

Disease Causation

Cause of disease: is an event, condition, characteristic or a combination of these factors which plays an important role in producing the disease .

The causes of disease can be classified in to two :

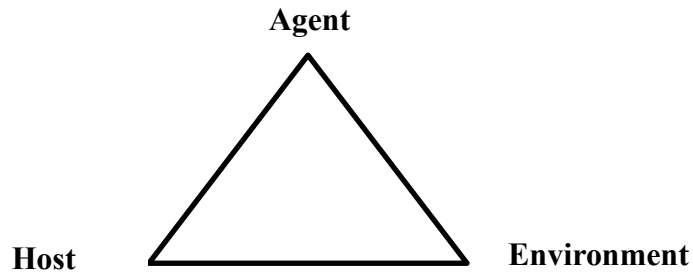
1 **.Primary causes** – these are the factors which are necessary for a disease to occur, in whose absence the disease will not occur. The term” etiologic agent” can be used instead of primary cause for Infectious causes of diseases. For example, *Mycobacterium tuberculosis*” is the primary cause (etiologic agent) of pulmonary tuberculosis .

2 **.Risk factors** (contributing, predisposing, or aggravating factors). These are not the necessary causes of disease but they are important for a disease to occur. A factor associated with an increased occurrence of a disease is risk factor for the exposed group; and a factor associated with a decreased occurrence of a disease is a risk factor for the non-exposed group. Risk factors could be related to the agent, the host and the environment.

So the etiology of a disease is the sum total of all the factors (primary causes and risk factors) which contribute to the occurrence of the disease.

It is the interaction of the agent, the host, and the environment which determines whether or not a disease develops, and this can be illustrated using the epidemiologic triangle.

The epidemiologic triangle, depicts the relationship among three key factors in the occurrence of disease or injury: agent, environment ,and host.



An agent is a factor whose presence or absence, excess or deficit is necessary for a particular disease or injury to occur. The causative agent may be biological, chemical, physiological, nutritional, mechanical, psychological.

The environment includes all external factors, other than the agent, that can influence health. These factors are further categorized according to whether they belong in the social, physical, or biological environments.

The social environment encompasses a broad range of factors, including education, unemployment, culture regarding diet; and many other factors pertaining to political, legal, economic, communications, transportation, and health care systems.

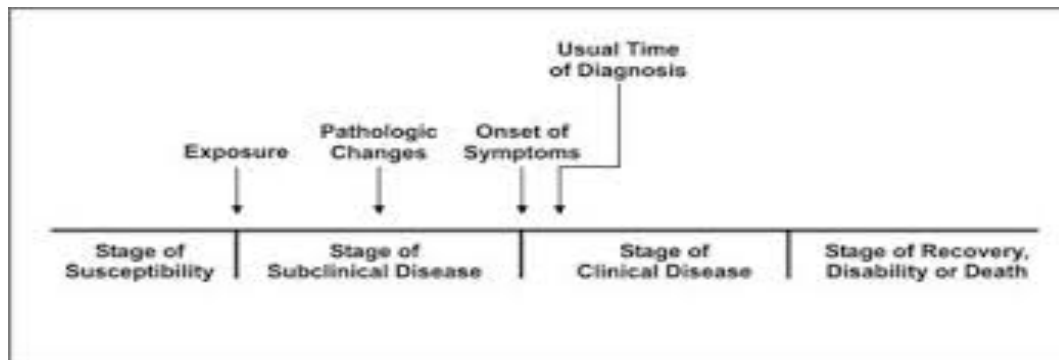
Physical environmental factors are factors like climate, terrain, and pollution.

Biological environmental influences include vectors, humans and plants serving as reservoirs of infection.

Natural history of disease

The “natural history of disease” refers to the progression of disease process in an individual over time, in the absence of intervention. There are four stages in the natural history of a disease. These are :

- 1 .Stage of susceptibility
- 2 .Stage of pre-symptomatic (sub-clinical) disease
- 3 .Stage of clinical disease
4. Stage of disability or death



1 .Stage of susceptibility

In this stage, disease has not yet developed, but the groundwork has been laid by the presence of factors that favor its occurrence. Like unvaccinated child is susceptible to measles .

2 .Stage of pre-symptomatic (sub-clinical) disease

In this stage there are no manifestations of the disease but pathologic changes (damages) have started to occur in the body. The disease can only be detected through special tests since the signs and symptoms of the disease are not present like detection of antibodies against HIV in an apparently healthy person, ova of intestinal parasite in the stool of apparently healthy children .

The pre-symptomatic (sub-clinical) stage may lead to the clinical stage, or may sometimes end in recovery without development of any signs or symptoms .

3 .The Clinical stage

At this stage the person has developed signs and symptoms of the disease. The clinical stage of different diseases differs in duration, severity and outcome. The outcomes of this stage may be recovery ,disability or death . Like Common cold has a short and mild clinical stage and almost everyone recovers quickly while Polio has a severe clinical stage and many patients develop paralysis becoming disabled also Rabies has a relatively short but severe clinical stage and almost always results in death .Diabetes Mellitus has a relatively longer clinical stage and eventually results in death if the patient is not properly treated .

4 .Stage of disability or death

Some diseases run their course and then resolve completely either spontaneously or by treatment. In others the disease may result in a residual defect, leaving the person disabled for a short or longer duration. Still, other diseases will end in death .

Disability is limitation of a person's activities Like Trachoma may cause blindness, Meningitis may result in blindness or deafness. Meningitis may also result in death.

Levels of Disease Prevention

The major purpose in investigating the epidemiology of diseases is to learn how to prevent and control them. Disease prevention means to interrupt or slow the progression of disease

There are three levels of prevention

1. **Primary prevention:** -The main objectives of primary prevention are promoting health, preventing exposure and preventing disease.

A. **Health promotion:** - consists of general non-specific interventions that enhance health and the body's ability to resist disease. Improvement of socioeconomic status ,provision of adequate food, housing, clothing, and education are examples of health promotion .

B. **Prevention of exposure:** - is the avoidance of factors which may cause disease if an individual is exposed to them. As provision of safe and adequate water ,proper excreta disposal, and vector control .

C. **Prevention of disease:** - is the prevention of disease development after the individual has become exposed to the disease-causing factors. Immunization is an example of prevention of disease.

2. **Secondary prevention:** - The objective of secondary prevention is to stop or slow the progression of disease and prevent or limit permanent damage. Secondary prevention can be achieved through detecting people who already have the disease as early as possible and treat them.

- Early detection and treatment of breast cancer to prevent its progression to the invasive stage, which is the severe form of the disease.

3. **Tertiary prevention:** – is targeted towards people with permanent damage or disability. Tertiary prevention is needed in some diseases because primary and secondary preventions have failed, and in others because primary and secondary prevention are not effective. It has two objectives :

- Treatment to prevent further disability or death and
 - To limit the physical, psychological, social, and financial impact of disability, thereby improving the quality of life. This can be done through rehabilitation such as when a person becomes blind due to vitamin A deficiency, tertiary prevention (rehabilitation) can help the blind or partly blind person learn to do gainful work and be economically self-supporting.

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