Community Dentistry

Lec 2

Epidemiology

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Epidemiology is often described as the basic science of public health

JOHN M.LAST (1988) defined epidemiology as *"the study of distribution and determinant of health related states or events in specified populations, and application of this study to the control of health problems"* , *which is the most commonly used definition.*

- In epidemiological studies the target (human population), which can be define in geographical or other term e.g., (a specific group of hospital patients or factory workers).

Earial epidemiology meant study of epidemics and infectious disease, but in the last few decades, it has been used in the study of non-communicable disease also such as hypertension, coronary heart disease, diabetes mellitus, oral cancer, dental caries, periodontal disease, etc.

Epidemiological studies components:

Epidemiology is the study (scientific, systematic, and data-driven) of:

. * Frequency of disease, measuring the frequency, disability or death summarizing this information in form of rates &ratios. Rate are essential for comparing disease frequency in different populations or sub groups of the same population in relation to suspected causal factor.

* Distribution of disease. Study the distribution of disease occurs in patterns in community which may lead to generation of hypothesis about causative/risk factor (Descriptive dentistry).

Study distribution of disease by: Time .increase or decrease in time span

Place: more in geographical area

Person: more in particular area, sex/age group

- Determinant of disease. Epidemiology test etiological hypothesis and identify risk/cause factors of disease (Analytical epidemiology). To search for these determinants, epidemiologists use analytic epidemiology or epidemiologic studies to provide the "Why" and "How" of such events.[1]

Aims of epidemiology:

1. To minimize or eradicate the disease or health problem and its consequence.
2. To minimize the chances of its occurrence in the future.

According to the IEA (International Epidemiological Association), there are three main objectives of epidemiology:

1. To describe the distribution and magnitude of health and disease problems in human population.
2. To identify etiological /risk factor in pathogenesis of disease.
3. To provide data essential to planning, implementation and evaluation of service for the prevention, control to treatment of disease.

Epidemiological measurements:

Morbidity: is the term used to describe the percentage of a population which is suffering from a disease at a given point in time.

The principle measurements of morbidity used in epidemiology are incidence and prevalence.

Incidence rate-v-» the number of new cases occurring in a defined population during a specified period of time.

Uses of incidence rate:

1. To control disease.
2. For research in to etiology, and pathogenesis, distribution of disease and efficacy of preventive and therapeutic measure.

Prevalence-» all current cases (old and new) existing at a given point in time or over a period of time in a given population.

Uses of prevalence:

1. To estimate the magnitude and health/disease problems in community and identify potential high- risk population.
2. For administrative and planning purposes.

Tools measurement of epidemiology:

The epidemiology usually express disease magnitude as basic tools include;

I. Rate: measure of some particular event (development of disease) in population during a given time period. E.g. , death rate is calculated as

Death rate= Number of event (death or disease) in a specified period x 1000 population

In rate the numerator is a part of denominator as seen in above formula.

2. Ratio-» express a relation in size between two random quantities. The numerator is not the component of denominator. Ratio is the Result of dividing one quantity by another which is represented as this formula-» (x/y)

,e.g., the caries in boys is 90/1000, while in girls 80/1000 .so the ratio of caries is 90:80 or 9:8.

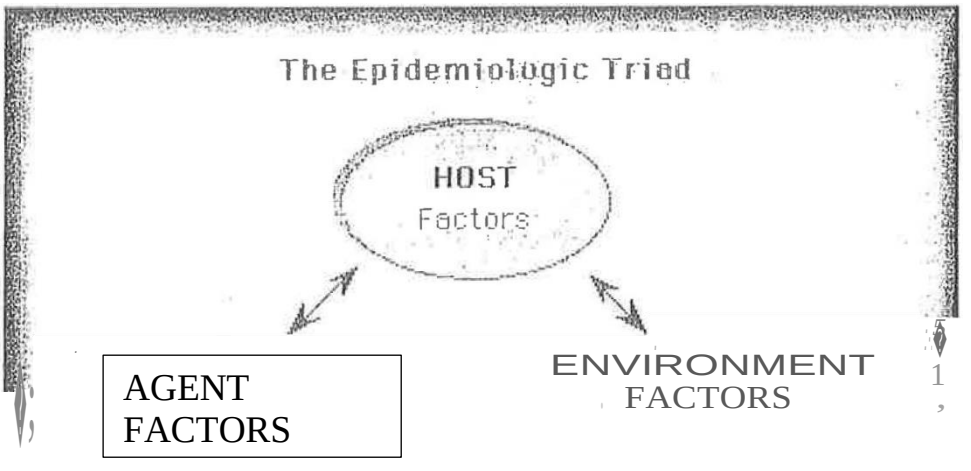
3. Proportion-» a ratio which indicates the relation in magnitude of a part of the whole. The numerator is always included in denominator. This is expressed in percentage.

=No of children with caries of *1st* molars at a certain time x100

Total number of children at the same time

The epidemiologic traid:

The triad consists of an *external agent, a host* and an *environment* in which host and agent arc brought together, causing the disease to occur in the host. *A vector, a n* organism which transmits infection by conveying the pathogen from one host to another without causing disease itself, may be part of the infectious process.



Uses of epidemiology

Epidemiology and the information generated b y epidemiologic methods have been used in many ways:

Assessing the community's health

Public health officials responsible for policy development, implementation, and evaluation use epidemiologic information as a factual framework for decision making. To assess the health of a population or community, relevant sources of data must be identified a n d analyzed b y person, p l a c e, a n d time (descriptive epidemiology)

-What are the actual and potential health problems in the community?

„Where are they occurring?

··Which populations are at increased risk?