Disease Detectives Test

Created by SOnerd for the 2015 SSSS. This test is designed for Division B, but can also be used with Division C competitors.

Section 1- Vocabulary

This section will test your knowledge of vocabulary terms used in the field of epidemiology. Different question formats are used to ensure complete understanding of certain terms.

Part 1- Definitions

Define the following words:

1. Cluster-

2. Contagious-

3. Etiology-

4. Hyperendemic-

5. Index Case-

6. Susceptible Host-

7. Vaccine-

8. Zoonosis-

Part 2- Compare/Contrast

You will be given 5 groups of words. Each group will contain 2-3 different words. Under the words, please **explain the differences between them**. For example, in Group 1 you will explain how epidemics, pandemics, and outbreaks are different. You may provide a definition of each word if it helps you, but remember that you also must explicitly state how they are different from each other. Feel free to use drawings or other visual aids if they are necessary to convey your point.

Group 1-

Epidemic, Pandemic, and Outbreak

Group 2-

Fomite, Vector, and Vehicle

Group 3-
Epidemic Curve, Line Listing (NOTE- if you choose to use diagram(s) for this section, they must have an explanation)

Group 4-
Symptom, Sign

Group 5-
Quarantine, Isolation-

Part 3- Complete the following sentences with the most logical vocabulary word:

1) A (n)_____ is a person or animal without apparent symptoms of disease who harbors an infectious agent and can transmit it to others.
2) After becoming infected with Ebola, Sammy did not show signs or symptoms of the disease until about 21 days later. This period of time is known as the disease's _____.
3) A(n)_____ is any substance that is recognized as foreign by the human body and triggers the production of antibodies.
4) A(n) _____ is any variety of proteins in the blood that are produced in response to an antigen.
5) If a disease is constantly present in a given population, it is considered to be _____.
6) Much like how rapid population growth can cause an epidemic in humans, it can cause a(n) _____ ____in animals.
7) The three forms of _____ are bubonic, septicemic, and pneumonic.
8) A(n) _____ is any factor that brings about change in a health condition or in other defined characteristics

Part 4- Match the following terms with their characteristics:

A) Bacteria
B) Fungus
C) Virus
D) Prion
E) Parasite
F) Virophage
G) Bacteriophage
H) Pathogen
I) Agent

1) An organism that lives on or in a host and gets its food from or at the expense of its host
2) A virus that infects bacteria
3) Microscopic, single-celled disease-causing agents that lack chlorophyll and nuclei
4) A small proteinaceous infectious disease-causing agent that is believed to be the smallest infectious particle. They are neither bacterial nor fungal nor viral and contain no genetic material.
5) Any agent that causes disease, including bacteria, viruses, fungi, etc.
6) A virus that infects other viruses
7) Nonmotile, filamentous organisms that cause diseases that can be very difficult to cure. They are either singlecellular or multicellular
8) A nonliving disease causing agent that is only able to multiply inside the cells of host
9) A factor or form of energy whose presence, excessive presence, or in the case of deficiency diseases, relative absence is essential for the occurrence of a disease or other adverse health outcome

A) __
B) __
C) __
D) __
E) __
F) __
G) __
H) __
I) __

Section 2- Statistics & Data Collection

Part 1- Graph
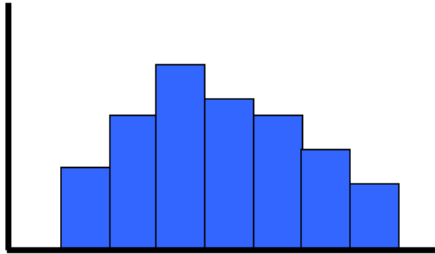
1. In Epidemiology, this type of graph is known as a(n) _____.
2. The y-axis of this graph tells you _____.
3. The x-axis of this graph tells you _____.
4. Which of the following is an appropriate title for this type of graph?
    A) Outbreak of Disease in New York City
    B) Cholera Cases by Date of Onset in New York City, January 2000-December 2000
    C) Cholera Spread Patterns
    D) Diseases in New York City from January 2000 to December 2000
5. Name the three most common types of this graph. _____, _____, and _____.
6. Three graphs are shown. Label each one as the correct type. Use your answers to question #5 as a word bank.
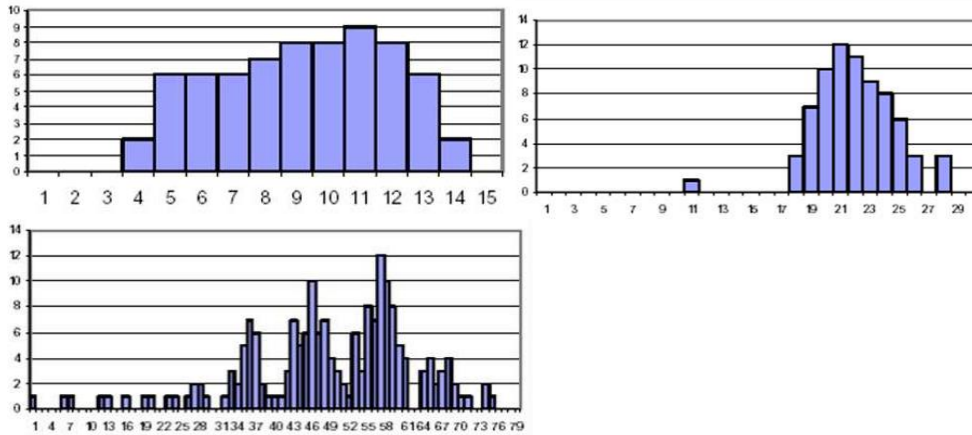
7. What are 4 things that this type of graph can tell you about an outbreak?

Part 2- Calculations (Div B only, no C-level stats)

Create a two-way table based on the following data.

200 total people attended a dinner party. At the party, there was a salad that was suspected to have been the cause of a sudden spread of sickness among party attendees. Of the 200 total people at the party, 137 reported eating the salad. Of those 137 people, 98 became ill. Out of the people who did not eat the salad, only 20 became ill.

8. Based on your table, calculate the relative risk. _____

9. What is the purpose of calculating relative risk, in general?

10. What does a relative risk of greater than one indicate?

11. What does a relative risk of less than one indicate?

12. In this situation, why was using relative risk a better choice than odds ratio?

13. What is the formula for calculating odds ratio?

14. How is prevalence calculated? Incidence?

15. What is the difference between prevalence and incidence?

Section 3- Study Types

Part 1- Fill in the blank
For this section, use this as a word bank:

Case-Control   Cohort   Cross-Sectional   Ecological

1. _____ is based off exposure status.
2. _____ is also known as a survey.
3. _____ uses the odds ratio to calculate relevant data.
4. _____ uses relative risk to quantify the relationship between exposure and disease.
5. _____ is based off of disease status.
6. _____ is used within a small, well-defined population.
7. _____ compares groups of people to determine the cause of a disease.

Part 2- Taxonomy of study types
1. What does it mean when a study has **forward directionality**? **Backwards Directionality**?

2. Indicate whether the following types of studies have **forward directionality** or **backwards directionality.** (write F or B)
   a. Case-Control
   b. Randomized Control
   c. Cohort

3. What type of data is generally provided by **analytic** studies? **Descriptive** studies?

4. Indicate whether the following types of studies are **analytic** or **descriptive**. (write A or D)
   a. Cohort
   b. Case-Control
   c. Randomized Control

      d. Ecological

      e. Case Report/Series

5. _____ studies are used to generate hypotheses, while _____ studies are used to test hypotheses.

6. What is the difference between a **retrospective study** and a **prospective study**?

7. Indicate whether the following types of studies are **retrospective** or **prospective**. (write R or P)

      a. Cohort

      b. Case-Control

      c. Randomized Control

Part 3- Pros and Cons of Study Designs

List 2 pros and 2 cons of each study type.

1. Cohort

Pros	Cons

2. Ecological

Pros	Cons

3. Cross-Sectional

Pros	Cons

4. Case-Control

Pros	Cons

Section 4- Epidemiology Practice & General Epidemiology

Part 1- Famous Figures of Epidemiology
Match each person's name with their significance.

A) John Snow
B) John Gaut
C) Joseph Lister
D) Gerhard Hansen
E) Girolamo Fracastoro
F) Robert Koch
G) Louis Pasteur
H) Sir David Bruce
I) William Farr

1) A French chemist and microbiologist renowned for his discoveries of the principles of vaccination, microbial fermentation and pasteurization
2) The first to propose a theory that these very small, unseeable, particles that cause disease were alive
3) Listerosis, a bacterial infection is named after him
4) A nineteenth-century British epidemiologist, regarded as one of the founders of medical statistics.
5) Published Political Observations Made upon the Bills of Mortality; developed stats
6) Brucellosis, a highly contagious bacterial disease named after him
7) Established four criteria to identify the causative agent of a particular disease
8) Used a systematic study to end the cholera outbreak; Father of modern epidemiology
9) Identified the bacterium that causes leprosy

A) __
B) __
C) __
D) __
E) __
F) __
G) __
H) __
I) __

Part 2- Miscellaneous
Concisely list the ten steps for controlling an outbreak.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. Relating the 10 Steps to the Scientific Method- Tell which step (just write numbers) from above relates to the following parts of the Scientific Method.
    a. Obtain background information-
    b. Define the problem-
    c. Formulate hypothesis-
    d. Develop a study to test the hypothesis-
    e. Collect data and observations-
    f. Evaluate results-
    g. Determine if a hypothesis is true/modify-
    h. Formulate conclusions-
    i. Report results-

12. Name and define the three characteristics of an agent.
    a. _____-_____
    b. _____-_____
    c. _____-_____

13. What are Hill's Criteria for Causation used for?

14. Concisely list all 9 Criteria (1-2 words is sufficient)
    a. _____
    b. _____
    c. _____
    d. _____
    e. _____
    f. _____
    g. _____
    h. _____
    i. _____

15. What are Koch's Postulates used for?

16. Concisely list the 4 Postulates
    a. _____
    b. _____
    c. _____
    d. _____

17. Name the three components of the epidemiological triad. _____ _____ _____

18. Name the three components of the chain of transmission triad: _____ _____ _____

19. What is a case definition?

20. Name the three most important elements of a case definition.

_____ _____ _____

21. Concisely list the six elements of the Chain of Infection.

    a. _____

    b. _____

    c. _____

    d. _____

    e. _____

    f. _____

Section 5- Disease Prevention & Modes of Transmission

1. Fill in the table appropriately.

Mode of Transmission	3 Basic Ways to Prevent Spread (not specific to individual diseases)
Droplet Spread	
Mosquito-Borne	
Food-Borne	
Fecal-Oral	

2. Define the following types of prevention:
    a. Primary Prevention:

    _____

    b. Secondary Prevention:

    _____

    c. Tertiary Prevention:

    _____

    d. Quaternary Prevention:

    _____

3. Indicate the mode of transmission for each disease:
    a. Anthrax = _____
    b. Brucellosis = _____
    c. Mumps = _____
    d. Ebola = _____
    e. Smallpox = _____
    f. Measles = _____
    g. Chicken Pox = _____

Section 6- Tiebreakers!

Answer as few or as many as you like, these will be used as tiebreakers (first question is first tiebreaker, etc)

1. What are the four types of data collected by epidemiologists?

2. Define:
    a. Metazoa-
    b. Morbidity-
    c. Mortality-
    d. Mycology-
    e. Null Hypothesis-
    f. Penicillin-
    g. Herd immunity-
    h. Public Health Survellance-
    i. Infection-
    j. Histamine-
    k. Contingency Table-
    l. Bimodal-
    m. Asymmetrical-
3. Name factors leading to the emergence of infectious diseases