

Participant's Names: \_\_\_\_\_  
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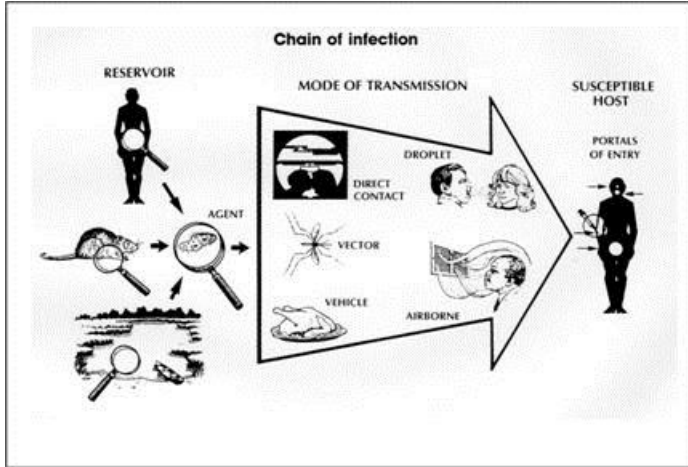
## **Part 1: Epidemiological terminology**

- a. Define the following terms: (award 2 points for each word that is defined correctly)
1. Fomite: a physical object that serves to transmit an infectious agent from person to person
  2. Vector: An animate intermediary in the indirect transmission of an agent that carries to the agent from a reservoir to a susceptible host
  3. Zoonosis: An infectious disease that is transmissible from animals to humans
  4. Epidemic: large numbers of people over a wide geographic area affected
  5. Outbreak: (localized epidemic) more cases of a particular disease than expected in a given area or among a specialized group of people over a particular period of time.
  6. Cluster: an aggregation of cases over a particular period closely grouped in time and space regardless of whether the number is more than the expected number
  7. Surveillance: The systematic, ongoing collection, analysis, interpretation and dissemination of health data.
  8. Etiology: The origin of disease
  9. Pathogen: A disease causing agent
  10. Virus: a nonliving, disease causing agent that specifically attacks cells of the body

## **Part 2: Epidemiological concepts**

- a. List the ten steps of an outbreak: (1 point for each step that is correctly identified)
1. Prepare for field work
  2. Establish the existence of an outbreak
  3. Verify the diagnosis
  4. Define and identify cases
  5. Describe and orient the data in terms of Time, Place and Person
  6. Develop Hypotheses (agent/host/environment triad)
  7. Evaluate hypothesis
  8. Refine hypothesis and carry out additional studies
  9. Implement control and prevention measures
  10. Communicate finding
- b. Illustrate and describe the chain of infection:

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- c. List the components of the epidemiological triad: (1 point for each correctly identified component)
1. agent
  2. host
  3. environment
- d. Describe the following types of biases: (3 pts. Each)
1. Selection bias: occurs when study subjects are selected for the study as a result of a third unmeasured variable which is associated with both the exposure and the outcome.
  2. Recall bias: In a case control study, patients do not remember exposures that they do not believe caused the disease as well as those they believe did cause it (cases) and they don't recall some exposures as clearly as cases (controls)
  3. Information bias: Occurs from systematic error in the assessment of a variable
- e. Explain what study the epidemiologists are utilizing: (3pts each)
1. Epidemiologists identify a population that is exposed to a suspected carcinogen and a non-exposed population and track them to determine who develops leukemia.

**Cohort study**

2. Switzerland is determined to have a higher breast cancer incidence and a higher consumption of dietary fat when compared with other countries.

**Ecological study**

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- Epidemiologists are interested in the possible relationship involving increased serum cholesterol level (exposure) to electrocardiographic (ECG) evidence of CHD (the disease). They survey a population; for each participant they determine the serum cholesterol level and perform an ECG subsequently for evidence of CHD.

**Cross-sectional study**

**Part 3: Epidemiological application**

- Infectious disease are more likely to be distributed to others in a larger population: (2 pts.)      **True**      False
- List 5 types of bacteria and the disease they produce in humans in the table below. (Answers may vary, any type of bacteria and correctly associated disease receives 1 pt.)

Bacteria	Disease
1.	
2.	
3.	
4.	
5.	

- Give two reasons why bacterial diseases tend to affect larger populations. (2 pts./1 for each)

Must discuss modes of transmission

- Pick one of the diseases you listed above and explains specifically how it affects larger populations and why. (answers may vary, 3pts)

**Part 4: Multiple choice (2pts. Each)**

- In cohort studies of the role of a suspected factor in the etiology of a disease, it is essential that:

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- a. There be an equal number of persons in both study groups
  - b. At the beginning of the study, those with the disease and those without the disease have equal risks of having the factor
  - c. The study group with the factor and the study group without the factor be representative of the general population
  - d. The exposed and non-exposed groups under study be as similar as possible with regard to possible confounding factors
  - e. Both b and c
2. Which of the following is not an advantage of having a prospective cohort study
- a. It usually costs less than a case control
  - b. Precise measurements of exposure is possible
  - c. Incidence rates can be calculated
  - d. Recall bias is minimized compared to a case control study
  - e. Many disease outcomes can be studied simultaneously
3. A major problem resulting from the lack of randomization in a cohort study is:
- a. The possibility that a factor that led to the exposure, rather than the exposure itself might have caused the disease
  - b. The possibility that a greater proportion of the people in the study may have been exposed
  - c. The possibility that a smaller proportion of people in the study may have been exposed
  - d. That, without randomization, the study may take longer to carry out
  - e. Planned crossover is more likely
4. A case control study is characterized by all of the following except:
- a. It is relatively inexpensive compared with most other epidemiologic study designs
  - b. Patients with the disease (cases) are compared with persons without the disease (controls)
  - c. Incidence rates may be computed directly
  - d. Assessment of past exposure may be biased
  - e. Definition of cases may be difficult
5. In a case-control study, which of the following is true?
- a. The proportion of cases with the exposure is compared with the proportion of controls with the exposure
  - b. Disease rates are compared for people with the factor of interest and for the people without the factor of interest
  - c. The investigator may choose to have multiple comparison groups
  - d. Recall bias is a potential problem
  - e. a, c, and d
6. In which of the following types of study designs does a subject serve as his own control
- a. Prospective cohort study
  - b. Retrospective cohort study
  - c. Case-control study
  - d. Case-crossover study

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- e. Case-cohort study
- 7. Ecological fallacy refers to:
  - a. Assessing exposure in large groups rather than in many groups
  - b. Assessing outcome in large groups rather than in small groups
  - c. **Ascribing the characteristics of a group to every individual in that group**
  - d. Examining correlations of exposure and outcomes rather than time periods
  - e. Failure to examine temporal relationships between exposures and outcomes

**Part 5: Epi graph, statistics and advanced epidemiology**

- a. Create an epidemic graph using the information in the following table. Label the axis and indicate the point of onset and outbreak. (10 pts. For epi graph)

Time	Number of cases
8/29/2014	2 POINT OF ONSET
8/30/2014	2
9/2/2014	12
9/5/2014	16
9/12/2014	18 OUTBREAK
9/13/2014	12
9/16/2014	6
10/24/2014	2
10/25/2014	0

<b>NUMBER OF CASES</b>	18					----				
	16					-----	----			
	14					-----	----			
	12			-----	-----	----	----			
	10			-----	-----	----	-----			
	8			-----	-----	----	-----			
	6			-----	-----	----	-----	-----		
	4			-----	-----	----	-----	-----		
	2	-----	-----	-----	-----	-----	-----	-----	-----	
	8/29	8/30	9/2	9/5	9/12	9/13	9/16	10/24	10/25	
	<b>TIME</b>									

- b. Calculate odds ratio for this exposure using the following data (show your work). (5 pts.)

	Case	Control
Exposed	12	15
Unexposed	13	10

AD/BC:  $(12 \cdot 10) / (13 \cdot 15) = 0.62$

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- c. In an outbreak or an epidemic, evidence is accumulated linking disease to a causative organism or substance. What is the name of the criteria used to prove that an organism causes a disease? (3 pts. Tie breaker)

**Bradford Hill Criteria**

- d. Fill in the missing parts of the table: (5 pts. Tie breaker)

Food	Cases				Controls			
	Ate	Did not eat	Total	% Ate	Ate	Did not eat	Total	% Ate
Ham	29	17	46	<b>63.04</b>	17	12	<b>29</b>	58.62
Cake	27	19	46	<b>58.70</b>	<b>13</b>	<b>16</b>	29	44.83
Milk	2	<b>44</b>	46	4.35	2	27	29	<b>6.90</b>
Rolls	<b>21</b>	25	46	45.65	<b>16</b>	<b>13</b>	29	55.17