

UNIVERSITY COLLEGE HOSPITAL IBADAN

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COMMUNITY HEALTH OFFICER

EPIDEMIOLOGY AND DISEASES CONTROL

300L

1. Define Epidemiology and its Main Objectives.

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

1. Identify disease patterns and trends: Understand the frequency, distribution, and characteristics of diseases.

Example: Tracking the number of flu cases in a specific region during a particular season.

2. Determine causes and risk factors: Investigate the underlying causes and risk factors that contribute to disease development.

Example: Identifying the link between smoking and lung cancer.

3. Develop strategies for prevention and control: Use epidemiological findings to inform public health policy, develop interventions, and evaluate their effectiveness.

Example: Implementing vaccination programs to prevent infectious diseases.

2.Descriptive vs Analytical Epidemiology

1.Descriptive epidemiology : Focuses on describing the characteristics of disease outbreaks, including Person Who is affected age, sex, occupation?

Example: Identifying that a food borne illness outbreak primarily affects young children.

*Place:Where are the cases occurring (geographic location)?

Example:Pinpointing a specific restaurant as the source of a food borne illness outbreak.

*Time: When are the cases occurring (temporal trends)?

Example: Noting an increase in cases of a particular disease during a specific season.

*Disease frequency: How many cases are there (incidence, prevalence)?

Example: Calculating the incidence rate of a disease per 100,000 population.

2. Analytical epidemiology: Investigates the causes and risk factors of diseases, using statistical analysis to identify associations and test hypotheses.

Example: Conducting a case-control study to investigate the association between a particular exposure and disease.

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

*Host : The person or population affected by the disease.

Example: Individuals with weakened immune systems are more susceptible to infections.

*Agent: The cause of the disease e.g; bacteria, virus, toxin

Example: The influenza virus is the agent that causes the flu.

*Environment : The external factors that contribute to disease spread e.g; water, air, vectors.

Example: Mosquitoes (vectors) transmit malaria in certain regions.

The interaction between these components determines the likelihood of disease occurrence.

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

Determinants in Epidemiology:

Determinants refer to the factors that influence the occurrence and distribution of diseases or health-related events in populations. These factors can be biological, environmental, social, or lifestyle-related.

* Biological Determinants

Biological determinants are factors related to the biology of the individual or population that influence disease occurrence. Examples include:

1. Genetics : Inherited traits that affect disease susceptibility, such as genetic predisposition to certain cancers or genetic disorders.

2. Microbiome: The balance of microorganisms in the body, which can influence disease susceptibility and overall health.

* Environmental Determinants

Environmental determinants are external factors that influence disease occurrence. Examples include:

1. Air pollution: Exposure to poor air quality, which can increase the risk of respiratory diseases such as asthma.

2. Water quality : Access to safe drinking water, which can prevent waterborne diseases such as cholera.

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

*Primary prevention : Preventing disease before it occurs e.g; vaccination, health education.

Example: Vaccinating children against measles to prevent outbreaks.

*Secondary prevention: Detecting disease early e.g; screening, early diagnosis.

Example: Regular mammograms to detect breast cancer early.

*Tertiary prevention: Managing disease complications e.g; treatment, rehabilitation.

Example: Providing physical therapy to patients with stroke to improve mobility.

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

John Snow's investigation of the 1854 cholera outbreak in London led to the identification of a contaminated water pump as the source of the outbreak. His work:

*Mapped cases : Snow mapped the locations of cholera cases to identify the source.

Example: Snow's map showed a cluster of cases near a particular water pump.

*Identified the source: Snow identified the contaminated water pump as the source of the outbreak

Example: Snow's investigation revealed that the water pump was contaminated with sewage.

*Informed public health action: Snow's findings led to the removal of the pump, controlling the outbreak.

Example: The removal of the pump prevented further cases of cholera.

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 over a period (e.g., annual incidence rate)

Example: Calculating the number of new cases of diabetes per year.

*PREVALENCE : The total number of cases of a disease at a given time e.g; point prevalence

Example: Measuring the total number of people living with diabetes in a population.

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

*Cohort study: A study that follows a group over time to examine outcomes e.g; disease development.

Example: Following a group of smokers and non-smokers to study the development of lung cancer.

*Case-control study: A study that compares individuals with a disease to those without, to identify potential risk factors.

Example: Comparing the exposure history of individuals with lung cancer to those without.

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

used.

*Relative risk: A measure of the risk of disease in exposed vs. unexposed groups e.g; $RR = 2$ means exposed group is 2 times more likely to develop disease.

Example: Calculating the relative risk of lung cancer in smokers vs. non-smokers.

*Odds ratio: A measure of the association between exposure and disease e.g; $OR = 2$ means exposed group has 2 times the odds of developing disease.

Example: Calculating the odds ratio of developing lung cancer in smokers vs. non-smokers.

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 and patterns to inform public health action. It helps during emerging epidemics by:

- *Identifying outbreaks early : Detecting unusual patterns or increases in disease cases.

Example: Monitoring reports of influenza-like illnesses to detect potential outbreaks.

- *Informing control measures: Providing data to inform public health interventions.

Example: Using surveillance data to guide vaccination efforts during an outbreak.

*Evaluating intervention effectiveness: Monitoring the impact of control measures on disease trends.

Example: Assessing the effectiveness of vaccination programs in reducing disease incidence.