EPIDEMIOLOGY AND DISEASE CYCLE

Comprehensive Review Questions

MEROHEALTHLINE

December 8, 2025

Questions and Answers

1. **Which measure of disease frequency includes all existing cases at a specific point in time?**

   A Incidence rate
   B Prevalence rate
   C Mortality rate
   D Attack rate

   Correct Answer: B
   Explanation: *Prevalence is the proportion of a population that are cases at a point in time, including both new and existing cases. Incidence refers only to new cases over a period.*

2. **The basic reproductive number (R_0) of a disease is estimated to be 0.8. What does this indicate about the epidemic potential?**

   A It will spread rapidly.
   B It will slowly die out.
   C It is in the endemic phase.
   D It is a cyclic epidemic.

   Correct Answer: B
   Explanation: *If $R_0 < 1$, the infection will not sustain itself and will die out. If $R_0 > 1$, the infection will spread.*

3. **A study compares the past exposure history of individuals with a disease (cases) to individuals without the disease (controls). What type of study is this?**

   A Cohort study
   B Randomized Controlled Trial (RCT)
   C Case-control study
   D Cross-sectional study

   Correct Answer: C
   Explanation: *Case-control studies are retrospective, starting with the outcome (disease) and looking backward for exposure.*

4. **Which level of prevention focuses on reducing the severity of disease and preventing disability in people who already have the condition?**

A Primary prevention

B Secondary prevention

C Tertiary prevention

D Primordial prevention

Correct Answer: C

Explanation: *Tertiary prevention aims to minimize long-term impact and disability through rehabilitation and palliative care. Secondary prevention focuses on early diagnosis and prompt treatment.*

5. **The time interval between the invasion by an infectious agent and the appearance of the first sign or symptom of the disease is called the:**

A Generation time

B Serial interval

C Infectious period

D Incubation period

Correct Answer: D

Explanation: *The incubation period is the time from infection to the onset of clinical symptoms.*

6. **Which component is NOT part of the Epidemiological Triad model?**

A Agent

B Host

C Environment

D Vector

Correct Answer: D

Explanation: *The Epidemiological Triad consists of Agent, Host, and Environment. A vector is a type of component within the 'Agent' or related to 'Environment'.*

7. **In a cohort study, what measure is used to quantify the association between an exposure and a disease outcome?**

A Odds Ratio (OR)

B Attributable Risk (AR)

C Relative Risk (RR)

D Case Fatality Rate (CFR)

Correct Answer: C

Explanation: *Relative Risk (or Risk Ratio) is calculated in cohort studies to compare the risk of developing a disease among exposed and unexposed groups.*

8. **What is the primary objective of 'Quarantine' in disease control?**

A Separation of sick persons from healthy persons.

B Restriction of movement of apparently healthy contacts.

C Mass treatment of entire populations.

D Disinfection of contaminated surfaces.

Correct Answer: B
Explanation: *Quarantine restricts the movement of contacts (potentially exposed, but healthy) for the longest incubation period to prevent the spread of infection if they become ill.*

9. **In statistics, the measure of central tendency least affected by extreme values (outliers) is the:**

   A Mean
   B Mode
   C Median
   D Standard Deviation

   Correct Answer: C
   Explanation: *The median is the middle value in a dataset and is therefore robust against extreme outliers, unlike the mean.*

10. **If the sensitivity of a diagnostic test is 95%, what does it mean?**

    A 95% of healthy people test negative.
    B 95% of people with the disease test positive.
    C 95% of positive results are true positives.
    D 95% of negative results are true negatives.

    Correct Answer: B
    Explanation: *Sensitivity is the proportion of true positives among all people with the disease (ability to correctly identify cases).*

11. **Which type of epidemic curve typically suggests a common source exposure that occurred once and lasted for a short period?**

    A Propagated epidemic
    B Continuous common source epidemic
    C Point source epidemic
    D Secular trend

    Correct Answer: C
    Explanation: *A point source epidemic is characterized by a sharp upward slope and a gradual downward slope, with cases occurring rapidly within one incubation period.*

12. **The term used to describe a constant presence of a disease or infectious agent within a given geographic area or population group is:**

    A Epidemic
    B Pandemic
    C Sporadic
    D Endemic

    Correct Answer: D
    Explanation: *Endemic refers to the habitual presence of a disease in a specific region.*

13. **The ratio of the number of deaths from a specific disease to the number of people who have that disease is known as:**

A Crude death rate

B Specific death rate

C Case Fatality Rate (CFR)

D Proportional mortality rate

Correct Answer: C

Explanation: *Case Fatality Rate (CFR) measures the severity of a disease by calculating the proportion of cases that result in death.*

14. When a health worker actively searches for cases in a community using house-to-house visits or symptom screening, it is called:

A Passive surveillance

B Sentinel surveillance

C Active surveillance

D Syndromic surveillance

Correct Answer: C

Explanation: *Active surveillance involves systematic and proactive searching for cases, often resource-intensive.*

15. The phenomenon where only a small percentage of total cases of a disease (the 'tip') are clinically apparent and reported, while the majority (the 'submerged part') remain hidden, is known as:

A Dark figure of mortality

B Iceberg phenomenon of disease

C Natural history of disease

D Ecological fallacy

Correct Answer: B

Explanation: *The Iceberg Phenomenon illustrates that clinical and diagnosed cases are just a fraction of the total disease burden, with the majority being subclinical, carriers, or unreported cases.*

16. Which type of study provides the highest level of evidence for establishing causality in medical interventions?

A Case series

B Cohort study

C Randomized Controlled Trial (RCT)

D Ecological study

Correct Answer: C

Explanation: *RCTs, through randomization and blinding, minimize bias and confounding, making them the gold standard for testing interventions.*

17. The transfer of an infectious agent from an infected person or animal through a vehicle (e.g., contaminated food, water, or blood) is classified as:

A Vector-borne transmission

B Airborne transmission

C Fomite-borne transmission

D Vehicle-borne transmission

Correct Answer: D

Explanation: *Vehicle-borne transmission involves an inanimate substance (the vehicle) carrying the agent to a host.*

18. A disease affecting a large proportion of the population over a wide geographic area, such as multiple continents or worldwide, is called a:

A Endemic

B Epidemic

C Pandemic

D Hyperendemic

Correct Answer: C

Explanation: *A pandemic is an epidemic that has spread across several countries or continents, usually affecting a large number of people.*

19. A newborn baby acquiring antibodies from the mother through the placenta is an example of:

A Artificial active immunity

B Natural active immunity

C Artificial passive immunity

D Natural passive immunity

Correct Answer: D

Explanation: *Natural passive immunity occurs when antibodies are transferred naturally from mother to child (e.g., placental transfer or breastfeeding).*

20. The ability of an agent to produce clinical disease in an infected host is known as:

A Pathogenicity

B Infectivity

C Virulence

D Antigenicity

Correct Answer: A

Explanation: *Pathogenicity is the ability to cause disease. Infectivity is the ability to enter, survive, and multiply. Virulence is the severity of the disease caused.*

21. Which statistical measure represents the degree of spread or dispersion in a set of data?

A Mean

B Median

C Mode

D Standard Deviation

Correct Answer: D

Explanation: *The Standard Deviation measures the average amount of variability or dispersion of data points from the mean.*

22. The elimination of all disease-causing organisms from an inanimate surface is called:

A Asepsis
B Sterilization
C Disinfection
D Antisepsis

Correct Answer: C
Explanation: *Disinfection destroys most pathogenic microorganisms on inanimate objects. Sterilization destroys ALL microorganisms.*

23. The ratio of infant deaths (under 1 year) to 1,000 live births in a given year is the:

A Crude Birth Rate
B Neonatal Mortality Rate
C Infant Mortality Rate (IMR)
D Perinatal Mortality Rate

Correct Answer: C
Explanation: *IMR specifically measures deaths in children under one year per 1,000 live births.*

24. The long-term movement in the occurrence of a disease over decades is termed as:

A Cyclic fluctuation
B Seasonal fluctuation
C Secular trend
D Time-series analysis

Correct Answer: C
Explanation: *Secular trends show changes in disease frequency over long periods (e.g., decades), often reflecting changes in lifestyle or public health interventions.*

25. What is 'Health' defined as according to the WHO constitution?

A Absence of disease or infirmity.
B A state of complete physical, mental and social well-being.
C The ability to function normally in daily life.
D The opposite of sickness.

Correct Answer: B
Explanation: *WHO defines health as 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.'*

26. Bias that occurs when participants selected for a study are not representative of the target population is called:

A Information bias
B Recall bias
C Selection bias
D Interviewer bias

Correct Answer: C
Explanation: *Selection bias results from the selection procedure, where the relationship between exposure and disease is different for those who participate vs. those who were eligible.*

27. **The study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems, is the definition of:**

    A Biostatistics
    B Public Health
    C Demography
    D Epidemiology

Correct Answer: D
Explanation: *This is the classic definition of Epidemiology.*

28. **The number of new cases of Tuberculosis reported in Kathmandu in 2024 per 100,000 population is an example of:**

    A Prevalence rate
    B Period prevalence
    C Incidence rate
    D Case fatality rate

Correct Answer: C
Explanation: *New cases over a specified period (2024) divided by the population at risk is the definition of incidence rate.*

29. **Which type of immunity is achieved by administering pre-formed antibodies (e.g., antitoxin) to a non-immune person?**

    A Natural active
    B Artificial active
    C Natural passive
    D Artificial passive

Correct Answer: D
Explanation: *Artificial passive immunity involves the injection of antibodies (passive) that were externally produced (artificial).*

30. **A non-living object that can transmit an infectious agent is called a:**

    A Reservoir
    B Vector
    C Fomite
    D Zoonosis

Correct Answer: C
Explanation: *A fomite is an inanimate object (e.g., clothes, towels, utensils) capable of transmitting infectious organisms.*

31. **The epidemiological process of 'person, place, and time' is characteristic of which part of a disease investigation?**

A Analytical epidemiology

B Descriptive epidemiology

C Experimental epidemiology

D Evaluation

Correct Answer: B

Explanation: *Descriptive epidemiology characterizes the distribution of health states in terms of who (person), where (place), and when (time).*

32. If a screening test has high specificity, it means the test:

A Rarely gives a false negative result.

B Rarely gives a false positive result.

C Is highly sensitive.

D Is easy to administer.

Correct Answer: B

Explanation: *High specificity means a high proportion of true negatives (correctly identifying those without the disease), thus minimizing false positives.*

33. The process of removing cases from the denominator population as they are identified and isolated is known as:

A Randomization

B Adjustment

C Culling

D Contingency

Correct Answer: C

Explanation: *Culling, often used in animal health epidemiology, refers to the selective removal of diseased or exposed individuals from the population to limit transmission.*

34. The stage in the natural history of disease that corresponds to the time before the onset of symptoms but after exposure is the:

A Stage of disability

B Pre-pathogenesis stage

C Subclinical stage

D Clinical stage

Correct Answer: C

Explanation: *The subclinical or presymptomatic stage is the period between exposure and the appearance of the first signs of disease (the incubation period).*

35. Which measure is used to compare mortality experience between two populations with different age structures?

A Crude rate

B Specific rate

C Standardized rate

D Proportional rate

Correct Answer: C
Explanation: *Standardization (either direct or indirect) is used to remove the confounding effect of age or other structural differences when comparing populations.*

36. The percentage of a population that is immune to a disease such that the disease cannot spread due to the lack of susceptible hosts is called:

A Primary immunity
B Herd immunity
C Community immunity
D Vaccine efficacy

Correct Answer: B
Explanation: *Herd immunity protects the entire community, including those who are not immune, by breaking the chain of transmission.*

37. What is the primary reservoir for Measles virus?

A Pigs
B Monkeys
C Humans
D Mosquitoes

Correct Answer: C
Explanation: *Measles is an exclusively human disease; humans are the only known reservoir.*

38. Which type of data collection involves interviews, focus groups, and observation to understand underlying reasons and opinions?

A Quantitative data
B Qualitative data
C Primary data
D Secondary data

Correct Answer: B
Explanation: *Qualitative data focuses on non-numerical aspects to gain in-depth understanding of motivations and experiences.*

39. The statistical range is calculated as:

A The average of the data set.
B The difference between the highest and lowest values.
C The middle value in the data set.
D The most frequently occurring value.

Correct Answer: B
Explanation: *The range is a simple measure of dispersion, calculated by subtracting the minimum value from the maximum value.*

40. The number of live births per 1,000 population in a given year is the:

A Total Fertility Rate (TFR)
B Gross Reproduction Rate (GRR)

C Crude Birth Rate (CBR)

D General Fertility Rate (GFR)

Correct Answer: C

Explanation: *CBR is the total number of live births per 1,000 people (mid-year population).*

41. A confounding factor in an epidemiological study is one that:

A Is the direct cause of the disease.

B Is associated with both the exposure and the outcome, but is not an intermediate step.

C Is only associated with the disease and not the exposure.

D Is randomly distributed between exposed and unexposed groups.

Correct Answer: B

Explanation: *Confounding distorts the true relationship between an exposure and an outcome because it is associated with both, independent of the exposure-outcome pathway.*

42. In the disease cycle, the 'Portal of Exit' refers to:

A The means by which an agent leaves the reservoir.

B The specific entry point into a new host.

C The stage when the host begins showing symptoms.

D The site where the agent multiplies.

Correct Answer: A

Explanation: *The Portal of Exit is the path by which the infectious agent leaves the host/reservoir (e.g., respiratory tract, feces, blood).*

43. An infant who dies between 28 days and one year of age falls under which mortality category?

A Early neonatal death

B Late neonatal death

C Post-neonatal death

D Perinatal death

Correct Answer: C

Explanation: *Post-neonatal death occurs from 28 days up to one year (11 months, 29 days).*

44. The ratio used to estimate the risk of an outcome (disease) when direct incidence data is unavailable, such as in a case-control study, is the:

A Relative Risk (RR)

B Odds Ratio (OR)

C Incidence Density

D Risk Difference

Correct Answer: B

Explanation: *The Odds Ratio (OR) is the measure of association calculated in case-control studies and is an estimate of Relative Risk.*

45. Which is an example of Primordial Prevention?

A Immunization against Measles.

B Screening for Hypertension.

C Mass media campaigns promoting healthy lifestyles in children.

D Rehabilitation for stroke victims.

Correct Answer: C

Explanation: *Primordial prevention aims to prevent the development of risk factors themselves, often by targeting entire populations (e.g., children) with health education.*

46. The difference in incidence rates between the exposed and unexposed groups in a cohort study is called:

A Relative Risk

B Population Attributable Risk

C Risk Ratio

D Attributable Risk (Risk Difference)

Correct Answer: D

Explanation: *Attributable Risk (or Risk Difference) represents the excess risk of disease due to the exposure.*

47. In data presentation, a graphical representation of the frequency distribution of a continuous variable is a:

A Bar chart

B Pie chart

C Histogram

D Scatter plot

Correct Answer: C

Explanation: *A histogram is used for continuous data, where bars are adjacent to show the continuity of the data.*

48. The period during which an infected person is capable of transmitting a disease to others is known as the:

A Latent period

B Infectious period

C Incubation period

D Generation time

Correct Answer: B

Explanation: *The infectious period (or communicable period) is the time when the host can transmit the agent.*

49. A disease outbreak that is limited to a small, localized area (e.g., a single village or school) is often referred to as:

A Pandemic

B Endemic

C Hyperendemic

D Outbreak/Localized Epidemic

Correct Answer: D
Explanation: *An outbreak is a sudden occurrence of disease greater than expected in a particular locality; it is smaller and more localized than a general 'epidemic'.*

50. The ultimate objective of any epidemiological study is:

A To achieve statistical significance.
B To calculate accurate rates and ratios.
C To find the cause of a disease.
D To control and prevent disease in the community.

Correct Answer: D
Explanation: *While finding the cause is important, the ultimate public health goal of epidemiology is the control and prevention of health problems.*