



Al-Mustaqbal University / Nursing College
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Epidemiology



Lecture 1

Introduction to Epidemiology

By

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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 Jenner's work influenced many others, including **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.

Epidemiology is concerned with three aspects

2. **Distribution (when and where)**: 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.

Epidemiology is concerned with three aspects

3. Determinants (risk factors and causes of disease):

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**

Health-related states and events

Refer to diseases, causes of death, behaviors such as use of tobacco, positive health states, reactions to preventive regimes and provision and use of health services.

Specified populations: include those with identifiable characteristics, such as occupational groups.

Causal inference:

A major focus of epidemiology is informing efforts to prevent and control disease and promote health. To do this, we need to know the causes of disease or injury and the ways in which these causes can be modified.

Causality

Refers to the relationship between a cause and its effect. A purpose of epidemiologic study has been to discover causal relationships to understand why conditions develop and offer effective prevention and protection.

Core Epidemiologic Functions

In the mid-1980s, five major tasks of epidemiology in public health practice were identified:

- public health surveillance,
- field investigation,
- analytic studies,
- evaluation,
- linkages.

1. Public health surveillance

- surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of health data to help guide public health decision making and action.
- Surveillance is equivalent to monitoring the pulse of the community.
- One of the first actions that results from a surveillance case report or report of a cluster is investigation by the public health department.

2. Field investigation

The investigation may be as limited as a phone call to the health-care provider to confirm or clarify the circumstances of the reported case, or it may involve a field investigation requiring the coordinated efforts of dozens of people to characterize the extent of an epidemic and to identify its cause

Surveillance and field investigations are usually sufficient to identify

- Causes
- Modes of transmission
- Appropriate control and prevention measures.

3. Analytic studies

The hallmark of an analytic epidemiologic study is the use of a valid comparison group.

4. Evaluation

is the process of determining, as systematically and objectively as possible, the relevance, effectiveness, efficiency, and impact of activities with respect to established goals.

Effectiveness: refers to the ability of a program to produce the intended or expected results in the field;

Efficacy: which is the ability to produce results under ideal conditions.

Efficiency :refers to the ability of the program to produce the intended results with a minimum expenditure of time and resources.

5- Linkages :

Epidemiologists working in public health settings rarely act in isolation. In fact, field epidemiology is often said to be a “team sport.”

During an investigation an epidemiologist usually participates as either a member or the leader of a multidisciplinary team. Other team members may be laboratorians, sanitarians, infection control personnel, nurses or other clinical staff, and, increasingly, computer information specialists.

HAVE A NICE DAY

Thank you