

Diseases - Causes and Control

- **Health and Disease**

- **Health** - A state of physical, mental, and social well-being that includes a unity and harmony within the mind, body, and soul of an organism
- **Disease** - Any condition that can lead to discomfort, distress, health problems, and even death of the affected person
- **Symptoms** - Indications of disease, such as headache, stomach pain, nausea, etc that can only be felt by the patient
- **Signs** of a disease include fever, vomiting, diarrhoea, etc that can be observed by a physician
- **Incubation period** - The time interval between infection and appearance of symptoms

Causes of diseases

1. Contributory causes

- Unhealthy condition
- Improper public service
- Poverty

2. Immediate causes:

- These are external causes like micro-organisms.
- Organisms like virus, bacteria, and other micro-organisms can cause diseases in a person.

On the basis of its duration , diseases are of two types- Acute and Chronic

- **Acute** - Lasts for a short period of time, eg. Cold, cough, influenza, etc.
- **Chronic** - Lasts for long periods of time, eg. Diabetes, kidney stones, etc.

The disease-causing microorganisms that transmit communicable diseases belong to different categories such as:

- **Viruses** - These are tiny organisms that grow, multiply, or reproduce only inside the host cells.

Diseases caused by viruses - Influenza, cold (Rhinovirus), dengue, AIDS, etc.

- **Bacteria** - These are unicellular organisms; larger than viruses

Diseases caused by bacteria - Whooping cough, typhoid, cholera, anthrax, etc.

- **Fungi** - These are plant-like organisms; heterotrophic

Diseases caused by Fungi - Athlete's foot, candidiasis, ringworms, etc.

- **Protozoa** - These are simple, primitive unicellular organisms which are often found in water.

Diseases caused by Protozoa - Amoebiasis, kala azar, malaria, African sleeping sickness, etc.

- **Multicellular animals like worms** - These are parasites that infect the intestines of human beings and other animals.

Diseases caused by worms- Diarrhoea, anaemia, liver rot, etc.

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- **Disease** is characterised by various signs and symptoms.

- Infectious diseases. For example: Common cold

- Noninfectious For example: Cancer

- **Infectious diseases.**

It spreads through infectious agents that include bacteria, viruses, protozoans and fungi.

- **Bacterial diseases**

1. Typhoid fever: *Salmonella typhi*; Widal test is used for confirmation of typhoid
2. Pneumonia: *Streptococcus pneumoniae* and *Haemophilus influenzae*; it infects the alveoli of lungs
3. Other examples include dysentery, plague, diphtheria

- **Viral diseases**

1. Common cold: Spreads through Rhino viruses

- **Protozoan diseases**

1. Malaria: Pathogen is *Plasmodium*; malarial parasite requires two hosts: humans and female anopheles mosquito; malarial parasite reproduces asexually in the human host while in the mosquito host it reproduces sexually
2. Amoebiasis (amoebic dysentery): *Entamoeba histolytica*

- **Helminthes diseases**

1. Ascariasis: Pathogen is *Ascaris*
2. Elephantiasis or filariasis: Pathogen is *Wuchereria bancrofti*
3. Taeniasis : pathogen is *Taenia solium* or *Taenia saginata*

- **Fungi**

1. Ringworms: Caused by fungi which belong to genera *Microsporum*, *Trichophyton* and *Epidermophyton*

- **Infectious agents**

- They are the disease-causing microorganisms which belong to different categories such as:

- **Viruses** - These are tiny organisms that grow, multiply, or reproduce only inside the host cells. Some diseases caused by viruses - Influenza, cold (Rhinovirus), dengue, AIDS, SARS etc.
 - **Bacteria** - These are unicellular prokaryotes which are harmful as well as beneficial for humans. Some diseases caused by bacteria - Whooping cough, typhoid, cholera, anthrax, etc.
 - **Fungi** - These are eukaryotic heterotrophic organisms. Some diseases caused by Fungi - Athlete's foot, candidiasis, ringworms, etc.
 - **Protozoa** - These are simple, primitive unicellular organisms which are often found in water. Some diseases caused by Protozoans - Amoebiasis, kala azar.
 - **Multicellular animals like worms** - These are parasites that infect the intestine of human beings and other animals. Some diseases caused by worms - Diarrhoea, liver rot, etc.
- **Communicable diseases**
 - An infectious disease is classified as communicable disease as it can be transferred from an infected person to a healthy person
- **Means of disease spread**
 - They are the disease-causing microorganisms which belong to different categories such as:
 - **Air-borne diseases** - Transmitted when disease-causing microorganisms are expelled into the air by coughing, sneezing, talking, etc. **E.g.**, common cold, chicken pox, small pox, pneumonia, influenza, tuberculosis, etc.
 - **Water-borne diseases** - Spreads when the excretions (from an infected person) containing causal microorganisms get mixed with drinking water and this contaminated water is consumed. **E.g.**, cholera, typhoid, hepatitis A, etc.
 - **Physical contact** – Includes sexually-transmitted diseases. **E.g.**, syphilis, gonorrhoea, AIDS, etc.
 - **Blood to blood contact** – Such contact is established during blood transfusion or pregnancy (between the mother and her baby). **E.g.**, AIDS can spread through blood contact
 - **Animals** – Animals that transfer disease-causing microorganisms from an infected person to others are called vectors. **E.g.**, female mosquitoes can transfer the malaria-causing Plasmodium
- **Effects of diseases**
 - **Local effects** - Includes swelling, pain, joint stiffness, etc., that occur only at the site of infection

- **General effects** - Includes fever chills, headaches, fatigue, loss of appetite, etc., that occur all over the body
- **Inflammation**- The process by which the body's immune system shows response to protect the body from infection

Based on the mode of transmission, communicable diseases are of following types

- **Air-borne diseases** - Transmitted when disease-causing microorganisms are expelled into the air by coughing, sneezing, talking, etc.

Eg. Common cold, chicken pox, small pox, pneumonia, influenza, tuberculosis, etc.

- **Water-borne diseases** - Spread when the excretions, from an infected person, containing causal microorganisms get mixed with drinking water and this contaminated water is consumed

E.g., Cholera, typhoid, hepatitis A, etc.

- **Food borne diseases** – Caused by consuming food infected by disease causing microbes.

E.g. Botulism, stomach infections, etc.

- **Contact** – spreads through coming in contact with the diseased person or using the articles used by him

Eg. swine flu, ringworm, conjunctivitis

- **Animals** – Animals which transfer disease-causing microorganisms from an infected person to others are called vectors

Eg. female mosquitoes can transfer the malaria-causing Plasmodium.

- **Health:** A complete state of well being, which not just includes a fit, disease-free body, but also includes a person's ability to realize his or her full potentials.
- **Disease** refers to any disorder of structure or structural function in an organism.

- Acute diseases are those that last only for a short period of time. Examples include cold and cough.
- Chronic diseases are those that last for a long period. Examples include diabetes, blood pressure, etc.
- On the basis of communicability, diseases can be communicable or infectious and non-communicable, or non-infectious.
- Communicable or infectious diseases are caused by some germs or **pathogens**. They can get transferred from one person to the other, a process called **infection**. Common examples are cholera, malaria, small pox, etc.
- Non-communicable or non-infectious diseases are not caused by any germ and cannot spread from one patient to the other. They can occur due to some nutritional deficiency (like scurvy), or due to some metabolic disorder (diabetes), or due to any allergy or genetic disorder (haemophilia), etc.

- **Viruses**

- Viruses are extremely small infectious agents, made up of nucleic acids and proteins.
- They cannot live freely in nature and require a host cell to live.
- They can be cultured on living tissue in the laboratory. They can also be crystallised and stored.
- Most of the viruses are highly specific for their hosts.

- **Viral diseases**

1. **Common cold:** Spreads through Rhino viruses
2. **Poliomyelitis (polio):** Spreads through polio virus
3. **Measles:** Spreads through Paramyxo virus

1. Other disease include: **AIDS, Mumps, Rabies** etc.

- **Protozoan diseases**

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2. **Amoebiasis** (amoebic dysentery): *Entamoeba histolytica*

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