# Introduction to Public Health
# Module # 3

## Concept of disease prevention and its effective approach.

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# OBJECTIVES OF THE LECTURE

***By the end of this lecture you will be able to:***

- *Identify measures for prevention and control of communicable diseases*
  - *Measures towards reservoir*
  - *Measures towards the MOT /environment*
  - *Measures to contacts and susceptible host*
- *Identify the levels of prevention of diseases*

# PREVENTION

- Is a process of protection some one from getting any health problems.

# Prevention

- Anticipatory action taken to
  - Reduce the possibility of an event **or** Condition occurring or developing, **or**
  - Minimize the damage that may result from the event or condition if it does occur (Pickett & Hanlon, 1990)

# Determinants of Prevention

- Successful prevention depends upon:
  - A knowledge of causation
  - Dynamics of transmission
  - Identification of risk factors and risk groups
  - Availability of early detection and treatment measures
  - An organization for applying these measures to appropriate persons or groups and
  - Continuous evaluation of and development of procedures applied

# *Prevention*

*Actions aimed at eradicating, eliminating, or minimizing the impact of disease and disability, or if none of these is feasible, retarding the progress of disease and disability.*

*The concept of prevention is best defined in the context of levels of prevention; primary, secondary, and tertiary prevention.*

*(Oxford Dictionary 2008)*

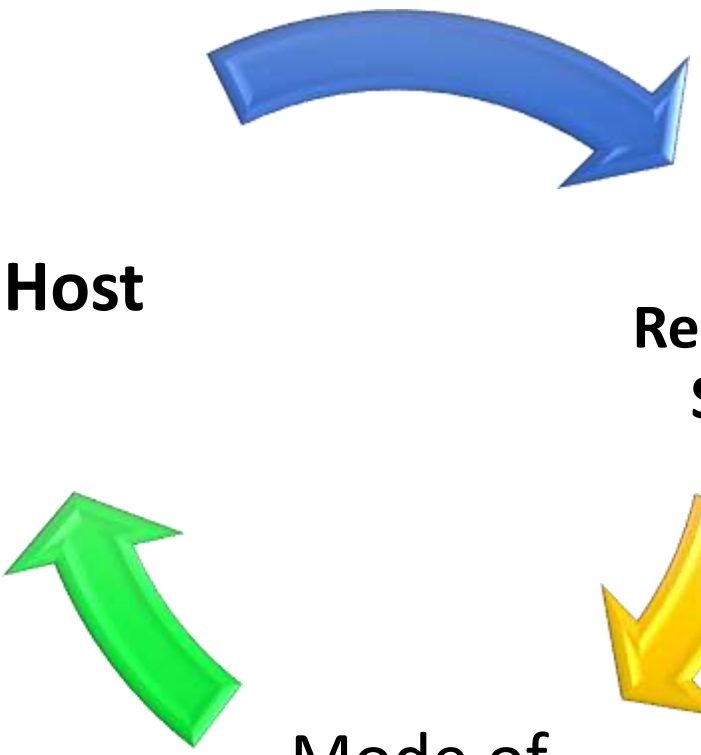
# *Control & Elimination of disease*

CONTROL: Disease incidence is reduced to a minimal level, acceptable at the level of country/region, at which the disease is no longer considered a public health problem, while infection may still occur.

ELIMINATION: Reduction to zero of the incidence of a specified disease in a defined community or country or region as a result public health actions.

# Cycle of infection and interventions applied at each link

*-Surveillance/quarantine*
*-Chemoprophylaxis*
*-Sero-prophylaxis*
*-Vaccination*




*-Isolation of cases*
*-Treatment*
*-Disinfection*
*-Control of carriers*
*-Control of animals*

*-Prevention of overcrowding*
*-Personal hygiene*
*-Vector control*
*-Environmental sanitation*

# Measures towards Reservoir

Objective of control measures towards reservoir

- Reduce quantity of agent (complete or partial reduction)
- Reduce communicability

Measures towards cases

Measures towards carriers

Measures towards animal reservoir

# Measures towards cases

- Case finding (early detection/screening)
- Reporting
- Segregation /isolation of cases
- Treatment of cases
- Disinfection

# Measures towards cases

**Segregation/Isolation of cases**

This means that the patient is isolated from the community in a fashion that prevents direct or indirect spread of infectious agents.

- Isolation is usually done for a period which equals the "period of communicability" at a hospital (fever hospital) or at home. Ideally repeated negative sample are needed before his release.

# Measures towards cases

**Treatment of cases**

- Early diagnosis and prompt treatment of infections with appropriate regimens (e.g. antibiotics, antiviral or other chemotherapeutic agents) helps reducing communicability.

# Measures towards cases

**Disinfection**

-Concurrent

-Terminal

Disinfection of the soiled articles by the patient discharges or excreta concurrently (during his presence as source of infection) and/or terminally (after his discharge from the hospital or death) helps in reduction of communicability.

Disinfection of contaminated objects with appropriate “enteric precautions,” “respiratory precautions,” “universal precautions”

# Measures applied to carriers

1. Detection of carriers:
   - If they represent important reservoir of infection.
   - If they were suspected in a closed community, such as boarding schools, army barracks, food handling places,…..
2. Exclusion from work: in certain occupations for example;
   - food handler (e.g. Typhoid carrier) or a
   - teacher (e.g. Diphtheria carrier).
3. Treatment for the carrier state (when applicable).

## *Measures applied to animal reservoir*

- Inspection and slaughtering of infected animals (in bovine tuberculosis)
- Testing and immunization of uninfected sheep, cattle (in brucellosis)
- Careful husbandry and sterilization of animal products (in anthrax).
- Extinction/Destruction of animal reservoir has been successful with diseases as **rabies** and bovine TB in several countries. Such procedure is only possible for domestic animals while it is difficult or almost impossible for wild animals (e.g. in jungle yellow fever,….)

# Measures to Contacts/ susceptible Host

- Surveillance/observation
- Quarantine
- Increasing resistance of susceptibles

# Measures to Contacts/ susceptible Host

- **Surveillance** means close medical supervision of the contacts, without restricting their movement, for the purpose of early detection of the disease in question.
- Surveillance should be done for duration of the longest “incubation period” of the disease counted from date of last exposure.

# *Choice of appropriate prevention & control measures*

*The choice of the control measure is disease dependent.*

*It depends upon the knowledge of:*

- *Natural history, causation and dynamics of disease transmission*
- *identification of risk factors and high risk groups*
- *availability of tools of intervention (vaccine chemoprophylaxis or treatment,..)*

# Measures towards the environment

- *Vector control (insecticides, indoor or aerial spraying, mosquito-nets,…..*
- *National and international measures: which include different public health measures undertaken within and between countries in order to protect the individuals and communities from communicable diseases.*

# Measures towards the environment

- *Reduction of overcrowding (better housing conditions, proper ventilation)*
- *Personal hygiene (cleanliness, hand washing, regular bathing)*
- *Environmental sanitation: (e.g. sanitary sewage disposal, sanitary refuse disposal, safe water supply,…)*

# *Eradication*

*It means worldwide disappearance of a disease i.e. (permanent reduction to zero level) :*

- *The organism may be present only in laboratories, but there is no need for public health actions. e.g. smallpox since 1979.*

# Level of Prevention

1. Primordial Prevention
2. Primary Prevention
3. Secondary Prevention
4. Tertiary Prevention

# Primordial Prevention

- Primordial prevention, a new concept, is receiving special attention in the prevention of chronic disease. This is primary prevention in its purest sense, that is, prevention of the emergence or development of risk factors in countries or population groups in which they have not yet appeared. In primordial prevention, efforts are directed towards discouraging children from adopting harmful lifestyles. The main intervention in primordial prevention is through individual and mass education.

# Primary Prevention

- Primary prevention can be defined as “action taken prior to the onset of disease will ever occur”. Primary prevention is far more than averting the occurrence of a disease and prolonging life. It includes the concept of “positive health”, a concept that encourages achievement and maintenance of “an acceptable level of health that will enable every individual to lead a socially and economically productive Life”. It concerns an individual’s attitude towards life and health and the initiative ha takes about positive and responsible measures for himself, his family and his community.

# Secondary Prevention

- Secondary prevention can be defined as “action which halts the progress of a disease at its incipient stage and prevents complications”. The specific interventions are early diagnosis (e.g., screening tests, case finding programmes) and adequate treatment. Secondary prevention is largely the domain of clinical medicine. The health programmes initiated by Governments are usually at the level of secondary prevention. The secondary prevention is an imperfect tool in the control of transmission of disease.

# Tertiary Prevention

- When the disease process has advanced beyond its early stages, it is still possible to accomplish prevention by what might be called “tertiary prevention”. Tertiary prevention can be defined as “all measures available to reduce or limit impairments and disabilities, minimize suffering caused by existing departures from good health and to promote the patients adjustment to irremediable conditions”.

# Cocept of Control

- The term “disease control” describes operations aimed at reducing the:
- a) incidence of disease
- b) the duration and the risk of transmission of disease
- c) effects of infection
- d) financial burden to the community

- e.g # malaria control, TB control etc

# Control of communicable Diseases

- Control measures:
- A. Measures taken at individual / personal level.
- B. Measures taken at community level.

# Control of communicable Diseases

- Personal level measures:
- 1) Attention to cases
- 2) Attention to contacts
- 3) Attention to carriers

# Control of communicable Diseases

- B. Measures taken at community level:
- 1) Vaccination/ Immunization
- 2) Mass chemotherapy
- 3) environmental control
- 4) Surveillance
- 5) Personal hygiene
- 6) Personal protection
- 7) Health education