

2020 - SSSS - Disease Detectives

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Part I: Matching

1. b
2. t
3. i
4. s
5. k
6. r
7. c
8. n
9. m
10. a
11. o
12. p
13. h
14. g
15. l
16. f
17. q
18. j
19. e
20. d

Part II: Case Studies

1. Case definition must include:
 - Clinical information: symptoms of vomiting, diarrhea, nausea, and fever
 - Personal characteristics/information: Individuals grades 9-12.
 - Location: A local high school
 - Time period: Between March 21st and March 28th

2.
 - a. Pizza: $5/(5+16) = 5/21 = 0.238$
 - b. Bagels: $9/(9+33) = 9/42 = 0.214$
 - c. Turkey wraps: $26/(26+40) = 26/66 = 0.394$
 - d. Jello: $13/(13+28) = 13/41 = 0.317$

3. - Passive surveillance.

4. - Point source outbreak

5. - No, this should not be correct because the Jello does not have the highest attack rate.

6. - The Turkey wraps most likely caused the disease since they have the highest attack rate of 0.394.
7. - Accepted answers include: The turkey in the wrap was undercooked, the chef did not practice proper hygiene such as washing their hands, The kitchen was unsanitary, etc.
8. - You should use antibiotics.
9. - Salmonella is a bacterial infection, and antibiotics are used to treat bacterial infections.
10. - Accepted answers include: Make sure all chefs wash their hands, Cook the meat thoroughly, Make sure to disinfect the area, make sure the students practice proper hygiene, etc.
11. - Accepted answers: Same personal characteristics, location, and time period, but clinical information should include salmonella bacteria as the cause.
Example:
 - Clinical information: symptoms of vomiting, diarrhea, nausea, and fever, caused by salmonella bacteria.
 - Personal characteristics/information: Individuals grades 9-12.
 - Location: A local high school
 - Time period: Between March 21st and March 28th

Part III: Multiple choice/short response

1. b.
2. c.
3. b.
4. c.
5. d.
6. d.
7. a.
8. d.
9. a.
10. a.
11. b.

- 12.
- This outbreak is a continuous common source outbreak.
 - Accepted answers to why include: The outbreak lasts longer than one incubation period, The cases became less after the handle/source was removed, any appropriate indication of the shape of the epicurve, etc.
13. YLL: Years of Life Lost
- 14.
- a. Strength of Association(Strength): Accepted responses include: any answer where the stronger the association is, the more likely the relationship would be causal.
 - b. Consistency: Accepted responses include any scenario where: making sure the same findings are observed among different populations, same findings are observed in different times, etc.(answer must include similar findings and different conditions)
 - c. Specificity: Accepted responses include any scenario where: One cause will produce one effect
 - d. Temporality: Accepted responses include any scenario where: The exposure to the disease precedes(comes before) the outcome
 - e. Biological Gradient(or Dose response relationship): Accepted responses include any scenario where: increasing the exposure should increase the disease rate(or vice versa)
 - f. Biological Plausibility: Accepted responses include any scenario where: The association should agree with accepted and current biological concepts
 - g. Coherence: Accepted responses include any scenario where: The relationship agrees with existing knowledge(including knowledge of past cases and studies)
 - h. Experimental evidence(or experiment): Accepted responses include: any scenario where: a experimental process can alter a condition.
- *Note another one of Hill's criteria is analogy/alternative explanations but you do not need to write this one*

15.

- Infectious agent: Common cold/Rhinovirus
- Reservoir: Respiratory tract
- Portal of exit: saliva, mucus, etc.
- Mode of transmission: direct(from touching) or indirect droplet transmission
- Portal of entry: Upper respiratory tract
- Susceptible host: uninfected person

16. Incidence = $50,000/5,000,000 \times 1000 = 1/100 \times 1,000 = 10$ people per 1000.

17.

- Accepted answers include: Any scenario where all infected people were infected at one source at around the same time: All cases should occur within one incubation period.
- Accepted answers include: Any scenario where disease spreads from person to person.

18. This outbreak is propagated.

19. d. Waterborne transmission

20. The outbreak is propagated, the outbreak spreads from person to person, propagated outbreaks usually do not spread by water, etc.