

Advanced Epidemiology Knowledge Base

Epidemiology · Answer Key · 18 Questions

1. Which statistical measure in epidemiology represents the probability that an event will occur in an exposed group compared to an unexposed group, typically used in cohort studies?

A) Odds Ratio

B) Relative Risk

C) Attributable Fraction

D) Number Needed to Treat

2. In the context of the Bradford Hill criteria for causation, what does the 'Biological Gradient' refer to?

A) The consistency of findings across different studies

B) The presence of a dose-response relationship

C) The biological plausibility of the mechanism

D) The specificity of the association

3. What is the primary distinction between the 'Point Prevalence' and 'Period Prevalence' of a disease?

A) Point prevalence excludes incident cases

B) Period prevalence includes all cases occurring during a specific time interval

C) Point prevalence measures mortality rates

D) Period prevalence is restricted to chronic diseases

4. Which form of bias occurs when individuals who are selected for a study differ systematically from the target population, often arising from non-random sampling?

A) Information bias

B) Selection bias

C) Confounding bias

D) Recall bias

5. In a nested case-control study, what is the primary advantage over a standard retrospective case-control design?

A) Reduced costs in data collection

B) Exposure data is collected before disease onset

C) Ability to calculate absolute risk directly

D) Elimination of all potential confounders

6. The 'Epidemiologic Transition' theory, proposed by Abdel Omran, primarily describes the shift in patterns of:

A) Infectious to chronic, degenerative diseases

- B) Birth rates in developing nations
- C) Migratory patterns of human populations
- D) Vaccine efficacy over time

7. What is the mathematical definition of 'Attributable Risk Percent' (AR%)?

A) $(\text{Incidence in exposed} - \text{Incidence in unexposed}) / \text{Incidence in exposed}$

- B) $\text{Incidence in exposed} / \text{Incidence in unexposed}$
- C) $(\text{Incidence in exposed} - \text{Incidence in unexposed}) / \text{Incidence in population}$
- D) $\text{Incidence in unexposed} - \text{Incidence in exposed}$

8. Which bias is characterized by the systematic error caused by differences in accuracy or completeness of recall of past events by cases versus controls?

A) Detection bias

B) Recall bias

- C) Ascertainment bias
- D) Late-look bias

9. In the study of infectious diseases, what is the 'Basic Reproduction Number' (R0) defined as?

- A) The duration of the infectious period
- B) The rate of recovery in a susceptible population

C) The expected number of secondary cases produced by a single infection in a completely susceptible population

- D) The proportion of the population that is immune

10. What is the primary function of a 'Washout Period' in a randomized crossover clinical trial?

A) To increase the sample size

B) To eliminate the carry-over effect of the first intervention

- C) To allow for the washout of secondary symptoms
- D) To ensure the participants remain blinded

11. Which study design is considered the 'gold standard' for determining the efficacy of a therapeutic intervention?

- A) Cross-sectional study
- B) Ecological study

C) Randomized Controlled Trial

- D) Case series

12. What does the 'Ecological Fallacy' refer to in epidemiological research?

A) Drawing inferences about individuals based on group-level data

- B) Ignoring the influence of environment on disease
- C) Using ecological models to predict viral spread
- D) Miscalculating the prevalence of zoonotic diseases

13. The 'Hawthorne Effect' in observational studies refers to:

A) Changes in behavior resulting from the awareness of being observed

- B) The influence of seasonal variations on health outcomes
- C) Increased mortality rates due to occupational hazards
- D) The effect of genetic markers on disease susceptibility

14. In survival analysis, what is the primary purpose of a Kaplan-Meier curve?

A) To visualize the rate of recovery over time

B) To estimate the survival function from lifetime data

- C) To compare the mean ages of cases and controls
- D) To determine the population density of a pathogen

15. Which term describes the phenomenon where a factor is associated with both the exposure and the outcome, distorting the true association?

A) Effect modification

B) Confounding

- C) Synergy
- D) Interaction

16. What is 'Lead-time Bias' most commonly associated with?

A) Screening programs detecting disease earlier but not altering the natural course

- B) The duration between the onset of symptoms and treatment
- C) Misclassification of exposure status
- D) The delay in reporting infectious disease outbreaks

17. In epidemiology, what does 'Sensitivity' measure?

A) The proportion of true positives correctly identified by a test

- B) The proportion of true negatives correctly identified by a test
- C) The probability that a positive test is a true positive
- D) The total accuracy of a diagnostic tool

18. What is the defining characteristic of a 'Dynamic Population' in epidemiological surveillance?

A) A population with constant migration in and out of the cohort

B) A population where the disease rate is rapidly changing

C) A population that is strictly defined by age and gender

D) A population where no births or deaths occur during the study