

Team Name/Number: _____

Names of Team Members: _____

Section 1 - Short answer questions on knowledge of epidemiology terms and concepts. (Each question is worth 2 points)

1. Name the three components of the epidemiological triad.
2. Define the term "host" and name the three classifications of hosts.
3. What are the three pieces of data used to characterize the outbreak of a disease or health situation?
4. What do epidemiologists call the histogram that shows the course of an outbreak of a disease which helps identify the source of exposure?
5. What are the four elements of the chain of transmission?
6. What does a case definition determine?
7. What are the three types of case definitions which help in identifying specific cases?
8. What are the four components/criteria of a case definition?
9. Name the three types of outbreaks characterized by using Epidemic (Epi) Curves.
10. Define the term "indirect transmission."
11. Name the 3 modes of indirect transmission and give one example of each mode.
12. Name the three types of descriptive studies that may be used in an outbreak investigation.
13. What must an epidemiologist have to validate a hypothesis?
14. What are two types of analytical studies used to evaluate a hypothesis?
15. Define retrospective study.
16. Define prospective study.
17. What is required for both a cohort and a case-control study?

Team Name/Number: _____

Names of Team Members: _____

18. In an outbreak or epidemic, epidemiologists gather data to study cause and effect relationships associated with the disease. What is the name of the “criteria” used to study these cause/effect relationships?

19. List 3 of the 5 criteria identified in Question #18.

20. Show the formula for calculating “relative risk” and explain what is it used to evaluate.

21. Show the formula for “odds ratio” and explain what it is used to evaluate.

22. Define zoonosis and name a specific disease that may be transmitted in this manner.

23. Define fomite and provide a specific example of this type of transmission.

Section 2 – Provide the term for each definition. (Each question is worth 2 points)

24. A disease causing organism.

25. An infectious agent that cause diseases; it must have a suitable host to reproduce.

26. An outbreak occurring over a wide area (possibly countries or continents) and in large part of the population.

27. This is a localized epidemic, there are more cases of a disease in a given area or specialized group than is expected during a particular period of time.

28. The probability that an individual will be affected by or die from an illness or injury within a stated time or age span.

29. An outbreak of an illness or disease affecting large numbers of people and generally over a wide geographic area.

30. What is the systematic, ongoing collection, analysis, interpretation, and dissemination of health data used to gain knowledge of the patterns of disease, injury etc.

31. What is the animate intermediary in the indirect transmission of an agent; it carries agent from reservoir to a susceptible host.

32. Organisms that can grow in the presence of atmospheric oxygen.

33. A person or animal without apparent symptoms of disease who harbors an infectious agent and can transmit it to others.

Team Name/Number: _____

Names of Team Members: _____

34. This type of epidemiology characterizes health events in terms of time, place, and person.
35. What does the body produce when lymphocytes encounter an allergen.
36. An organism that lives on or within another living organism (the host).
37. A site, alternate host, or carrier that harbors an infectious agent and serves as a source from which others can be infected.

Section 3 – Fill in the blank. (Each question is worth 2 points)

**General food safety facts and precautions according to the Centers for Disease Control (CDC)
<http://www.cdc.gov/Features/dsFoodborneEstimates/>

38. List 5 of the leading bacterial causes of food borne illness.
39. Which microorganism causes the most cases of food borne illness annually?
40. What is the recommended temperature for food storage in refrigerators?
41. What is the recommended temperature for food storage in freezers?
42. Which food presents the greatest risk for food borne illness?
43. The CDC recommends three ways to safely thaw poultry; in the refrigerator, in cold water, or _____.
44. What is the most common food borne illness associated with eggs and poultry?
45. What does the CDC recommend as the maximum amount of time food should be left on the table/kitchen counter after a meal before refrigerating?
46. What is the temperature “danger zone” for food which facilitates the growth of bacteria?
47. Generally, what is the maximum amount of time you can keep leftovers stored in the refrigerator after a meal?
48. When reheating leftovers, what temperature should the food reach to kill any bacteria that it may have been contaminated with?
49. List four of the most prevalent causes of food borne illness.
50. According to the CDC, explain the five ways you can reduce the risk of food borne illness.

Team Name/Number: _____

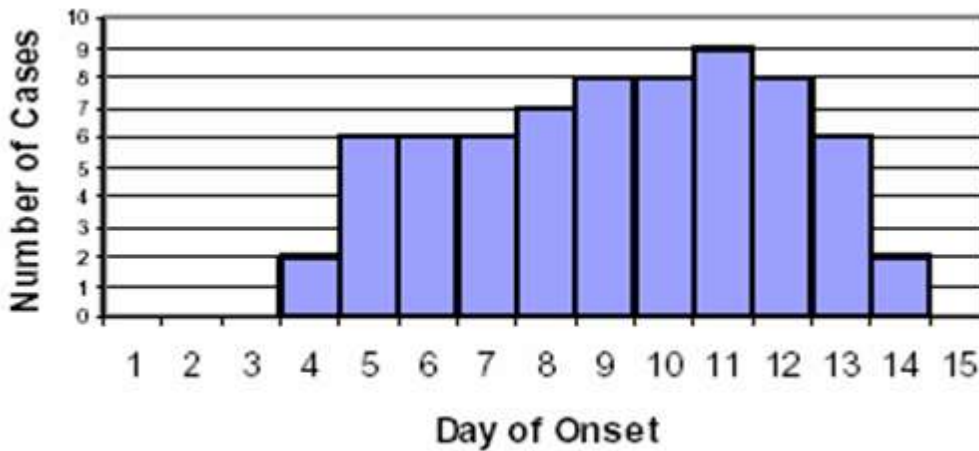
Names of Team Members: _____

Section 4 – General Knowledge (Each question is worth 2 points)

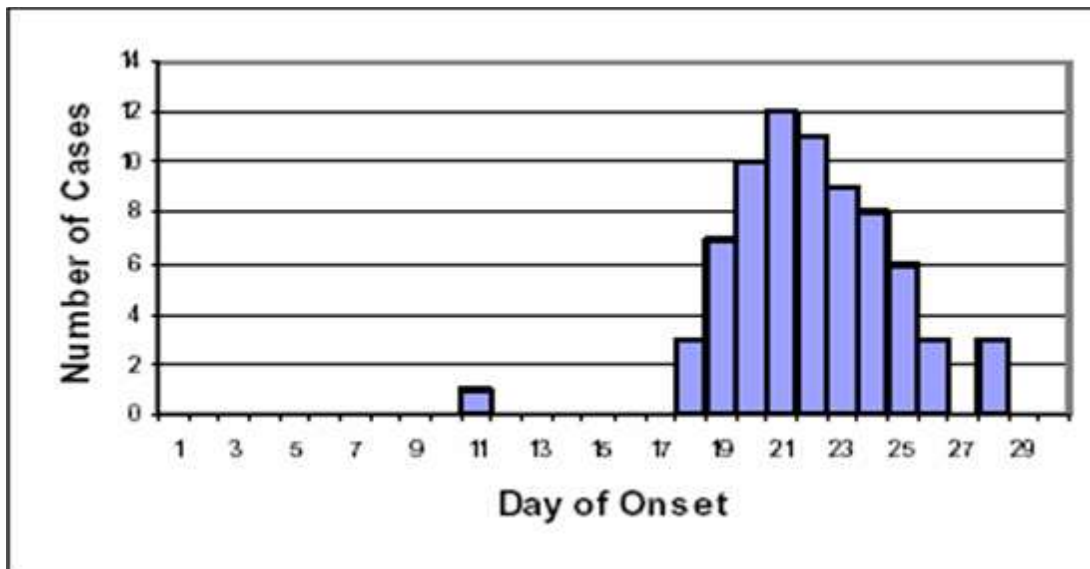
51) Define epidemic curve: _____.

52) An epidemic curve can be useful to evaluate the pattern of spread of a disease. Please list 3 other uses of an epidemic curve. (3 points)

53) Identify and label the type of epidemic curves below. (3 points)



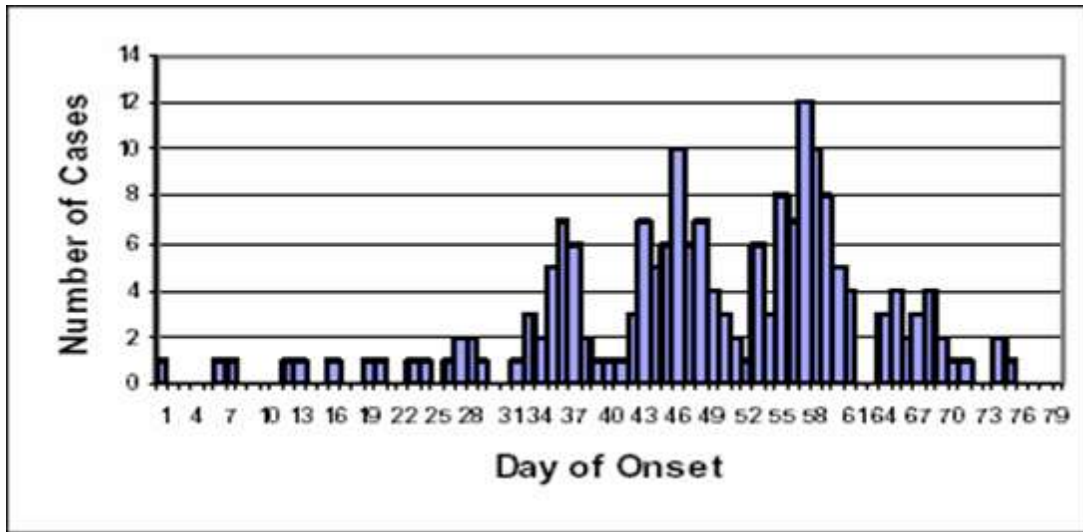
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Team Name/Number: _____

Names of Team Members: _____

Type: _____



Type: _____

54) What do you plot on the y axis of an epi curve? _____

55) What do you plot on the x axis of an epi curve? _____

56) Explain how you show the “baseline” disease level on a epi curve _____

Define the type of study that best matches the description. ()

57) _____ This study is based upon exposure status.

58) _____ This study is used with a small, well-defined population.

59) _____ This study uses the odds ratio to calculate relevant data.

60) _____ This type of study is also known as a survey.

61) _____ This study compares groups of people to determine a cause of a disease.

Team Name/Number: _____

Names of Team Members: _____

Section 5 – Data Analysis (Each question worth 2 points)

Problem 1:

Food Quality and Food Contamination

Multistate Outbreak of Salmonella Infections Associated with Peanut Butter and Peanut

Butter-Containing Products --- United States, 2008–2009

(<http://www.cdc.gov/mmwr>)

On November 25, 2008, an epidemiologic assessment began of a growing cluster of Salmonella serotype Typhimurium isolates that shared the same pulsed-field gel electrophoresis (PFGE) pattern in PulseNet. Salmonellosis is an infection caused by the bacteria *Salmonella*. According to the Centers for Disease Control and Prevention (CDC), salmonellosis causes an estimated 1.4 million cases of foodborne illness and more than 400 deaths annually in the United States. As of January 28, 2009, 529 persons from 43 states and one person from Canada had been reported infected with the outbreak strain. It has been confirmed that reported onset of illness dates have ranged from September 1, 2008, to January 16, 2009. A case was defined as illness by the outbreak strain on or after September 1, 2008. A total of 116 patients were reported hospitalized, and the infection might have contributed to eight deaths. Sequential case-control studies have indicated significant associations between illness and consumption of any peanut butter and specific brands of prepackaged peanut butter crackers but no association with national brand jarred peanut butter sold in grocery stores. Epidemiologic and laboratory findings indicate that peanut butter and peanut paste produced at one plant are the source of the outbreak. These products also are ingredients in many foods produced and distributed by other companies. This outbreak highlights the complexities of "ingredient-driven" outbreaks and the importance of rapid outbreak detection and investigation. Consumers are advised to discard and not eat products that have been recalled.

62) Provide an initial case definition for the Salmonellosis in this outbreak.

63) What type of study was performed to identify peanut butter as the cause of the disease?

64) Identify and calculate the statistic of interest the investigators would have used and explain its importance.

Problem 2:

At least 70 people attending a national conference in a city in Texas became ill with what appeared to be food poisoning. Three hospitals in the area treated and released 48 attendees

Team Name/Number: _____

Names of Team Members: _____

who complained of nausea and vomiting; others with similar symptoms were hospitalized overnight. A health official noted that all of the patients had eaten brunch or lunch at the same hotel. The hotel's lunch menu included roast chicken, roast beef, and a vegetable pasta dish. Because some of the people who became ill were vegetarian, there was particular interest in determining whether the pasta dish might be contaminated. At the time of the report, health officials were still looking for the source of the outbreak. The hotel was cooperating in the investigation and had voluntarily halted food service for the time being.

Questions:

- 65) Explain why you might consider this problem important enough to investigate. Give at least three reasons for investigating.
- 66) Briefly describe the initial steps that you would take in investigating this problem. Indicate the type of data needed to accomplish each step and give examples of sources of such data in a community.
- 67) Describe different approaches available to test potential hypotheses.
- 68) Explain suitable recommendations and interventions for controlling the problem and preventing additional spread of the outbreak.

Tie Breaker Unscramble these common terms:

gmeyedloopi _____

tifmoe _____

rotcev _____

rclsuet _____

lusvrlenicae _____

tcarebai _____

ksir _____

norpi _____

tohs _____

Team Name/Number: _____

Names of Team Members: _____

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