AKINLEYE TEMITOPE OLAOLUWA
CHO 300L
EPIDEMIOLOGY ASSIGNMENT.

1. Definition and Objectives of Epidemiology

Epidemiology is the study of the distribution and determinants of health-related states or events in specific populations, and the application of this study to control health problems.

Main objectives:

To identify the cause and risk factors of diseases.

To determine the extent or magnitude of disease in a population.

To study the natural history and prognosis of diseases.

To evaluate preventive and therapeutic interventions.

To provide a basis for public health policy and planning.

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2. Descriptive vs. Analytical Epidemiology

| Feature | Descriptive Epidemiology | Analytical Epidemiology |
|---|---|---|
| Purpose | Describes disease occurrence in terms of person, place, and time. | Tests hypotheses to identify associations between exposures and outcomes. |
| Focus | Patterns and trends of disease. | Causes and risk factors. |
| Example | A study showing that malaria cases are higher in rural areas during the rainy season. | A study testing whether sleeping under mosquito nets reduces malaria risk. |

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3. Components of the Epidemiologic Triangle

The epidemiologic triangle explains how infectious diseases spread through the interaction of three elements:

1. Agent – The microorganism or factor causing the disease (e.g., virus, bacteria, toxin).

2. Host – The organism (usually human) that can be infected.

3. Environment – External factors that influence disease transmission (e.g., sanitation, climate, housing).

Interaction:
For example, in malaria:

Agent: Plasmodium parasite

Host: Humans

Environment: Stagnant water allowing mosquito breeding
→ All three interact to enable transmission.

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4. Concept of Determinants in Epidemiology

Determinants are factors that influence the occurrence, distribution, and severity of health conditions. They explain why and how diseases occur.

Examples:

Biological determinants: Age, sex, genetic makeup.

Environmental determinants: Climate, water quality, housing conditions.

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5. Levels of Prevention

Level Goal Example

Primary prevention Prevent disease occurrence. Immunization against polio.
Secondary prevention Detect and treat disease early. Blood pressure screening to detect hypertension.
Tertiary prevention Reduce complications and disability. Physiotherapy for stroke patients.

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6. John Snow's Contribution to Modern Epidemiology

John Snow, known as the "Father of Modern Epidemiology," investigated the cholera outbreak in London (1854).

Method used:

He mapped cholera cases around the Broad Street water pump.

Found that most cases occurred among those who drank water from that pump.

After removing the pump handle, cholera cases declined.

This demonstrated the link between contaminated water and cholera, and introduced mapping and data analysis as epidemiologic tools.

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7. Incidence vs. Prevalence

Term Definition Formula/Focus

Incidence Number of new cases occurring in a specific period among a population at risk.

Measures risk of developing disease.
Prevalence Total number of existing cases (new + old) at a specific time. Measures burden of disease.

Importance (e.g., in diabetes):

Incidence helps identify new risk factors or trends in new cases.

Prevalence shows overall disease burden, guiding resource allocation and long-term care planning.

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8. Common Types of Epidemiological Study Designs

Descriptive studies: Case reports, case series, cross-sectional studies.

Analytical studies: Case-control studies, cohort studies.

Experimental studies: Randomized controlled trials.

Difference:

Cohort study: Follows exposed and unexposed groups over time to compare disease incidence (prospective or retrospective).

Case-control study: Compares people with disease (cases) to those without (controls) to assess past exposures.

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9. Relative Risk (RR) vs. Odds Ratio (OR)

Measure Definition Use Interpretation

| | | |
|---|---|---|
| Relative Risk (RR) | Ratio of disease risk in exposed vs. unexposed group. RR = 2 → Exposure doubles the risk. | Cohort studies, trials. |