

Team Number: _____

School Name: _____

Student Names: _____

Disease Detectives – C
Clio High School Invitational
January 26th, 2013



Exploring the World of Science

Part I: Matching

Please match each word to its definition. Mark all answers on your answer sheet.

- | | |
|-------------------------------|--|
| 1. Agent | A. a widespread outbreak of an infectious disease in a specified community |
| 2. Bacteria | B. system of doctors and health officials collecting and comparing data on various diseases or infections within communities |
| 3. Epidemic | C. ultramicroscopic infectious agent that replicates itself only within cells of living hosts |
| 4. Outbreak | D. an organism that transmits a pathogen |
| 5. Virus | E. a disease causing agent |
| 6. Symptom | F. invasion of the body by pathogenic agents |
| 7. Public Health Surveillance | G. a substance that causes an effect |
| 8. Exposure | H. an inanimate object that can be used in the transmission of diseases |
| 9. Infection | I. time of the appearance of the first symptoms of an illness |
| 10. Pathogen | J. any disease of animals communicable to humans |
| 11. Pandemic | K. microscopic, single-celled organisms that lack chlorophyll and nuclei |
| 12. Onset | L. a sudden occurrence of disease in two or more people during a specified period of time |
| 13. Vector | M. a disease that occurs over a wide geographic area and affecting an exceptionally high proportion of people |
| 14. Zoonosis | N. to come in contact with an infectious agent in a manner that promotes transmission and the likelihood of disease |
| 15. Fomite | O. evidence or sign of disease or infection |

Part II: Multiple Choice

Please choose the response that best answers the question. Mark all answers on your answer sheet.

16. Which of the following is an epidemiological triad?
 - a. time/person/symptoms
 - b. person/place/pathogen
 - c. agent/host/place
 - d. agent/host/environment

17. Which of the following can modify the effects of environmental exposures for individuals?
 - a. genes/genetics
 - b. physical condition
 - c. emotional condition
 - d. only a and b
 - e. a, b, and c

18. A case of influenza or influenza-like illness is defined as
 - a. a person with coughing, sneezing, and/or a runny nose
 - b. a person with a fever over 37.8 °C
 - c. a person with a fever over 38.5 °C plus sneezing during the flu season
 - d. a person with a fever over 37.8 °C plus coughing during the flu season

19. Case definitions are established with these four components:
 - a. clinical information, characteristics of affected people, place, time sequence
 - b. clinical information, characteristics of disease, place, time sequence
 - c. lab reports, characteristics of disease, place, time sequence
 - d. lab reports, characteristics of affected people, place, time sequence
 - e. none of the above

20. Which of the following are potential types of errors in data collection?
 - a. computer-generated error
 - b. random error
 - c. domain error
 - d. causal error

21. Lead contamination, air pollution, and water pollution have what in common?
 - a. they are all types of pollution
 - b. they can cause health problems
 - c. both a and b
 - d. neither a nor b

22. A non-causal relationship is a type of error in data collection.
 - a. true
 - b. false

Part III: Short Answer

Answer each question to the best of your ability. Please mark all answers on your answer sheet.

List the ten steps of an outbreak investigation.

- 23.
- 24.
- 25.
- 26.
- 27.
- 28.
- 29.
- 30.
- 31.
- 32.

List the nine criteria that can be used to prove causation (Hill's criteria for causation).

- 33.
- 34.
- 35.
- 36.
- 37.
- 38.
- 39.
- 40.
- 41.

Part IV: Outbreak Scenario

Please show all work for calculations and record all answers on your answer sheet. Round all solutions to two decimal places.

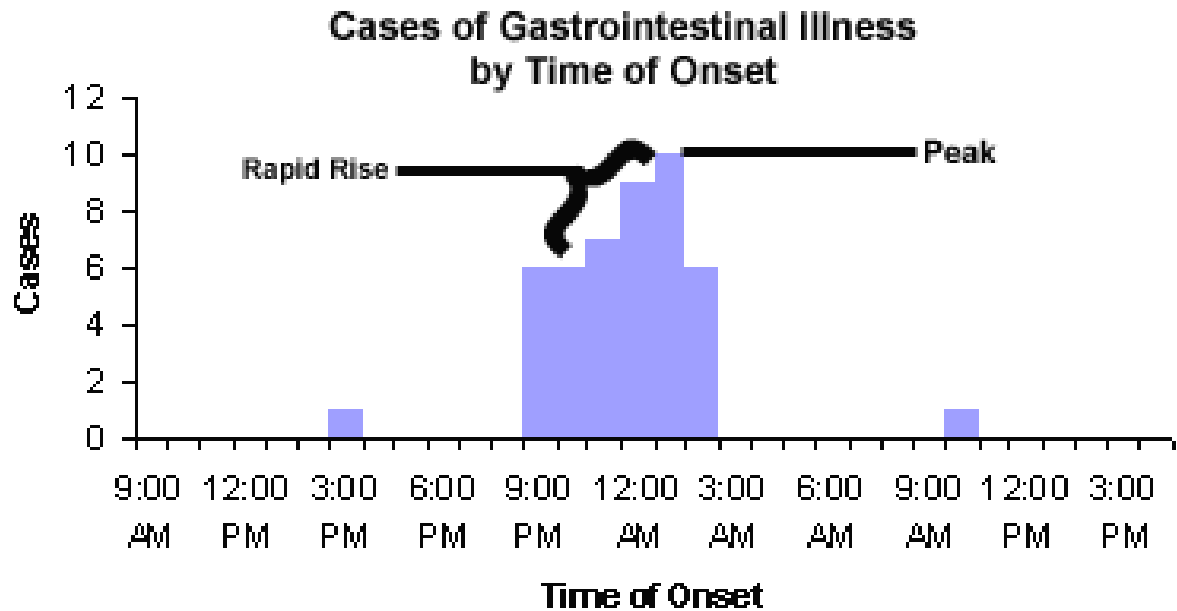
An outbreak of severe stomach illness occurred following a graduation party. Disease detectives took up the challenge to investigate the problem and obtained the following data of association of specific food eaten at the party and having the illness.

Food	Cases				Controls			
	Ate	Did Not Eat	Total	%Ate	Ate	Did Not Eat	Total	%Ate
Baked Ham	29	17	46	63.04	17	12	29	58.62
Spinach	26	20	46	56.52	17	12	29	58.62
Mashed potatoes	23	23	46	50.00	14	15	29	48.28
Jello	16	30	46	34.78	7	22	29	24.14
Rolls	21	25	46	45.65	16	13	29	55.17
Cake	27	19	46	58.70	13	16	29	44.83
Ice cream	43	3	46	93.48	11	18	29	37.93
Milk	2	44	46	4.35	2	27	29	6.90
Water	13	33	46	28.26	11	18	29	37.93

42. Which food has the highest risk associated with it?
43. Which food had the lowest risk associated with it?
44. Calculate the relative risk of the food with the highest risk.
45. Calculate the percentage of those who ate food and then developed illness.
46. Calculate the attack rate for those who ate mashed potatoes.
47. Calculate the odds ratio for those who ate ice cream.
48. How many people were at the party?

Part V: Epi Curves

Analyze the given epi curve and answer the questions to the best of your ability. Mark all answers on your answer sheet.



49. What is the time of onset of the first case?
50. What type of epi curve is this and why?
51. The peak number of cases is?
52. Using the epi curve, estimate the incubation period.