoonoses
 - b) Anthroponoses
 - c) Histoplasmosis
 - d) Infectivity
15. Number of deaths in children (under 1yr age) in a certain year and certain locality/ Number of live births for the same year and same locality x1000 is the:
- a) Infant Mortality Rate
 - b) Crude birth rate
 - c) Crude Death Rate
 - d) Age-Specific Death Rate

16. Suppose we have 1000 persons and we want to take 200 persons as a sample using systematic approach, the sampling interval will be:
- 5 persons
 - 50 persons
 - 100 persons
 - 200 persons
17. Which of the followings ***is not*** a characteristic of the health screening test
- Done to apparently healthy or asymptomatic individuals
 - Applied to a group of individuals
 - Results are not conclusive
 - A basis for treatment

Please fill the empty space with the correct word (s): (marks)

- is a phase of infectious diseases where the typical signs and symptoms of the diseases are present
- are not direct causes of diseases, but they increase susceptibility of at-risk individuals to a disease.
- One of the most important secondary prevention measures is -----
- Vital statistics are (1) -----, (2) -----, (3) -----, (4) -----, (5) -----.
- Pattern refers to occurrence of health-related events by: (1) -----, (2) -----and (3) -----.
- In a population of 10 000 people contained 500 women aged 15-49 years and 50 of these women had live babies in the year 2004, when these babies reached 9 months 5 of them died.
 - Calculate the followings:**
 - Crude birth rate = $(50 \text{ live births} / 10\ 000 \text{ total people} \times 1000) = 5 \text{ births per } 1000 \text{ population}$
 - Crude Fertility Rate = $(50 \text{ live births} / 500 \text{ women aged } 15\text{-}49 \text{ years} \times 1000) = 100 \text{ births per } 1000 \text{ women aged } 15\text{-}49 \text{ years}$
 - Infant Mortality Rate = $(5 \text{ infant deaths} / 50 \text{ live births}) = 100 \text{ deaths per } 1000 \text{ live births}$
- Ten cases of food poisoning occurred among 100 children attending a childcare center. Each infected child came from a different family. The total number of persons in the 10 affected families was 70 including the affected children. After two days, 12 members of these 10 families developed food poisoning.
 - Calculate the followings:**
 - Attack rate in childcare center** = cases of food poisoning among children in the center/ total number of children in the childcare center = $10/100 \times 100 = 10\%$
 - cases of food poisoning among family contacts of the affected = 12 cases**
 - number of persons at risk of developing food poisoning in the families=** (total number of family members–children already infected) = $70 - 10 = 60$ members
 - Secondary attack rate** = $12/60 \times 100 = 20\%$
- Relative Risk (Risk ratio)** = Incidence among exposed (Ie)/ Incidence among non exposed (I0)

9. **Attributable risk percent**= (incidence rate of a disease among exposed - incidence rate among non exposed) / incidence rate of a disease among exposed x 100

The following table shows the results of a case- control study investigating the correlation between hypertension and salt consumption

	Hypertension Patients	Control	Total
High salt diet	180	20	200
Low salt diet	40	200	240
Total	220	220	440

Find the followings:

- Exposure rate of high salt diet among hypertensive patients = $\frac{\text{NO. exposed among cases}}{\text{total NO. cases}} \times 100 = \frac{180}{220} \times 100 = 82\%$
- Exposure rate of high salt diet among normotensive controls = $\frac{\text{NO. exposed among controls}}{\text{total NO. controls}} \times 100 = \frac{20}{220} \times 100 = 9\%$
- Interpretation of the results
frequency of high salt diet among cases is more than among controls
- Odds ratio
Odd that a case is being exposed/Odd that a control is being exposed= $\frac{(180 \times 200)}{(40 \times 20)} = 45$
- Interpretation of the odds ratio
Those with high salt diet are 45 times at risk to have hypertension than those with low salt diet

10.
11.

The following table shows the results of a cohort study investigating the correlation between hypertension and salt consumption

	Hypertension Patients	Normotensive	Total
High salt diet	180	20	200
Low salt diet	40	200	240
Total	220	220	440

Find the followings:

- incidence of hypertension among those on high salt diet
 $\frac{\text{NO cases}}{\text{total NO of those on high salt diet}} \times 100 = \frac{180}{200} \times 100 = 90.0$
- incidence of hypertension among those on low salt diet
 $\frac{\text{NO cases}}{\text{total NO of those on low salt diet}} \times 100 = \frac{40}{240} \times 100 = 16.7$

Relative Risk (Risk ratio) = $\frac{\text{Incidence among exposed (Ie)} / \text{Incidence among non exposed (Io)}}{90/17} = 5.4$

Interpretation of Relative Risk Those on high salt diet are five times at greater risk of developing hypertension than those on low salt diet

Attributable risk percent difference between incidence rate of a disease among exposed (Ie) and that among non exposed (Io)/ incidence rate of a disease among exposed x 100=
 $(90-16.7)/90 \times 100 = 81.5$

Interpretation of Attributable risk percent 81.5 of hypertension among those on high salt diet is due to high salt diet
 12.

The following table shows number of live births to women with during 2010 in two cities City "A" and City "B"

Age groups (years)	Mid-year population		Number of female		Number of live births	
	City "A"	City "B"	City "A"	City "B"	City "A"	City "B"
Less 10	12536	17546	6435	8763	0	0
10-	11980	16480	5674	9874	23	45
15-	22443	24675	10875	10933	1235	1132
20-	24567	29821	10435	14536	1435	1790
30-	34508	42514	18756	24568	2034	2655
40-	17825	22665	8776	11596	765	987
50-	11305	16233	7654	9867	230	434
60 and more	10736	12366	6595	7863	3	7
Total	145900	182300	75200	98000	5725	7050

Please find the followings

Crude birth rate in City "A"/1000 population = $(\text{Number of live births}/\text{Mid-year population}) \times 1000$ population in City "A" = **39.2**

Total Number of females in the reproductive age in City "A" = females in the age groups from 15- to 40- in City "A" = **48842.0**

General (crude) Fertility Rate/ 1000 females in City "A" = Number of live births/Mid-year female population (15-49 years) x 1000 = **117.2**

Age-Specific Fertility Rate/ 1000 females (30-39 years) in City "A" = Number of live births born to females 30-39 years /Mid-year females 30-39 years in City "A" x 1000 = **108.4**

Age-Specific Fertility Rate/ 1000 females (40-49 years) in City "A" = Number of live births born to females 40-49 years /Mid-year females 40-49 years in City "A" x 1000 = **87.2**

13.

The following table compares a results of a screening test and a golden test for diagnosis of cervical cancer			
Screening test (cervical smear)	Gold standard (Surgical biopsy)		Total
	Cancer	No cancer	
Positive	38	12	50
Negative	7	123	130
Total	45	135	180

Find the following

sensitivity of the screening test=

$$\frac{\text{True positive}}{\text{True positive} + \text{false negative}} \times 100$$

84.4

specificity of the screening test=

$$\frac{\text{True negative}}{\text{True negative} + \text{false positive}} \times 100$$

91.1

prevalence of the disease/ 100 persons=

$$\frac{\text{NO of cases}}{\text{total NO of persons}}$$

25.0%