MY SO PRACTICE TEST

DIVISION C - HIGH SCHOOL, GRADES 9-12

PRACTICE TEST

Instructions

- You have 50 minutes to complete this test.
- You may write your answers directly in the test.
- You may use any notes or resources you have created or collected.
- You may use a calculator and scratch paper if necessary.
- The scenarios presented here are both hypothetical but based on actual outbreaks and public health problems.
- Good Luck!

Test Questions

1. Which of the below statements about epidemiology are true?
    a. The diagnosis and treatment of illnesses in individual patients is an important part of epidemiology.
    b. Epidemiologic methods are targeted at populations, communities and groups of individuals.
    c. Epidemiologists are primarily concerned with individuals.
    d. A goal of epidemiology is to treat cases of illness found in individuals.

2. In a state that did not require varicella (chickenpox) vaccination, a school experienced a prolonged outbreak of varicella among its students that began in September and continued through December. To calculate the probability or risk of illness among the students, which denominator would you use?
    a. Average number of susceptible students during outbreak
    b. Number of susceptible students at the beginning of the period (i.e., September)
    c. Number of susceptible students at the ending of the period (i.e., June)
    d. Number of susceptible students at the midpoint of the period (late October/early November)

3. Many of the students at the boarding school, including 6 just coming down with varicella, went home during the Thanksgiving break. About 2 weeks later, 4 siblings of these 6 students (out of a total of 10 siblings) developed varicella. The secondary attack rate among siblings was, therefore:
    a. 2/3
    b. 2/5
    c. 2/5
    d. 3/5

Investigators enrolled 100 diabetics without eye disease in a cohort (follow-up) study. The results of the first 3 years were as follows:
Year 1: 0 cases of eye disease detected out of 92; 8 lost to follow-up
Year 2: 2 new cases of eye disease detected out of 80; 2 had died; 10 lost to follow-up
Year 3: 3 new cases of eye disease detected out of 63; 2 more had died; 13 more lost to follow-up

4. The person-time incidence rate is calculated as:
    a. 5/100
    b. 5/63
    c. 5/235
    d. 5/250

5. The units for the quantity you calculated in Question 8 could be expressed as (choose all that apply):
    a. cases per 100 persons
    b. cases per person-year
    c. cases per person per year
    d. percent

Use the following information for Questions 6–10.
Within 10 days after attending a June wedding, an outbreak of cyclosporiasis occurred among attendees. Of the 83 guests and wedding party members, 79 were interviewed; 54 of the 79 met the case definition. The following two-by-two table shows consumption of wedding cake (that had raspberry filling) and illness status.

		Ill	Well	Total
	Total	54	25	79
Ate wedding cake?	**Yes**	50	3	53
	No	4	22	26

Source: Ho AY, Lopez AS, Eberhart MG, et al. Outbreak of cyclosporiasis associated with imported raspberries, Philadelphia, Pennsylvania, 2000. Emerg Infect Dis 2002;l8:783–6.

6. The fraction 54/79 is a/an (Select all that apply):
    a. Attack rate
    b. Food-specific attack rate
    c. Incidence proportion
    d. Proportion

7. The fraction 50/54 is a/an (Select all that apply):
    a. Attack rate
    b. Food-specific attack rate
    c. Incidence proportion
    d. Proportion

8. The fraction 50/53 is a/an (Select all that apply):
    a. Attack rate
    b. Food-specific attack rate
    c. Incidence proportion
    d. Proportion

9. The best measure of association to use for these data is a/an:

    a. Food-specific attack rate
    b. Odds ratio
    c. Rate ratio
    d. Risk ratio

10. The best estimate of the association between wedding cake and illness is:
    a. 6.1
    b. 7.7
    c. 68.4
    d. 83.7
    e. 91.7
    f. 94.3

11. The attributable proportion for wedding cake is:
    a. 6.1%
    b. 7.7%
    c. 68.4%
    d. 83.7%
    e. 91.7%
    f. 94.3%

12. Which of the below is defined as a measure of the frequency with which new cases of illness, injury, or other health condition occur, expressed explicitly per a time frame?
    a. Incidence rate
    b. Mortality rate
    c. Prevalence rate
    d. Proportionate morbidity ratio

13. Measles is a highly contagious disease and is spread from person-to-person by respiratory droplet nuclei that may remain infectious and suspended in the air for as long as 30 minutes after the source has left the area.This represents which of the below modes of transmission?
    a. Airborne
    b. Direct
    c. Droplet spread
    d. Vector borne

14. British investigators conducted a study to compare measles-mumps-rubella (MMR) vaccine history among 1,294 children with pervasive development disorder (e.g., autism and Asperger's syndrome) and 4,469 children without such disorders. (They found no association.) This is an example of which type(s) of study?
    a. Case-control
    b. Cohort
    c. Clinical Trial
    d. Experimental
    e. Observational

15. A cohort study differs from a case-control study in that:
    a. Cohort studies require many years to conduct, but case-control studies do not
    b. Cohort studies are conducted to investigate chronic diseases, case-control studies are used for infectious diseases
    c. Subjects are asked about their exposure status in a cohort study but not in a case-control study
    d. Subjects are enrolled or categorized on the basis of their exposure status in a cohort study but not in a case-control study

16. A key feature of a cross-sectional study is that (select all that apply):
    a. It is limited to health exposures and behaviors rather than health outcomes
    b. It is more useful for descriptive epidemiology than it is for analytic epidemiology
    c. It is synonymous with survey
    d. It usually provides information on prevalence rather than incidence

17. The epidemiologic triad of disease causation refers to: (Choose one best answer)
    a. Agent, host, environment
    b. John Snow, Robert Koch, Kenneth Rothman
    c. Source, mode of transmission, susceptible host
    d. Time, place, person

18. Investigators reviewed hospital records and selected a group of patients who were admitted for a variety of reasons but became infected with Methicillin resistant Staphylococcus aureus (MRSA) while in the hospital. They then selected a group of patients who were admitted for the same reasons and became infected with regular Staphylococcus aureus. They compared death rates among the two groups of patients. This is an example of which of the below study types? (select all that apply)
    a. Case-control
    b. Clinical trial
    c. Experimental
    d. Observational

Health care providers caring for Ebola patients and family and friends who are in close contact with these patients are at the highest risk for getting sick because they might come in contact with infected blood or body fluids of sick patients.

During Ebola outbreaks, disease can spread quickly within health care settings (e.g., clinic or hospital). Exposure to Ebola can occur in health care settings where hospital staff are not wearing correct personal protective equipment, including masks, gowns, gloves, and eye protection.

Dedicated medical equipment (preferably disposable) should be used by health care personnel providing patient care. Thorough cleaning and disposal of instruments (e.g., needles and syringes) is also important. If instruments are not disposable, they must be sterilized before reuse. Without adequate instrument sterilization, virus transmission can continue and amplify an outbreak. After a person recovers from Ebola, they can no longer spread the virus.

19. Contact tracing is an important part of efforts to control an Ebola epidemic. On the basis of what you have read with the previous information, which of the following would be the lowest priority person to contact?
    a. A health care worker in a poorly equipped hospital who cared for patients with Ebola infection.
    b. The spouse of a person with Ebola infection.
    c. A patient in a poorly equipped hospital treating multiple patients with Ebola virus.
    d. The neighbor of a person with Ebola infection.

On March 24, 2014, CDC issued the following outbreak update:

According to the World Health Organization (WHO), the Ministry of Health (MoH) of Guinea has reported an outbreak of Ebola hemorrhagic fever in four southeastern districts: Guekedou, Macenta, Nzerekore and Kissidougou. Reports of suspected cases in the neighboring countries of Liberia and Sierra Leone are being investigated. In Guinea, a total of 86 suspected cases, including 59 deaths (case fatality ratio: 68.5%), had been reported as of March 24, 2014. Preliminary results from the Pasteur Institute in Lyon, France suggest Zaire ebolavirus as the causative agent. Médecins sans Frontières (MSF/Doctors without Borders) is helping the Ministry of Health of Guinea in establishing Ebola treatment centers in the epicenter of the outbreak. CDC is in regular communication with its international partners WHO and MSF regarding the outbreak, to identify areas where CDC subject matter experts can contribute to the response.

You are one of the CDC subject matter experts asked to contribute to the response. You are on a flight to Guinea and access the following information about Guinea from the U.S. State Department website.

The U.S. State Department describes Guinea as "a developing country in western Africa with minimal facilities for tourism. Travelers who plan to stay in Conakry, the capital, should make reservations well in advance. French is the official language; Pular, Malinké, and Soussou are also widely spoken." The website indicates that "Medical facilities are poorly equipped and extremely limited, both in the capital city and throughout Guinea. Medicines are in short supply and of questionable quality, sterility of equipment should not be assumed, and treatment is frequently unreliable. Some private medical facilities provide a better range of treatment options than public facilities, but are still well below western standards. Ambulance and emergency rescue services are extremely limited in Conakry and practically non-existent in the rest of the country."

Figure 2. Map of Guinea Source: U.S. State Department (http://travel.state.gov/content/passports/english/country/guinea.html).

Part of your preparation to go to the field includes reviewing what is known about Ebola virus infections. You review 2 early reports from the Bulletin of the World Health Organization. The first report describes 218 cases of acute viral hemorrhagic fever in southern Sudan during June–November 1976. The second report discusses 318 cases in Zaire during September–October 1976. Although both outbreaks occurred at approximately the same time, testing has indicated different strains were involved, and they appear to be unrelated.

The index case in the Zaire outbreak involved a man aged 44 years who was an instructor at the Yambuku Mission School. He had symptom onset beginning September 1, 1976, after receiving an injection of chloroquine for presumptive malaria at the outpatient clinic at Yambuku Mission Hospital (YMH). Within a week, multiple YMH patients became ill. The 120-bed hospital was closed on September 30, after 11 of 17 staff had died from the illness. Investigators from WHO and other groups conducted active surveillance and a series of investigations. During November–December, 10 teams of 4 persons each visited 550 villages and interviewed 34,000 families. They collected serum specimens from persons in villages in the epidemic area if the person reported acute febrile illness during the epidemic period and had been in contact with a probable case, and from all volunteers in 8 villages, each of which had ≥5 probable cases.

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20. WHO and other groups conducted active surveillance. Which of the following determines if surveillance is active or not?
    a. The type of information that is collected.
    b. The source of information that is collected.
    c. How the information is analyzed.
    d. How the information is collected.

Another 6 teams visited all villages reporting possible cases to the surveillance teams and gathered detailed information. They selected a group of control subjects, meaning persons from the same village as probable case-patients and, if possible, matched by age and sex with a probable case-patient in the same family.

21. What study design was used for the investigation?
    a. Case-control
    b. Clinical trial
    c. Experimental
    d. Observational

22. A group of tourists on a weeklong bus tour of a European country experienced an outbreak of norovirus. The group had followed a consistent meal time pattern: each morning they had breakfast together in whichever hotel they had stayed from 6:00 a.m. to 7:00 a.m., stopped for lunch from 1:00 p.m. to 2:00 p.m., then had dinner together either at the next hotel or at a restaurant at about 7:00 p.m. The incubation period for norovirus is about 24-48 hours, with a median of about 33 hours. On which day and at which meal was exposure most likely?
    a. April 19 Dinner
    b. April 20 Breakfast
    c. April 20 Lunch
    d. April 20 Dinner
    e. April 21 Breakfast

23. The key feature of an analytic (epidemiologic) study is: (Select only one answer)
    a. Analysis by time, place, and person
    b. Calculation of a risk ratio or odds ratio
    c. Presence of a comparison group
    d. Use of Epi Info to analyze the data

Lassa fever is transmitted among humans by contact with urine or droppings from rodents and causes a hemorrhagic fever with symptoms similar to that of Ebola. You know from your past experience that lead is an element on the periodic table that is often associated with mining activities in developing countries. You quickly grab a reference book and read about lead poisoning.

24. Identify whether the given epidemiologic observations or phenomena is a characteristic of communicable diseases with person-to-person transmission such as Lassa fever, a characteristic of environmental problems such as lead poisoning, a characteristic of both, or a characteristic of neither.
Similar illness in other household members.
    a. Characteristic of Communicable Disease
    b. Characteristic of an Environmental Problem
    c. Characteristic of Both
    d. Characteristic of Neither

Characteristics of probable and suspected cases of acute lead poisoning in select LGAs (Jan 1—June 1, 2010), Kano State, Nigeria.

	Died (N=78)		Alive (N=179)		
	No.	%	No.	%	Case fatality rate
Age group					
<5	72	92.3	103	57.5	41.1%
5-15	6	7.7	35	19.6	14.6%
>15	0	0.0	41	22.9	0%
Total	78	100	179	100	30.4%

25. Which of the following statements about the information in Table 1 is true?
    a. Children less than 5 were 27 times more likely to die than those between 5 and 15 years of age.
    b. Children less than 5 years of age were the most likely to die from this illness.
    c. Adults are over 50% of the affected population.
    d. Adults appear to have been exposed as much to whatever caused the illness as young children.

ANSWER KEY

1. **B**
2. **B**
3. **B**
4. **D**
5. **B, C**
6. **A, C, D**
7. **D**
8. **A, B, C, D**
9. **C**
10. **A**
11. **D**
12. **A**
13. **A**
14. **A, E**
15. **D**
16. **B, D**
17. **A**
18. **D**
19. **D**
20. **D**
21. **A**
22. **D**
23. **C**
24. **C**
25. **B**