

Disease Detectives B - DISEASE DETECTIVES B - December 19 SO Practice - 12-19-2020

**Instructions** (shown before students start the test)

WELCOME DISEASE DETECTIVES! I hope you enjoy this test. Please select the ONE answer to each question that is THE BEST ANSWER for each question and mark it on the scan sheet. Have fun and good luck!

**Introduction** (shown after students start the test)

WELCOME DISEASE DETECTIVES! I hope you enjoy this test. Please select the ONE answer to each question that is THE BEST ANSWER for each question and mark it on the scan sheet. Have fun and good luck!

**1. (1.00 pts)** The study of the distribution and determinants of disease or other health outcomes in populations is known as

- A) Public Health
- B) Medicine
- C) Biostatistics
- D) Epidemiology
- E) All the above

**2. (1.00 pts)** The frequency of occurrences of disease or other health outcomes, as well as a definition of which persons are experiencing the disease is known as

- A) Distribution
- B) Determinants
- C) Public health
- D) Natural history
- E) Case definition

**3. (1.00 pts)** Factors that influence the occurrence of disease or other health comes used to explore the "why" and "how" of disease occurrence are called

- A) Distributions
- B) Determinants
- C) Biostatistics
- D) Virulence
- E) Associations

**4. (1.00 pts)** Which of the following is NOT included in "determinants" from the definition in Question 1?

- A) Causes
- B) Risk Factors
- C) Control Measures
- D) Agents
- E) Sources

**5. (1.00 pts)** The epidemiologic triad of disease causation refers to

- A) Time, person, place
- B) Source, mode of transmission, susceptible host
- C) Case-control study, cohort study, clinical trial
- D) Agent, host, environment
- E) Science, research, disease

6. (1.00 pts) The proportion of infected persons who develop clinical disease is known as

- A) Association
- B) Distribution
- C) Infectivity
- D) Pathogenicity
- E) Virulence

7. (1.00 pts) Indirect transmission of disease/illness could NOT be spread by which of the following?

- A) Cell phones
- B) Video game controllers
- C) Preschool toys
- D) Droplet contact
- E) Scissors

8. (1.00 pts) Which of the following is an example of a zoonotic disease?

- A) HIV/AIDS
- B) Hepatitis B
- C) Rabies
- D) Cholera
- E) Norovirus

9. (1.00 pts) Which of the following is an example of a vehicle for disease transmission?

- A) Mosquitoes
- B) Helminths
- C) Flies
- D) Fomites
- E) Teslas

10. (1.00 pts) Which of the following can act as disease reservoirs?

- A) Animals
- B) Carriers
- C) Cases
- D) Water
- E) All of the above

11. (1.00 pts) The spectrum of disease process without intervention is known as

- A) Validity
- B) Generalizability
- C) Case definition
- D) Causality
- E) Natural history of disease

12. (1.00 pts)

For hypothetical disease morbum malum, there are typically 500-600 cases reported each year in fictional city civitatem poetica. Last year, there were 590 cases of this disease reported. What term best describes this pattern of occurrence?

- A) Sporadic
- B) Outbreak

- C) Endemic
- D) Normal
- E) Cluster

**13. (1.00 pts)**

In 1918, influenza caused by an H1N1 virus infected 500 million people, about one-third of the world's population. What term best describes this pattern of occurrence?

- A) Sporadic
- B) Outbreak
- C) Endemic
- D) Pandemic
- E) Cluster

**14. (1.00 pts)** Select the most appropriate or "best choice" study design with the following description: [nl] Examines disease/determinant relationship at the aggregate level

- A) Case-control
- B) Cross-sectional
- C) Clinical trial
- D) Prospective cohort
- E) Ecological/correlational

**15. (1.00 pts)** Select the most appropriate or "best choice" study design with the following description: [nl] Determines level of disease and/or risk in individuals at a point in time

- A) Case-control
- B) Cross-sectional
- C) Clinical trial
- D) Prospective cohort
- E) Ecological/correlational

**16. (1.00 pts)** Select the most appropriate or "best choice" study design with the following description: [nl] Follows study subjects through time to assess effectiveness of treatment

- A) Case-control
- B) Cross-sectional
- C) Clinical trial
- D) Prospective cohort
- E) Ecological/correlational

**17. (1.00 pts)** Select the most appropriate or "best choice" study design with the following description: [nl] Allows for the investigation of rare diseases or conditions

- A) Case-control
- B) Cross-sectional
- C) Clinical trial
- D) Prospective cohort
- E) Retrospective cohort

**18. (1.00 pts)** Select the most appropriate or "best choice" study design with the following description: [nl] Allows for the investigation of a wide array of risk factors

- A) Case-control
- B) Cross-sectional
- C) Clinical trial
- D) Prospective cohort
- E) Retrospective cohort

**19. (1.00 pts)**

Select the most appropriate or "best choice" study design with the following description: [n] Allows for the disease research to control the exposure experience of subjects

- A) Case-control
- B) Cross-sectional
- C) Clinical trial
- D) Prospective cohort
- E) Retrospective cohort

**20. (1.00 pts)** Select the most appropriate or "best choice" study design with the following description: [n] Allows for a fairly rapid and low-cost investigation of a specific question

- A) Case-control
- B) Cross-sectional
- C) Clinical trial
- D) Prospective cohort
- E) Retrospective cohort

**21. (1.00 pts)** Which of the following is NOT an objective of public health surveillance?

- A) Provide information about new and changing trends in health status of a population
- B) Provide feedback to monitor system of collecting health-related information
- C) Provide timely warning of public health diseases in order to mobilize interventions
- D) Provide a means of preventing and controlling disease
- E) All of the above

**22. (1.00 pts)** Data collected through which of the following methods is commonly used for public health surveillance?

- A) Vital registration
- B) Randomized clinical trials
- C) Disease notifications
- D) Phone surveys
- E) All of the above

**23. (1.00 pts)**

Vital statistics provide an archive of certain health data. These do not become surveillance data until they are analyzed, interpreted, and disseminated with the intent of influencing public health decision-making or action.

- A) True
- B) False
- C) Not enough information to determine
- D) I have no idea
- E) All the above

**24. (1.00 pts)** Notifiable disease surveillance usually focuses on morbidity from the diseases on the list and does not cover mortality from those diseases.

- A) True
- B) False
- C) Not enough information to determine
- D) I have no idea
- E) None of the above

**25. (1.00 pts)** The list of diseases that a doctor must report to the local health department is typically compiled by the:

- A) Local health department

- B) State health department
- C) Centers for Disease Control and Prevention (CDC)
- D) The World Health Organization (WHO)
- E) Medical licencing board

**26. (1.00 pts)** Which of the following is something that should NOT be addressed for evaluating and improving public health surveillance?

- A) The purpose and objectives of surveillance
- B) Resources needed to conduct surveillance
- C) The presence of characteristics of well-conducted surveillance
- D) The effectiveness of measures for controlling the disease under surveillance
- E) All the above should be addressed

**27. (1.00 pts)** The primary reason for preparing and distributing periodic surveillance summaries is which of the following?

- A) To document recent epidemiologic investigations
- B) To provide reprints of MMWR articles, reports, and recommendations
- C) To acknowledge the contributions of those who submitted case reports
- D) To provide timely information on disease patterns and trends to those who need to know it
- E) None of the above

**28. (1.00 pts)** The case-definition used for surveillance of a health problem should be the same as the case definition used for clinical (treatment) purposes.

- A) True
- B) False
- C) Not enough information to determine
- D) I have no idea
- E) Maybe

**29. (1.00 pts)** A state health department decides to strengthen its notifiable disease reporting. The one best action to take is to:

- A) Allow reporting through a website on the internet
- B) Require more disease-specific forms from local health departments
- C) Ensure that all persons with the responsibility to report understand the requirements and reasons for reporting and how the reports will be used
- D) Reduce the number of diseases on the list
- E) None of the above

**30. (1.00 pts)** Health agencies contact health providers seeking reports as searching for other cases of measles to identify potential outbreaks is what type of surveillance?

- A) Passive
- B) Active
- C) Sentinel
- D) Syndromic
- E) Epidemiologic

**31. (1.00 pts)**

The type of surveillance that focuses on one or more symptoms to detect or anticipate outbreaks as influenza causing symptoms and absentee increases is known as what type of surveillance?

- A) Passive
- B) Active
- C) Sentinel
- D) Syndromic
- E) Epidemiologic

**32. (1.00 pts)**

The San Diego Office of Public Health wants to determine if pasteurizing oysters decreases the likelihood of gastrointestinal illness. They recruited a total of 100 UCSD students. Fifty students are given pasteurized oysters, and 50 students were given non-pasteurized, but state-certified oysters. All students were followed for 2 days. It is observed that 2 of the students who ate pasteurized oysters got sick, and 5 of those who ate non-pasteurized oysters got sick. [nl] Calculate the appropriate measure of association.

- A) 0.4
- B) 1.1
- C) 2.5
- D) 2.67
- E) What's a measure of association?

**33. (1.00 pts)**

A case-control study was conducted in Whooville to determine the association between smoking and coronary heart disease. There were 200 cases and 400 controls selected for the study. 56% of the cases smoked, whereas only 44% of the controls smoked. [nl] Calculate the appropriate measure of association.

- A) 0.62
- B) 1.1
- C) 1.38
- D) 1.62
- E) I still don't know what a measure of association is

**34. (1.00 pts)** The period between exposure and first symptoms is known as the:

- A) Stage of susceptibility
- B) Stage of clinical disease
- C) Stage of disability
- D) Subclinical stage of disease
- E) Dormant stage

**35. (1.00 pts)** Increases in the ability of a biologic agent to enter a host is called:

- A) Pathogenicity
- B) Virulence
- C) Toxicity
- D) Infectivity
- E) Prevalence

**36. (1.00 pts)** Diseases with animal reservoirs are:

- A) Outbreaks
- B) Portals
- C) Nosocomial infections
- D) Zoonosis
- E) Dangerous

**37. (1.00 pts)** The water borne transmission of cholera via the Broad Street pump in John Snow's famous study is an example of

- A) Common vehicle spread
- B) Serial transfer
- C) Droplet transmission
- D) Nosocomial infection
- E) Animal carrier

**38. (1.00 pts)** Infectious disease outbreak investigations include both an epidemiologic and laboratory component.

- A) True
- B) False
- C) Not enough information to determine
- D) I have no idea
- E) 42

**39. (1.00 pts)**

Data from a hypothetical foodborne outbreak is shown in Table A. Use the data to interpret the following questions. [nl] What percentage of cases experienced diarrhea?

- A) 5%
- B) 50%
- C) 100%
- D) Not enough information to determine

**40. (1.00 pts)** What is the median incubation period for this illness?

- A) 1 hour
- B) 2 hours
- C) 2.7 hours
- D) 4 hours
- E) Not enough information to determine

**41. (1.00 pts)** Calculate the attack rate in those who ate salmon sushi.

- A) 40%
- B) 50%
- C) 60%
- D) Not enough information to determine

**42. (1.00 pts)** Calculate the attack rate for those who did not eat salmon sushi.

- A) 40%
- B) 50%
- C) 60%
- D) Not enough information to determine

**43. (1.00 pts)** Calculate the attack rate in those who ate the ice cream.

- A) 40%
- B) 60%
- C) 67%
- D) Not enough information to determine

**44. (1.00 pts)** Calculate the attack rate of those who did not eat the ice cream

- A) 20%
- B) 25%
- C) 60%
- D) 67%

**45. (1.00 pts)** Calculate the appropriate measure of association for eating ice cream.

- A) 67%
- B) 1.0
- C) 2.67
- D) I still don't know what a measure of association is

**46. (1.00 pts)**

While there is a lot of attention in the media with concerns of COVID-19, illness caused by the new coronavirus, a total of 18,696 total cases of influenza have been confirmed in San Diego alone (4March2020 report, data ending 29Feb2020). The following questions require you to look at and several graphics asking about influenza cases in San Diego. [Actual data taken from the Epidemiology and Immunization Services Branch of the County of San Diego Health and Human Services Agency] [nl] [nl] Look at Table 1 and interpret the following statement. [nl] The number of reported cases of influenza during this flu season (2019-2020) is 3 times more than it was at this point last flu season (2018-2019)

**Table 1. Influenza Surveillance Indicators.**

Indicator	2019-20 Season			2018-19 Season			Prior 3-Year Average**		
	Week 9	Week 8	Total to Date	Week 9	Total To Date	Season Total	Week 9	Total To Date	Season Total
All influenza detections reported (rapid or PCR)	784	1,215	18,696	617	6,103	9,655	572	9,586	12,110
Percent of emergency department visits for ILI	6%	7%		6%			5%		
Percent of deaths registered with pneumonia and/or influenza	7%	9%		6%			8%		
Number of influenza-related outbreaks**	1	5	56	3	15	25	3	54	59
Number of influenza-related deaths reported <sup>a</sup>	6	11	80	3	44	77	5	131	169

Influenza season is July 1 – June 30, Weeks 27-26. Previous weeks case counts or percentages may change due to delayed processing or reporting.  
 \*\*Includes FYs 2016-17, 2017-18, and 2018-19.  
 \*\*At least one case of laboratory-confirmed influenza in a setting experiencing two or more cases of influenza like illness (ILI) within a 72-hour period.  
 Total confirmed influenza outbreaks in prior seasons: 25 in 2018-19, 119 in 2017-18, and 34 in 2016-17.  
<sup>a</sup>Current FY deaths are shown by week of report; by week of death for prior FYs. Total deaths reported in prior seasons: 77 in 2018-19, 343 in 2017-18, and 87 in 2016-17.

- A) True
- B) False
- C) Not enough information to determine
- D) I have no idea
- E) Possibly

**47. (1.00 pts)** [nl] Look at Table 1 above and interpret the following statement. [nl] There are more deaths related to influenza this flu season than last season.

- A) True
- B) False
- C) Can't determine, because the current flu season this year is not yet over
- D) I have no idea
- E) Maybe, but I am not sure how to figure out the data

**48. (1.00 pts)** What is the second most common type of influenza this season, as indicated in Table 2?

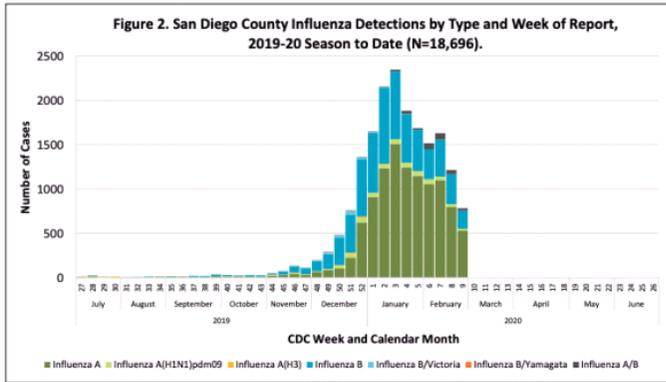
**Table 2. Influenza Cases Reported, 2019-2020 Season\***

Positive Test Type/Subtype	Week 9	Week 8	Total to Date	Percent to Date
Influenza A, subtype unknown	530	800	10,968	58.7%
Influenza A (H1N1)pdm09	22	30	558	3.0%
Influenza A (H3)	1	0	107	0.6%
Influenza B, subtype unknown	204	336	6,563	35.1%
Influenza B/Victoria	0	0	169	0.9%
Influenza B/Yamagata	0	0	5	0.03%
Influenza, type unknown	27	49	326	1.7%
<b>Total</b>	<b>784</b>	<b>1,215</b>	<b>18,696</b>	<b>100.0%</b>

\*Season is July 1- June 30, Weeks 27-26.

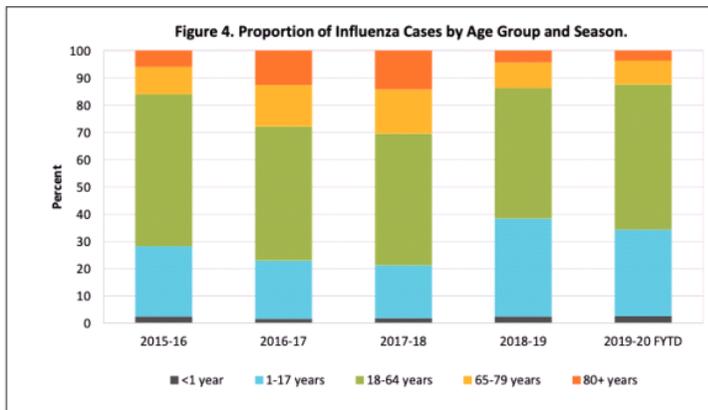
- A) Influenza A, subtype unknown
- B) Influenza A (H1N1)pdm09
- C) Influenza B, subtype unknown
- D) Unknown subtype

**49. (1.00 pts)** Based on the data from Figure 2, what can you conclude?



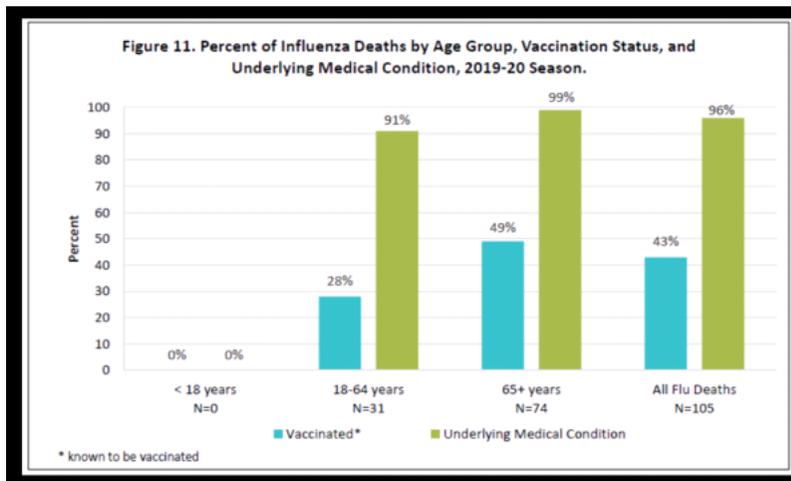
- A) More people are visiting the emergency room for other illnesses
- B) If you didn't get a flu vaccine this year, you don't need to get it now
- C) Washing your hands with soap and water is the best way not to get sick
- D) The number of influenza cases is starting to decline in San Diego
- E) I don't know, I'm panicking about COVID-19

50. (1.00 pts) According to Figure 4, the majority of reported influenza cases are in what age group?



- A) <1 year
- B) 1-17 years
- C) 18-64 years
- D) 65-79 years
- E) 80+ years

51. (1.00 pts) To date, there have been 80 reported deaths related to influenza reported in San Diego County. What can you conclude from the data shown in Table 11?



- A) It is possible to still get the flu even if you have been vaccinated
- B) There have been no deaths in children (<18 years old)
- C) The majority of deaths occurred in people age 65 and up
- D) The majority of deaths occurred in people with underlying medical conditions
- E) All the above

**52. (1.00 pts)** Which of the following is the best way to prevent getting sick from the flu?

- A) Don't go anywhere
- B) Take lots of vitamins
- C) Take Tamiflu
- D) Get vaccinated each year
- E) Don't touch anything

**53. (1.00 pts)** You can spread the flu to others before you develop symptoms.

- A) True
- B) False
- C) Not enough information to determine
- D) I have no idea
- E) Wash your hands

**54. (1.00 pts)** You can have the flu and have no symptoms.

- A) True
- B) False
- C) Not enough information to determine
- D) I have no idea
- E) Wash your hands

**55. (1.00 pts)** You can get the flu from the flu vaccine.

- A) True
- B) False
- C) Not enough information to determine
- D) I have no idea
- E) Wash your hands

56. (1.00 pts) You can treat the flu with antibiotics.

- A) True
- B) False
- C) Not enough information to determine
- D) I have no idea
- E) Wash your hands

57. (1.00 pts)

The following hypothetical data on an outbreak of influenza was collected over a period of 6 months in Olympia, Sciland. The population of this awesome town as of November 1 is 250,000. Assume the duration of influenza is 2 weeks, and cases and deaths in each months were distributed evenly across the month. Also assume that once you have recovered from influenza you are immune to future re-infection that season, and that no one was immunized prior to the outbreak. Using the data from the table, calculate the following question 57 to 61.

What is the crude mortality for Olympia, Sciland in this period?

	Nov	Dec	Jan	Feb	Mar	Apr
Cases	5	40	120	80	20	5
Flu-related deaths*	0	4	12	6	2	0
All other deaths	100	100	100	100	100	100

\*Deaths due to influenza in incident cases, occurring within 1 week of onset

- A) 108 / 100,000 / 6 months
- B) 270 / 250,000 / year
- C) 249.6 / 100,000 / 6 months
- D) 624 / 250,000 / year
- E) Not enough information to determine

58. (1.00 pts) What is the prevalence of influenza in Olympiad, Sciland on January 16? [n]/[n]

- A) 0.024%
- B) 2.2%
- C) 0.022%
- D) 2.4%
- E) Not enough information to determine

59. (1.00 pts) What is the cumulative incidence rate for influenza in Olympia, Sciland for this period?

- A) 270 / 100,000 / year
- B) 0.108%
- C) 108 / 100,000 / 6 months
- D) 270 / 250,000 / year
- E) I forgot my calculator

60. (1.00 pts) What is the case-fatality rate for influenza for this period?

- A) 8.9% / year
- B) 17.8% / 6 months
- C) 0.4% / 6 months
- D) 8.9% / 6 months
- E) Not enough information to determine

61. (1.00 pts) What was the incidence density (ID) for November through January in this outbreak?

- A) 2.2%
- B) 2.2 / 10,000 person-months
- C) 165 / 314 person-weeks
- D) 2.2 / 100,000 person-months
- E) What's incidence density?

62. (1.00 pts)

COVID-19 [nl] [nl] The following is the current definition for a suspected case of COVID-19:[nl] [nl] (A) A patient with acute respiratory illness (fever and at least one sign/symptom of respiratory disease (e.g., cough, shortness of breath), AND with no other etiology that fully explains the clinical presentation AND a history of travel to or residence in a country/area or territory reporting local transmission of COVID-19 disease during the 14 days prior to symptom onset. [nl][nl] OR (B) A patient with any acute respiratory illness AND having been in contact with a confirmed or probable COVID-19 case in the last 14 days prior to onset of symptoms; [nl][nl] OR (C) A patient with severe acute respiratory infection (fever and at least one sign/symptom of respiratory disease (e.g., cough, shortness of breath) AND requiring hospitalization AND with no other etiology that fully explains the clinical presentation. [nl][nl] How will a person with a suspected case of COVID-19 differ from someone with a confirmed case?

- A) A confirmed case will have visited the emergency room for treatment
- B) A confirmed case will have a much more serious illness
- C) A confirmed case will have had the illness for a longer period of time
- D) A confirmed case will have a laboratory confirmation of infection, irrespective of clinical signs and symptoms
- E) A confirmed case will have a laboratory confirmation of infection, but have all the clinical signs and symptoms

63. (1.00 pts)

To date, those confirmed with COVID-19 infection is low in the United States. As of 05March2020, a total of 99 cases and 10 deaths have been reported across 13 states. The 99 cases reported include both confirmed and presumptive cases. Public health officials have indicated that the spread of COVID-19 is likely to increase. What should you do in order to prepare?

- A) Panic
- B) Stock up on months of toilet paper and water from Costco
- C) Stay at home and don't go anywhere
- D) Wash your hands often, avoid touching your face
- E) Where face masks everywhere

64. (1.00 pts) Why is the current coronavirus called COVID-19?

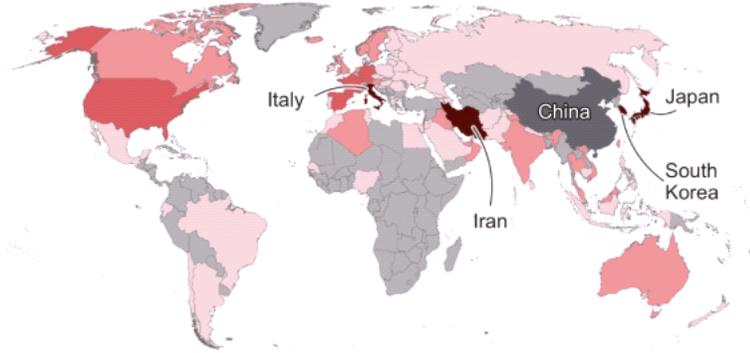
- A) COV = coronavirus, ID-19 = identified in 2019
- B) COV = coronavirus, ID = immunodeficiency, 19 = first identified in 2019
- C) COV = coronavirus, ID = immunodeficiency, 19 = gene marker 2019
- D) CO = corona, VI = virus, D = disease, 19 = first identified in 2019
- E) What's COVID-19?

65. (1.00 pts) What is the difference between a spot map and an area map?

- A) Nothing, they are the same
- B) An area map can tell you how deadly the illness is
- C) An area map takes differences in population size into consideration by employing rates rather than absolute numbers
- D) An area map uses different colors that have the same intensity
- E) None of the above

66. (1.00 pts) The following map is a map of the current COVID-19 situation worldwide. What kind of map is it?

## Cases of coronavirus outside China



Source: WHO, health ministries. Updated: 5 Mar 06:00 GMT

BBC

- A) Spot map
- B) Area map
- C) Both a spot and an area map
- D) Neither spot nor area map
- E) I should have studied more

### 67. (1.00 pts)

In the current COVID-19 outbreak, what is a major concern for those residing in the United States? [n] [n] (I) Bringing the disease into the U.S. via travel (air, land, or sea) [n] (II) Controlling the spread of the virus in healthcare settings [n] (III) The highly contagious nature and fatality rate of the virus [n] (IV) Contaminating food and water supplies with the virus [n]

- A) I + II only
- B) III + IV only
- C) I + II + III only
- D) II + III only
- E) All the above (I + II + III + IV)

### 68. (1.00 pts)

During the mid 19th century, cholera was a major problem in England. At that time, there was disagreement on what was the cause of cholera. In 1854, Dr. John Snow demonstrated that cases of cholera that broke out in a district of central London could be traced to a single point source. At that time, people got their water by signing up with one of the water supply companies. Snow collected information by going from house to house, counting all deaths from cholera in each house, and determine which company supplied water to each house. [n] [n] Examine the findings of John Snow in the table below, and then answer the following questions. [n] [n] What is the death rate per 10,000 houses for those who had water supplied from the Southwark and Vauxhall Company?

Water Supply Company	Number of Houses	Cholera Deaths
Southwark and Vauxhall Company	40,046	1,263
Lambeth Company	26,107	98
Other London districts	256,423	1,422

- A) 0.032 per 10,000 houses
- B) 315 per 10,000 houses
- C) 39 per 10,000 houses
- D) 56 per 10,000 houses
- E) A lot

69. (1.00 pts) Using the table in question 68, What is the death rate per 10,000 houses for those who had water supplied from the Lambeth Company?

- A) 0.0038 per 10,000 houses
- B) 38 per 10,000 houses
- C) 39 per 10,000 houses
- D) 56 per 10,000 houses
- E) Too many

**70. (1.00 pts)** Using the table in question 68, What is the death rate per 10,000 houses for those who had water supplied from the other districts in London?

- A) 0.0038 per 10,000 houses
- B) 38 per 10,000 houses
- C) 39 per 10,000 houses
- D) 56 per 10,000 houses
- E) Not enough information to determine

**71. (1.00 pts)**

The image below shows the distribution of cholera cases in the Golden Square Area of London from August-September in 1948. Which well/pump site would you pick as the most likely source of contaminated water?



- A) Pump A
- B) Pump B
- C) Pump C
- D) All the pumps
- E) Not enough information to determine

**72. (1.00 pts)** What other factors could cause the difference in cholera rates in different parts of London?

- A) Spread by food or animals
- B) People working or visiting different parts of town
- C) Different vaccination rates
- D) Both choice A and B
- E) None of the above

**73. (1.00 pts)**

Examine the data collected from the Office of the Registrar General of England and Wales and the number of cholera deaths in 1853-1854 according to the two water companies supplying the various subdistricts. Does the data in the table support John Snow's hypothesis that polluted water causes cholera?

Water Supply Company	Population in 1851	Cholera Deaths 1853-1854	Deaths per 100,000 Living
Southwark and Vauxhall Company	167,654	192	114
Lambeth Company	14,632	0	0
Other London districts	301,149	182	60

- A) Yes
- B) No
- C) Not enough information to determine
- D) I have no idea
- E) Wash your hands

74. (1.00 pts) Why is the mortality rate presented as "deaths per 100,000"?

- A) It is easier to understand
- B) You do not have to deal with fractional deaths
- C) You are using a standard of comparison for other sample populations
- D) All of the above
- E) None of the above

75. (1.00 pts)

Unfortunately, John Snow died in 1858 not knowing what caused cholera. It wasn't until 1876 that a German doctor, Robert Koch, discovered that *Vibrio cholera* was the cause of illness. What type of infectious agent is this?

- A) Virus
- B) Bacteria
- C) Protozoa
- D) Fungi
- E) None of the above

76. (1.00 pts) In the scenario, water served as what type of transmission?

- A) Fomite
- B) Vector
- C) Vehicle
- D) Zoonotic
- E) Air-borne

77. (1.00 pts)

Match the definition to one of Hill's criteria for causality. [nl][nl] The same findings are observed among different populations, in different study designs and different times.

- A) Strength of the association
- B) Consistency
- C) Specificity
- D) Temporal sequence
- E) Biological gradient

78. (1.00 pts) Match the definition to one of Hill's criteria for causality. [nl][nl] Change in disease rates should follow corresponding changes in exposure.

- A) Strength of the association
- B) Consistency

- C) Biological gradient
- D) Biological plausibility
- E) Coherence

**79. (1.00 pts)** Match the definition to one of Hill's criteria for causality. [nl][nl] Does the relationship agree with current knowledge of the natural history/biology of disease?

- A) Strength of the association
- B) Consistency
- C) Biological gradient
- D) Biological plausibility
- E) Coherence

**80. (1.00 pts)** What kind of graph should you use for categorical variables on the x-axis?

- A) Histogram
- B) Bar chart
- C) Pie chart
- D) Line graph
- E) Any of the above

**81. (1.00 pts)** What kind of graph should you use for continuous data?

- A) Histogram
- B) Bar chart
- C) Pie chart
- D) Spot map
- E) None of the above

**82. (1.00 pts)** What kind of graph should you use to display an epidemic curve?

- A) Histogram
- B) Bar chart
- C) Pie chart
- D) Line graph
- E) Area map

**83. (1.00 pts)**

A table in a report or manuscript should include:[nl] (I) Title [nl] (II) Row and column labels [nl] (III) Footnotes that explain abbreviations, symbols, exclusions [nl] (IV) Source of the data [nl] (V) Explanation of the key findings

- A) I + II only
- B) I + II only
- C) I + II + III only
- D) I + II + III + IV only
- E) All the above (I + II + III + IV + V)

**84. (1.00 pts)**

Which of the following problems could increase the risk of spreading an infectious disease such as tuberculosis?[nl][nl] (I) Overcrowding prisons[nl] (II) Increasing homeless population[nl] (III) increasing teenage cigarette smoking[nl] (IV) Tuberculosis skin test reactions from vaccinations of immigrants[nl]

- A) I + II only
- B) III + IV only
- C) I + II + III only
- D) I + II + IV only

- E) All the above (I + II + III + IV)

**85. (1.00 pts)** What is the best graphical way to display a timing of an outbreak?

- A) Endemic curve  
 B) Pandemic curve  
 C) Epidemic curve  
 D) Epidemiologic curve  
 E) Bell curve

**86. (1.00 pts)** What would be in the numerator when calculating the annual incidence of measles in San Diego last year?

- A) The number of those who died from measles in 2019  
 B) The number with confirmed diagnoses in 2019  
 C) The number of all suspected and confirmed diagnoses of measles in 2019  
 D) The total number of those who have ever been infected with the measles and still living  
 E) The number of those who have confirmed diagnoses and not been vaccinated

**87. (1.00 pts)** What would be in the denominator when calculating the incidence of measles in San Diego in 2019?

- A) The number of students attending school from Jan 1 - Dec 31, 2019  
 B) The total population of San Diego in 2019  
 C) The total population of children under 18 years old in 2019  
 D) The total population of those who were unvaccinated by 2019  
 E) The total population of those who were vaccinated by 2019

**88. (1.00 pts)** Measles are a preventable illness.

- A) True  
 B) False  
 C) Not enough information to determine  
 D) I have no idea  
 E) Are we almost done yet?

**89. (1.00 pts)**

Let's say there was a new outbreak at your local Chipotle. When characterizing an outbreak by person, which of the following variables would you include? [nl][nl] (I) Age [nl] (II) Gender [nl] (III) Whether infected person is an employee or not [nl] (IV) Clinical symptoms presented[nl]

- A) I + II only  
 B) I + II + III only  
 C) I + III only  
 D) I + II + IV only  
 E) All the above (I + II + III + IV + V)

**90. (1.00 pts)** Which of the following are viruses? [nl][nl] (I) Norovirus[nl] (II) Salmonella[nl] (III) Escherichia coli[nl] (IV) Hepatitis A[nl] (V) Coronavirus[nl]

- A) I + V only  
 B) I + III only  
 C) I + IV only  
 D) I + IV + V only  
 E) All of the above (I + II + III + IV + V)

**91. (1.00 pts)** The common cold is caused by a type of coronavirus.

- A) True
- B) False
- C) Not enough information to determine
- D) I have no idea
- E) Ah-choo!

**92. (1.00 pts)** You can use influenza vaccine to prevent COVID-19.

- A) True
- B) False
- C) Not enough information to determine
- D) I have no idea
- E) Seriously?

**93. (1.00 pts)** Pregnant women are often advised to avoid eating unpasteurized soft cheese and deli meats to prevent themselves from possible illness due to what organism?

- A) Escherichia coli
- B) Salmonella
- C) Clostridium botulinum
- D) Listeria monocytogenes
- E) Hepatitis A

**94. (1.00 pts)** You should avoid eating foods that come from cans that are severely dented to avoid possible illness from what organism?

- A) Escherichia coli
- B) Salmonella
- C) Clostridium botulinum
- D) Listeria monocytogenes
- E) Hepatitis A

**95. (1.00 pts)** Food-borne illness caused by eating undercooked hamburger is most likely caused by

- A) Escherichia coli
- B) Salmonella
- C) Clostridium botulinum
- D) Listeria monocytogenes
- E) Hepatitis A

**96. (1.00 pts)** Food-borne illness caused by eating raw oysters is most likely caused by what organism?

- A) Escherichia coli
- B) Salmonella
- C) Norovirus
- D) Listeria monocytogenes
- E) Hepatitis A

**97. (1.00 pts)** The pathogen responsible for causing the most reported cases of food-borne illness each year in the United States is

- A) Norovirus
- B) Salmonella
- C) Escherichia coli
- D) Listeria monocytogenes
- E) Hepatitis A

98. (1.00 pts) Which of the following may be found in raw produce?

- A) Norovirus
- B) Salmonella
- C) Escherichia coli
- D) Listeria monocytogenes
- E) All the above

99. (1.00 pts) Which of the following is currently considered an endemic illness in the United States?

- A) Malaria
- B) Zika virus illness
- C) Polio
- D) Rubella
- E) Varicella (Chickenpox)

100. (1.00 pts) Throughout the day at the Science Olympiad Regional Event, I am going to remember to frequently

- A) Cram more science facts
- B) Eat lots of pizza
- C) Run laps
- D) Keep track of my pencils
- E) Wash my hands

101. (1.00 pts) List the four criteria established by Koch to identify the causative agent of a particular disease

102. (1.00 pts) Of the 10 most important public health problems and concerns identified by the CDC, write down 3.

103. (1.00 pts) What are the three types of infections from food borne illnesses?

104. (1.00 pts) What is the danger zone for bacteria?

105. (1.00 pts) What are the previous names of HIV (acronyms are fine)?

106. (1.00 pts) Explain the Delaney Clause.

107. (1.00 pts) List four types of error.

108. (1.00 pts)

There is a new virus going around a closed community. Only males are at risk of contracting the disease. The community is made up of 40% female and 60% males. Given there are 406 new cases of this disease, and the population size at the time is 2350 people, what is the rate?

109. (1.00 pts) If there was data that showed the progression of new COVID-19 cases, what type of graph would you use to display that data?

110. (1.00 pts) Explain analytical epidemiology.

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CONGRATULATIONS on completing this exam! Enjoy the rest of your day. If you're happy and you know it, WASH YOUR HANDS. :)

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