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**Kingdom of Saudi Arabia**  
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# Introduction to Epidemiology

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**Week 9:**

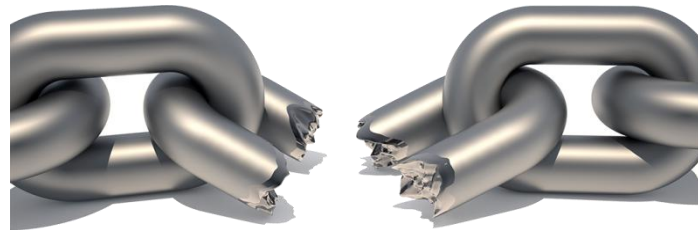
**Control & prevention**

# Objectives:

1. To describe the importance of epidemiology in disease prevention and control.
2. To gain know different communicable disease control measures.

**Control**

Every disease has certain weak points susceptible to attack. The basic approach in controlling disease is to identify these weak points and break the weakest links in the chain of transmission



## **Control of disease:**

Disease control involves all the measures designed to prevent or reduce as much as possible the incidence, prevalence and consequences of disease.

## **Broadly these measures aimed at controlling:**

1. The reservoir or source of infection
2. The route(s) of transmission
3. The susceptible host (people at risk).



## **1. Controlling the reservoir**

If the first link in the chain of causation (i.e.. the disease agent) is deemed to be the weakest link, logically, the most desirable control measure would be to eliminate the reservoir or source, if that could be possible.

Elimination of the reservoir may be pretty easy with the animal reservoir but is not possible in humans.

*Elimination* **IMPOSSIBLE**

*Diagnosis*

*Notification*

*Isolation*

*Treatment*

*Disinfection*



*Elimination*

*Diagnosis*



*Treatment*

## **Early diagnosis:**

The first step in the control of a communicable disease is its rapid identification.

Early diagnosis is needed for the treatment of patients and for epidemiological investigations.

## **Notification:**

Once an infectious disease has been detected (or even suspected), it should be notified to the local health authority.

The diseases to be notified vary from country to country. Usually, diseases which are considered to be serious menaces to public health are included in the list of notifiable diseases.

## **Isolation:**

Isolation is the oldest communicable disease control measure. It is defined as "separation, for the period of communicability of infected persons or animals from others in certain places and under certain conditions.

## Quarantine:

Quarantine has been defined as "the limitation of freedom of movement of such well persons or domestic animals exposed to communicable disease for a period of time not longer than the longest usual incubation period of the disease.

## Isolation vs. quarantine

	<b>Quarantine</b>	<b>Isolation</b>
Person or animal	suspected	infected
Period	Incubation period	Communicability period

## Treatment:

The object of treatment is to kill the infectious agent when it is still in the reservoir. i.e.. before it is disseminated. Treatment reduces the communicability of disease, cuts short the duration of illness and prevents development of secondary cases.

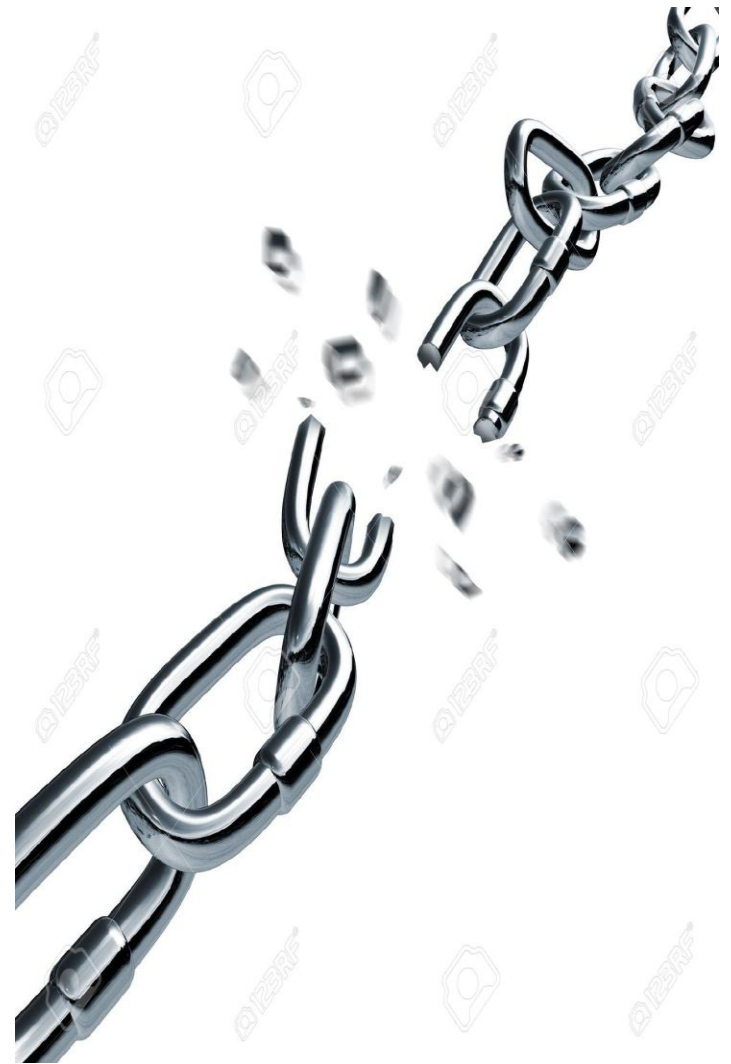




***Mass treatment:*** all the people in the community are administered the drugs whether they have the disease or not.

## 2. Interrupting transmission

A major aspect of communicable disease control relates to "breaking the chain of transmission" or interruption of transmission.



**Measures of interrupting transmission such as**  
environmental modification, water treatment, food  
safety, vector control.

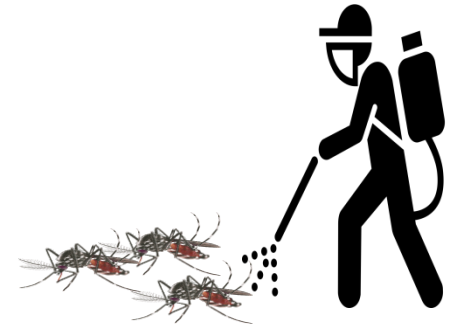
*Water Treatment*



*Food safety*



*Vector control*



### 3. The susceptible host

The third link in the chain of transmission is the susceptible host or people at risk. They may be protected by one or more of the following strategies.

*Immunization*



*Proper nutrition*



*Personal hygiene*



*Health education*



**prevention**

The prevention of disease or health related event has four levels. These are:

1- Primordial prevention

2- Primary prevention

3- Secondary prevention

4- Tertiary prevention

## **1- Primordial prevention**

It is the prevention of emergence of risk factors in populations, in which they have not yet appeared

## **2- Primary prevention**

Any action taken prior to the onset of disease, which removes the possibility that a disease will ever occur.



# Interventions of primary prevention:

- 1) Environmental modification
- 2) Health education
- 3) Nutrition
- 4) Vaccination
- 5) Life style change
- 6) others

### **3- Secondary prevention**

The action which halts the progress of a disease at its incipient stage and prevents complications.

## **Interventions of secondary prevention:**

1) Diagnosis

2) Treatment

## **4- Tertiary prevention**

All measures available to reduce or limit impairments and disabilities.

## **Interventions of tertiary prevention:**

- 1) Disability limitation
- 2) Rehabilitation

# Rehabilitation

- 1) Medical rehabilitation
- 2) Vocational rehabilitation
- 3) Social rehabilitation
- 4) Psychological rehabilitation

# Levels of Prevention

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<b>Stage of disease</b>	<b>Level of prevention</b>	<b>Type of response</b>
<b>Pre-disease</b>	<b>Primary Prevention</b>	<b>Health promotion and Specific protection</b>
<b>Latent Disease</b>	<b>Secondary prevention</b>	<b>Pre-symptomatic Diagnosis and treatment</b>
<b>Symptomatic Disease</b>	<b>Tertiary prevention</b>	<ul style="list-style-type: none"><li>•Disability limitation for early symptomatic disease</li><li>•Rehabilitation for late Symptomatic disease</li></ul>

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# Strategies of prevention

**Before the onset of disease the prevention should focus on:**

**1- Encouraging healthy behavior**

**2- Increasing host resistance**

**3- Controlling environmental hazards**



# 1. Encouraging healthy behavior regarding to

- nutritional habits,
- personal hygiene,
- physical activity,
- smoking,
- alcohol and drug use,
- utilization of health services

## 2. Increasing host resistance through

- immunization,
- chemoprophylaxis,
- nutrition
- breast feeding

### **3. Controlling environmental hazards:**

- Improvement of water supply
- Waste disposal
- Air quality
- Housing quality
- Food hygiene
- Occupational safety

**After the onset of disease the prevention should focus on:**

- Early case detection
- Effective management
- Medical rehabilitation
- Psychosocial rehabilitation
- Vocation rehabilitation