

# Natural History of disease and Prevention

## Lecture 2

**Health:** The concept health may mean different things for different people. Health may simply mean the absence of disease or it may mean the soundness of body.

The World Health Organization (WHO 1984) defined health as “ **A state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity.**”

The main problem with this definition, is the lack of agreement on the meaning of the term” complete” which remained difficult to quantify but encouraged almost all countries to work towards the improvement of the health of their people.

A more practical definition of health may be as follows: Health is a state of successful adaptation of the body to stresses and stimuli to which it is subjected. :

The successful adaptation may be very optimal and the attributes of optimal health are:

1. Anatomical integrity to ensure the physical aspect of health.
2. Ability to do normal duties at personal, family and community level.
3. Ability to deal with stress whether this stress is physical, mental or social.
4. Feeling of well being. This is the mental or psychological dimension of health.
5. Freedom from disease and premature death.
6. Spiritual and moral stability

**Disease** (Dis- ease) is failure of the adaptive mechanism of the body to overcome external stress and stimuli to which it is exposed, resulting in abnormal structure and / or function of one or more of its tissues, organs or systems. Such abnormality is either reversible or irreversible.

### **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.

What are the Stages in the natural history of a disease? There are four stages:

1. Stage of susceptibility
2. Stage of pre-symptomatic (sub-clinical) disease
3. Stage of clinical disease
4. Stage of recovery , 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.

Example: 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.

Examples:

- 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.

Examples:

- Common cold has a short and mild clinical stage and almost everyone recovers quickly.
- *f* Polio has a severe clinical stage and many patients develop paralysis becoming disabled for the rest of their lives.
- *f* Rabies has a relatively short but severe clinical stage and almost always results in death.
- *f* Diabetes Mellitus has a relatively longer clinical stage and eventually results in death if the patient is not properly treated.

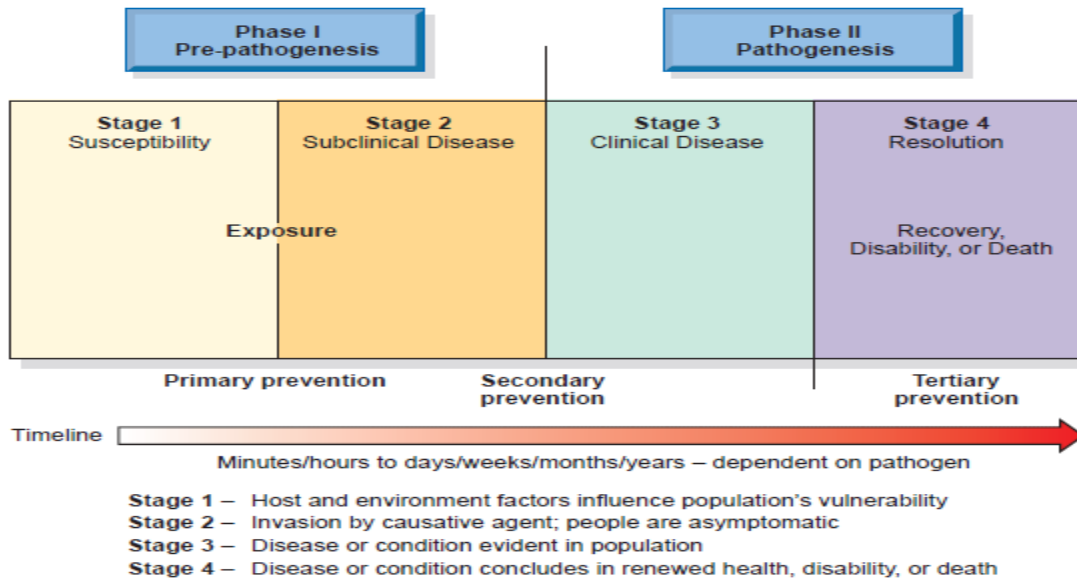
### 4. Stage of recovery, disability or death

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 including his role as a parent, wage earner, etc

Examples:

- Trachoma may cause blindness
- Meningitis may result in blindness or deafness. Meningitis may also result in death.

## The natural history of disease



## PREVENTION

Prevention is to make the occurrence of some thing like disease, accident, which is anticipated, impossible.

This can be achieved at three levels (levels of prevention):

### 1- Primary prevention

All measures that are applicable before the onset of disease through health promotion and specific protection.

**1- Health promotion.** “The process of enabling people to increase control over their health and its determinants, and thereby improve their health”. Health promotion consists of all the activities which are not aimed at any specific diseases but serve to improve the host factor in epidemiologic triangle.

1. Health education.
2. Environmental modification (reducing air pollution, safe water, sanitary latrines, control of insects and rodents, improving housing).
3. Engineering lifestyle (antismoking campaign.).
4. Genetic and marriage counseling (to prevent congenital diseases, i.e. Thalassaemia).

5. Increasing the standard of living (i.e. the income, education and occupational status).
6. Health legislation, i.e. forming rigid standards of health care, sanitation and issues relating to health

**2. Specific protection.** The measures which target particular diseases. The idea of specific protection, especially that killer diseases could be stopped by simple interventions such as

- 1- Immunization.
- 2- Nutrient supplementation (vitamin A, iodine).
- 3- Chemoprophylaxis (prior medication to at risk population).
- 4- Protection against occupational hazards (masks for workers).
- 5- Avoiding allergens (for asthmatics).
- 6- Quality control of consumer products (salt—For iodine deficiency diseases, drugs—To avoid adverse drug reactions, cosmetics—To avoid allergy).

## **2- Secondary prevention**

This is applied after the onset of disease through early detection and prompt treatment of disease.

### **• Early detection**

1. Screening tests are done in healthy population of a community.
2. Case finding means diagnosing something else in patient other than his chief complaint.
3. Special medical examination of risk groups.

### **• Prompt treatment:**

A quick cure, helps the patient as well as stops further spread of disease.

Disadvantages of secondary prevention:

Secondary prevention has **the disadvantages** of being more expensive, less effective in prevention/relief and it fail to prevent loss of productivity to community – as the individual is already diseased.

Advantages of secondary prevention:

Secondary prevention **advantages** it may reduce the length of illness, the length of infectiousness, the risk of complications and the economic losses by the individuals, their families and the society at large.

### 3- Tertiary prevention

through limitation of disability and rehabilitation. There are four dimensions of rehabilitation

1. Medical: If possible restoration of function (i.e physiotherapy)
2. Vocational: Restoration of capacity to earn a livelihood (training and creating jobs)
3. Social: Reintroduction into family, kins and society as a whole and involving everyone to maintain the same relationship with this person.
4. Psychic: Restoration of self-esteem and confidence.

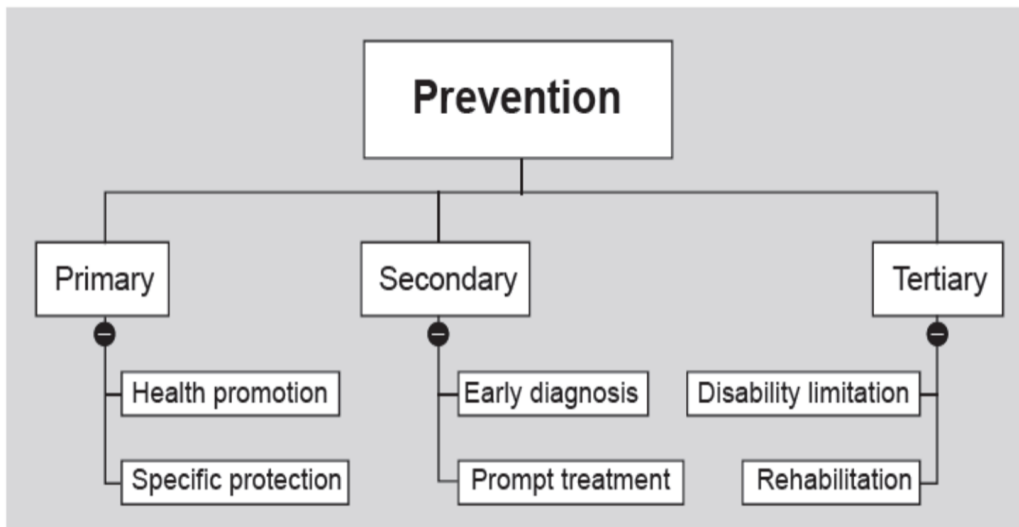


Figure 1.6. Three levels of prevention