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EPIDEMIOLOGY TEST

Question 1: Define epidemiology and explain its main objectives.

Epidemiology is the study of the distribution and determinants of health-related states or events, including diseases. Its main objectives are to[1]:

- Identify the etiology or cause of disease and its relevant risk factors

- Determine the extent of disease (disease burden)

- Study the natural history and prognosis

- Evaluate existing and newly developed preventive and therapeutic measures

- Develop public policy

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

Descriptive Epidemiology: Focuses on describing the distribution of disease or health-related events among populations, typically answering "what," "who," "where," and "when" questions. Example: A study describing the demographic characteristics of individuals with diabetes in a specific region.

Analytical Epidemiology: Aims to identify and examine associations between risk factors and health outcomes, often answering "why" questions. Example: A case-control study investigating the relationship between physical activity and the risk of developing heart disease.

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

The epidemiologic triangle consists of:

1. *Agent*: The cause of the disease (e.g., bacteria, virus)

2. *Host*: The human or animal that harbors the disease

3. *Environment*: The external factors that facilitate disease transmission (e.g., water, air, vectors)

These components interact to produce disease when the agent is transmitted to a susceptible host through a conducive environment.

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

Determinants: Factors that influence the occurrence of disease or health outcomes.

Biological Determinants:

1. Genetic predisposition

2. Age-related susceptibility

Environmental Determinants:

3. Air pollution

4. Water quality

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

1. *Primary Prevention*: Preventing disease before it occurs. Example: Vaccination against infectious diseases.

2. *Secondary Prevention*: Detecting disease early to prevent complications. Example: Screening for breast cancer through mammography.

3. *Tertiary Prevention*: Managing disease to prevent further complications. Example: Rehabilitation programs for patients with stroke.

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

John Snow mapped the cholera cases in London, identifying a cluster around a contaminated water pump. This pioneering work in outbreak investigation and use of epidemiological mapping helped establish modern epidemiology.

Question 7: Compare and contrast incidence and prevalence. Why is it important to understand

both when studying a disease like diabetes?

Incidence: The number of new cases of a disease within a specified time period.

Prevalence: The total number of cases of a disease present in a population at a given time.

Understanding both is crucial for studying diseases like diabetes because incidence helps track the rate of new cases, while prevalence provides insight into the overall disease burden.

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

Common study designs include:

1. Cohort studies

2. Case-control studies

3. Cross-sectional studies

Cohort Study: A prospective study that follows a group of individuals with similar characteristics over time to examine the development of disease.

Case-Control Study: A retrospective study that compares individuals with a specific disease (cases) to those without the disease (controls) to identify potential risk factors.

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

Relative Risk (RR): A measure of the risk of disease in an exposed group compared to the unexposed group. Typically used in cohort studies.

Odds Ratio (OR): An estimate of relative risk used in case-control studies to measure the association between a risk factor and disease.

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

Epidemiological surveillance involves systematic collection, analysis, and interpretation of health data to track disease trends and detect outbreaks. During an emerging epidemic,

surveillance helps identify cases, track the spread of disease, and inform public health interventions to control the outbreak.