**Family and Community Medicine**

**Epidemiological Models (Person, Place and Time)**

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**I keep six honest serving-men (They taught me all I knew );**

**Their names are:**

**What and Why and When And How and Where and Who.**

**OBECTIVES:**

* **To identify the types of epidemiology**
* **To have idea about descriptive**
* **To identify the epidemiological models person place and time**

**Two Broad Types of Epidemiology:**

1**. Descriptive Epidemiology**

Examining the distribution of disease in a population, and observing the basic features of its distribution

**2. Analytic Epidemiology**

Testing a hypothesis about the cause of disease by studying how exposures relate to the disease

**Descriptive Epidemiology**

In Descriptive Epidemiology:

Who? - person

Where? - place

When? - time

**1.Time**

In the center of the Triangle is time.

Most infectious diseases have **an incubation period:**

The time between when the host is infected and when disease signs and symptoms occur.

* Time may describe the duration of the illness or the amount of time a person can be sick before death or recovery occurs.
* Disease may occur as Annual occurrence, seasonal occurrence, and daily or even hourly occurrence of
* Knowing time trend of a disease will help health professionals to establish control measures.

**Time trend include:**

* *Secular trend (long-term)*
* *Periodic (cyclic variation*)
* *Rapid fluctuation (short time)*

***Secular (long-term) trends:***

* Graphing the annual cases or rate of a disease over a period of years (Decades or centuries) shows long-term or secular trends in the occurrence of the disease.
* We commonly use this trend to suggest or predict the future incidence of a disease.
* Secular (Long-term trend) is influenced by population features *e.g.*
* Change of degree of susceptibility e.g. by immunization
* Socioeconomic
* Environmental sanitation
* Nutritional status of a population.

**Periodic (cyclic variation)**

Where disease occurrence for a period then increase again in cyclic pattern *e.g. measles*in pre vaccination era occur every 2 – 3 years

**Seasonality:**

By graphing the occurrence of a disease by week or month over the course of a year or more we can show its seasonal pattern   
 Example:   
Cases of influenza increases in winter.    
Food poisoning and diarrhea increase in summer

**Rapid fluctuation (short time)**

Usually occur in the form of point source epidemics that appear abruptly and end abruptly either natural or due to intervention.

e.g. food poisoning

**II- Place characteristics** Disease may change by:

* place of residence,
* birth place,
* place of employment,
* School district,
* hospital unit, etc.

**Five Criteria of Place**

* increase Rate observed in all ethnic groups in the area
* increase Rate NOT observed in persons of similar groups inhabiting other areas
* Healthy persons entering area get ill at same frequency
* People who leave do NOT show similar levels
* Similar levels of infestation in other species (if zoonotic disease)

e.g. Malaria in the north of Iraq.

**Place characteristics**

* Analyzing data by place can give an idea of where the agent that causes a disease lives and multiplies,
* what may carry or transmit it, and how it spreads.
* Use spot map to locate the possible source or risk factors.
* Geography
* Geology
* Chemical and physical environment
* Environmental sanitation
* Availability of Health Services

**III- Person characteristics**

In descriptive epidemiology, we also organize or analyze data by “person” characteristics such as:

age, race, sex, marital status, socioeconomic status, as well as behaviors and environmental exposures.

**Age:**

* Age is probably **the single most important “person” attribute**, because almost every health-related event or state varies with age.
* Age affects: Type of disease: e.g.
* Neonates ----- congenital anomalies and birth trauma
* Elderly ------ Degenerative diseases, CVD
* Severity of disease:
* Whooping cough is severe under one year
* Pneumonia is fatal in early 2 months
* Fracture is severe in old age
* Clinical form of disease:
* Thyroxine deficiency ---- cretinism in children----Myxodema in adults
* T.B. ------ primary and Miliary in children----- post primary Pulmonary in adults
* Explanation of disease variation by age may be explained by:
* exposure to risk factors
* degree of immunity or susceptibility
* response to a causative agent.

***Sex:***

* Some diseases are sex-linked due to: anatomic differences e.g. cancer cervix , cancer prostate
* Genetic differences between the sexes e.g. Hemophilia which an X linked recessive disease.
* Other diseases are related to occupations and environmental exposure which differ in both sexes. E.g. accidents and lung diseases more in male than female due to more exposure.

**Ethnic and racial groups:**

* Ethnic group: any group of people who have lived together long enough to acquire common characteristics, either biologically or socially.
* Some races are susceptible to specific diseases e.g. sickle cell anemia in Negros due to genetic predisposition
* Some races got immunity due to long exposure

**Familial tendency**

Clustering of some diseases within certain families may be due to:

* Genetic factors, or
* common exposure to the same dietetic, social, psychological and environmental influences.

**Religion**

Religion usually determine the behavior of its followers

* Alcohol ----- liver disease
* Male circumcision------ may relate to carcinoma???

**Socioeconomic status:**

Socioeconomic status is measured by:

* Education ---- health behavior
* Occupation ----- income
* Family income ---- environmental condition, housing conditions, access to health facilities

**Occupation**

* Determine the occupational exposure to certain risk factors in work place.
* Occupation is also one of the determinant of socioeconomic class which affects the disease occurrence (nutritional diseases, filth diseases,….
* Doctors at high risk of exposure to communicable diseases .

**Sporadic level:** occasional cases occurring at irregular intervals

**Endemic level:** persistent occurrence with a low to moderate level

**Epidemic or outbreak**: occurrence clearly in excess of the expected level for a given time period

**Pandemic:** epidemic spread over several countries or continents, affecting a large number of people

