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Here are the answers to the epidemiology test questions:

1. Define epidemiology and explain its main objectives.

Epidemiology is the study of the distribution and determinants of health-related events, diseases, or health-related characteristics among populations. The main objectives of epidemiology are:

- To identify the causes of diseases and health-related events

- To describe the distribution and patterns of diseases

- To develop strategies for prevention, control, and treatment of diseases

- To evaluate the effectiveness of public health interventions

2. Differentiate between descriptive and analytical epidemiology, providing one example of each.

Descriptive epidemiology describes the distribution of disease, whereas analytical epidemiology analyzes the determinants of disease.

- Descriptive epidemiology: A study describing the age, sex, and geographic distribution of COVID-19 cases in Nigeria.

- Analytical epidemiology: A case-control study investigating the association between smoking and lung cancer.

3. Discuss the components of the epidemiologic triangle and how they interact in the spread of an infectious disease.

The epidemiologic triangle consists of:

- Agent (pathogen): The infectious agent causing the disease

- Host: The individual or population susceptible to the disease

- Environment: The external factors influencing the spread of the disease

These components interact in the spread of an infectious disease, such as COVID-19, where the virus (agent) infects a susceptible individual (host) in a crowded environment (environment).

4. Explain the concept of 'determinants' in epidemiology and give two examples of biological and environmental determinants.

Determinants are factors that influence the occurrence and distribution of disease.

- Biological determinants: Genetics, age, sex

- Environmental determinants: Climate, sanitation, socioeconomic status

Examples:

- Biological: Genetic predisposition to diabetes, age-related increase in hypertension risk

- Environmental: Poor sanitation leading to cholera outbreaks, climate change influencing malaria transmission

5. Describe the three levels of prevention in public health, and provide a real-life example for each.

1. Primary prevention: Preventing disease occurrence (e.g., vaccination against HPV)

2. Secondary prevention: Early detection and treatment (e.g., mammography screening for breast cancer)

3. Tertiary prevention: Reducing disease impact (e.g., rehabilitation for stroke patients)

6. How did John Snow contribute to the development of modern epidemiology? Describe the method he used during the cholera outbreak.

John Snow mapped cholera cases in London, identifying a contaminated water pump as the

source. He removed the pump handle, controlling the outbreak. This demonstrated the power of observational studies and environmental interventions.

7. Compare and contrast incidence and prevalence. Why is it important to understand both when studying a disease like diabetes?

Incidence: New cases of a disease over a period

Prevalence: Total cases (new and existing) at a point in time

Understanding both helps assess disease burden, plan healthcare services, and evaluate prevention strategies.

8. What are the common types of epidemiological study designs, and how does a cohort study differ from a case-control study?

Study designs: Cohort, case-control, cross-sectional, ecological

- Cohort study: Follows exposed and unexposed groups over time to assess disease risk

- Case-control study: Compares exposure history between cases and controls

9. Define and differentiate between relative risk (RR) and odds ratio (OR), including when each is typically used.

- RR: Ratio of disease risk in exposed vs. unexposed groups (cohort studies)

- OR: Ratio of odds of exposure among cases vs. controls (case-control studies)

10. Explain the role of epidemiological surveillance in managing public health. How can it help during an emerging epidemic?

Epidemiological surveillance involves monitoring disease trends, detecting outbreaks, and

informing control measures. During an emerging epidemic, surveillance helps track spread, identify risk factors, and evaluate interventions.