Al-Mustaqbal University / Nursing College
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Epidemiology

Lecture

Epidemiology

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Epidemiology

- The term is derived from the Greek words epi (upon), demos (the people), and logos (study):

- **Epidemiology definition :**

Epidemiology is “concerned with the distribution and determinants of health and diseases, morbidity, injuries, disability, and mortality in populations. and the application of the study to control of health problems.”

Historical Backgrounds of Epidemiology

- **Hippocrates:**

The Greek physician Hippocrates is sometimes said to be the father of epidemiology .He is the first person known to have examined the relationships between the occurrence and distribution of diseases and environmental influences.

- **James Lind (1700's)**

Designed first experiments to use a concurrently treated control group

- **Edward Jenner :** Pioneered clinical trials for vaccination to control spread of smallpox.
- **Louis Pasteur** who developed vaccines against rabies and other infectious diseases.

Epidemiology is concerned with three aspects

1. **Frequency (how many):** Refers not only to the number of health events such as the number of cases of meningitis or diabetes in a population, but also to the relationship of that number to the size of the population. The resulting rate allows to compare disease occurrence across different populations.

2. <u>Distribution (when and where):</u> Refers to the occurrence of health-related events by time, place, and person.

- **Time** patterns may be annual, seasonal, weekly, daily, hourly.
- **Place** patterns include geographic variation, urban/rural differences, and location of work sites or schools.
- **Personal characteristics** include demographic factors which may be related to risk of illness, injury, or disability such as age, sex, marital status, and socioeconomic status, as well as behaviors and environmental exposures.

3. <u>Determinants (risk factors and causes of disease):</u>

causes and other factors that influence the occurrence of disease and other health-related events. include factors that influence health: biological, chemical, physical, social, cultural, economic, genetic and behavioral.

Uses of epidemiology

1. To describe extents of disease
2. To know causation of disease
3. To know natural history of a disease
4. Description of health status in population
5. Health planning and identifying priorities
6. Evaluation of intervention of prevention and treatment

Sources of epidemiological information

1. **Population census:** is collection of data from every member of a population; theoretically it should provide the most reliable data.

2. Registration of vital events: Birth, death and marriage.

3. Hospital/health center records.

4. Disease registers.

5. Epidemiologic studies.

6. Publications, Electronic sources

The main types of epidemiology are **descriptive**, **analytic**, and **experimental**. Descriptive studies describe the distribution of disease, analytic studies investigate causes and risk factors, and experimental studies use controlled interventions to test hypotheses. Other types include specific areas of study, such as infectious disease, chronic disease, environmental, and social epidemiology.

Types of epidemiology

By study design

Descriptive epidemiology: Focuses on describing the distribution of a disease or health event in a population by answering who, what, where, and when. It helps generate hypotheses.

Analytic epidemiology: Tests hypotheses about the association between an exposure and a disease.

Case-control studies: Compares people with a disease to people without it to find potential causes.

Cohort studies: Follows a group of people over time to see how different exposures affect their health outcomes.

Experimental epidemiology: Involves controlled experiments to test the effect of an intervention. A common example is a randomized controlled trial (RCT)..

By area of focus

- Infectious disease epidemiology: Studies the distribution and determinants of infectious diseases.
- Chronic disease epidemiology: Investigates the causes and risk factors for chronic diseases like heart disease and cancer.
- Environmental epidemiology: Examines the health effects of environmental exposures, such as air and water pollution.
- Social epidemiology: Studies how social factors, like poverty and education, influence health outcomes.
- Clinical epidemiology: Applies epidemiological principles to clinical practice.
- Nutritional epidemiology: Investigates the role of nutrition in causing or preventing disease

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