Multiple choice questions

1. Circle the most appropriate explanation on “Prevalence rate”:
   a. the number of patients who have the disease at a particular time, divided by the population at risk of having the disease at that time.
   b. the number of new cases of a disease in a population over a period of time.
   c. not useful for developing HIV/AIDS control programme.
   d. useful for developing Avian flu control programme.
   e. not useful for any disease control programme.

   Answer: a

2. Circle the most appropriate indication of Monthly household income in a country.

   a. Mean (± SD) e.g., US$ 10.5 (± 19.7)
   b. Only Mean e.g., US$ 10.5
   c. Only Median e.g., US$ 5.9
   d. Median (1\textsuperscript{st} quartile – 3\textsuperscript{rd} quartile) e.g., US$ 5.9 (US$ 2.5 – US$ 11.3)

   Answer: d

3. Circle type of the study design below indicated.

   An investigator takes a sample of healthy individuals, record their ongoing solar exposure, and relate that to the subsequent occurrence of skin cancer in the same group.

   a. Case-control study
   b. Ecological study
   c. Cohort study
   d. Cross-sectional study

   Answer: c

4. Which of the following is an advantage of a case-control study?

   a. There is little or no bias in assessment of exposure.
   b. Multiple disease outcomes following a selected exposure can be readily studied.
   c. Dependence on recall by subjects in the study minimized.
   d. It is possible to determine the true incidence of the disease.
e. It may be used to study etiology of a rare disease.

Answer: e

5. Which of the following is a case-control study?
   a. Analysis of previous research in different places and under different circumstances to permit establishment of a hypothesis based on cumulative knowledge of all known factors identified in the disease under study.
   b. Study collecting information from individuals to measure prevalence at one point in time.
   c. Obtaining histories and other information from a group of people with a particular disease or condition and from a group without the disease to determine the relative frequency of a past exposure under study.
   d. Defining a group of disease free people by their exposure status and then following up over time to see which ones develop a disease or condition.
   e. Study of average exposure for a group and a population measure of outcome.

Answer: c

6. A study was conducted to investigate the effect of HIV infection on mortality among people in Kenya with TB. Individuals with TB were recruited from hospitals and their HIV status determined. They were then followed-up over ten years to compare mortality rates in the HIV positive group and HIV negative group.

   a. Case-control study
   b. Cohort study
   c. Randomized controlled trial
   d. Ecological study
   e. Cross-sectional study

Answer: b

7. 100 males and 100 females who were not infected by malaria at Week 0 were followed up for 25 weeks and weekly checked for malaria infection. The result was shown in this graph. What does the graph indicate?
(b) Malaria prevalence was higher in male than in female.
(c) Malaria incidence was higher in female than in male.
(d) Malaria incidence was higher in male than in female.
(e) Survival rate was higher in female than in male.

Answer: (c)

8. We want to compare the malaria prevalence between the two villages, but sex ratio of the samples was different between the two villages. How can we analyze the effect of village on the prevalence adjusting for the effect of sex? Choose two from (a) - (e).
(a) Compare the prevalence with t test for males and females separately.
(b) Compare the prevalence with chi-square test for males and females separately.
(c) Compare the prevalence with Kaplan-Meier test for males and females separately.
(d) Perform Cox proportional hazard model with village and sex as independent variables.
(e) Perform Logistic regression model with village and sex as independent variables.

Answer: (b) and (e)

9. How can geographical information system (GIS) help disease control? Choose the incorrect answer.
(a) It can specify the high risk age group.
(b) It can help us hypothesize possible risk factors.
(c) It can evaluate the accessibility to the health service.
(d) It can specify the place for targeted control.
(e) It can visualize the spatial heterogeneity in disease burden

Answer: (a)

10. For a disease such as Ebola fever, which is highly fatal and of short duration, which of the following statements is correct?
(a) Incidence rate and mortality rate will be similar
(b) Mortality rate will be much higher than incidence rate
(c) Incidence rate will be much higher than mortality rate
(d) Incidence will be unrelated to mortality rate
(e) None of above

Answer: (a)

Short answer

1. Interpret the table.

<table>
<thead>
<tr>
<th></th>
<th>Oseltamivir phosphate</th>
<th>Placebo</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>75mg twice daily</td>
<td>twice daily for 5 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>for 5 days (n = 118)</td>
<td>(n =133)</td>
<td></td>
</tr>
<tr>
<td>Duration of symptom</td>
<td>Median 40.8 hrs</td>
<td>Median 57.9 hrs</td>
<td>p = 0.0005</td>
</tr>
<tr>
<td>diminish</td>
<td>(30.8 – 47.3)</td>
<td>(47.8 – 64.8)</td>
<td></td>
</tr>
</tbody>
</table>

( ): 95% Confidence Interval

2. In a case-control study to examine risk factors for lung cancer, cases are admitted to hospital with lung cancer, and controls are people admitted to the same hospital with emphysema (a chronic lung disease for which smoking is a risk factor). The study finds no association between smoking and lung cancer. Identify which type of error (bias, confounding, or random error) has occurred and write down why you think it occurred.
Answer: bias

The controls are more likely to be smokers than is the population that produced the cases. In an appropriate control group, the prevalence of smoking among the controls would be the same as among the population that produced the cases.

3.

Theoretically, an epidemic of an emergent infectious disease follows a simple epidemic curve shown in Figure A. However, the epidemic pattern of H1N1 influenza showed a complex curve in Okinawa, Japan in 2009-2010 (Figure B). What is the possible reason that the epidemic curve of the real world was not like that predicted from a simple mathematical model?

Examples of answer:
People's awareness, protective behavior and movement might not be constant through time.

Fluctuation in climatic conditions might affect the survivorship of virus in the environment.