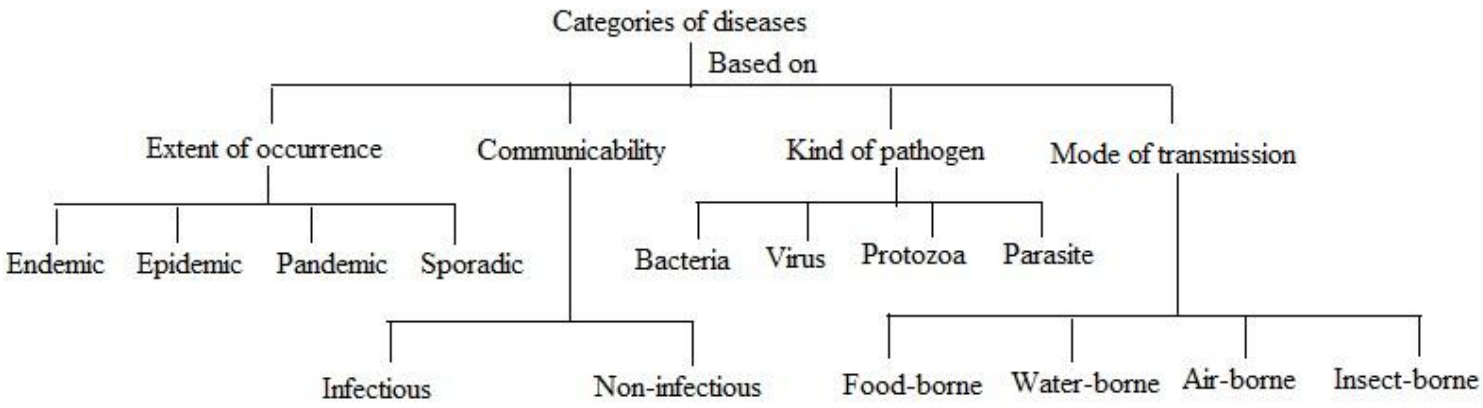
Diseases: Cause and Control

- **Health** is the state of complete physical, mental and social well-being.
- A condition of the body in which the vital functions are disturbed physiologically or psychologically is called a **disease**.
- **Categories of Diseases**



- When the occurrence of the disease is restricted to a particular area and affects a small number of people, it is known as an **endemic disease**. Examples: Yellow fever, goitre
- When the disease spreads from place to place, followed by its outbreak and attacks a large population at the same time, it is known as an **epidemic disease**. Example: Plague
- When the occurrence of the disease is worldwide, it is known as a **pandemic disease**. Example: AIDS
- The disease occurring in single, scattered cases is known as a **sporadic disease**. Examples: Malaria, cholera
- Diseases caused by infectious agents or pathogens are called **communicable** or **infectious diseases**. Examples: Tuberculosis, chickenpox, measles
- Diseases which do not spread from one person to another are called **non-communicable** or **non-infectious** diseases. Examples: Beriberi, scurvy, arthritis
- Diseases caused by bacteria are called **bacterial diseases**. Examples: Cholera, tetanus, syphilis
- Diseases caused by viruses are called **viral diseases**. Examples: Poliomyelitis, mumps, rabies
- Diseases caused by protozoa are called **protozoal diseases**. Examples: Malaria, amoebic dysentery
- Diseases caused by parasitic worms are called **parasitic diseases**. Examples: Ascariasis, taeniasis

- Diseases caused by consumption of food contaminated with chemical toxins or pathogens are called **food-borne diseases**. Examples: Taeniasis, trichinosis

- Diseases caused by consumption of contaminated water are called **water-borne diseases**. Examples: Typhoid fever, cholera, hepatitis A

- Diseases which spread through air when droplets of pathogens are expelled into the air due to coughing, sneezing or talking are called **air-borne diseases**. Examples: Influenza, meningitis

- Diseases caused by pathogens transmitted by insects and ticks are called **insect-borne diseases**. Examples: Malaria, elephantiasis

- **Diseases Caused by Bacteria**

DISEASE	INCUBATION PERIOD	MODE OF TRANSMISSION	SYMPTOMS	PREVENTIVE MEASURES
Tuberculosis (*Mycobacterium tuberculosis*)	2–10 weeks	Air, dust or the sputum of an infected person	1. Wasting of the body occurs, resulting in loss of resistance and weakness 2. Loss of appetite and weight	1. The patient should be kept in isolation 2. BCG (Bacillus Calmette Guerin) vaccine should be administered
Cholera (*Vibrio cholerae*)	Few hours to 6 days	Contaminated water, food and drinks; spread by flies	Severe stomach ache, diarrhoea with white, watery and foul smelling faecal waste and vomiting	1. Control of houseflies 2. Personal hygiene, cleanliness of the surroundings and consumption of well-cooked, nutritious food 3. Anti-cholera injection
Tetanus (*Clostridium tetani*)	4–20 days	Cuts or wounds in the skin; enters through the blood into the spinal cord	1. Painful contractions or spasms of muscles of neck and jaw 2. Body becomes rigid and may even bend like a bow	1. Wounds and cuts should be cleaned immediately 2. Anti-tetanus vaccine should be given
Syphilis (*Treponema pallidum*)	1–12 weeks	Sexually transmitted or close contact	1. Skin rash; ulcers on the penis, rectum, lips, tongue and nipples 2. Fever	1. Avoid sexual contact with an infected person 2. Treatment of antibiotics, especially that of penicillin

DISEASE	INCUBATION PERIOD	MODE OF TRANSMISSION	SYMPTOMS	PREVENTIVE MEASURES
Diphtheria (*Corynebacterium diphtheriae*)	2–10 days	Droplet infection while coughing and sneezing, contact	Patient experiences pain in the throat, fever and difficulty in breathing	1. DPT vaccine 2. Isolation of the patient
Typhoid (*Salmonella typhi*)	7–21 days	Contaminated water, milk, through flies	1. Fever is usually high, especially in the afternoon, accompanied by cold 2. Diarrhoea, nausea, vomiting, loss of appetite and constipation 3. Rose-coloured rashes or eruptions appear on the chest and abdomen	1. Personal hygiene and cleanliness of the surroundings 2. Typhoid vaccine should be given
Whooping cough *(Haemophilus pertussis*)	10–15 days	Contact, droplet infection of the throat	1. Fever, cold with running nose and irritating cough 2. Whoop is developed at the end of cough as a sudden bout of noisy breath 3. Vomiting after injection of food	DPT vaccine or triple antigen is commonly given
Pneumonia (*Diplococcus pneumoniae*)	1–3 days	Contact or by air	1. Difficulty in breathing 2. Water accumulates in the lungs	Avoid fatigue, malnutrition and contact
Leprosy (*Mycobacterium leprae*)	Several years	Contact, highly contagious	Nervous loss of sensation, paralysis and deformity	1. Vaccination 2. Good nutrition and sanitation
Gonorrhoea (*Neisseria gonorrhoea*)	3–10 days	Sexual contact	1. Pain during urination 2. Pus-like discharge in genital tubes	Avoid sexual contact with an infected person

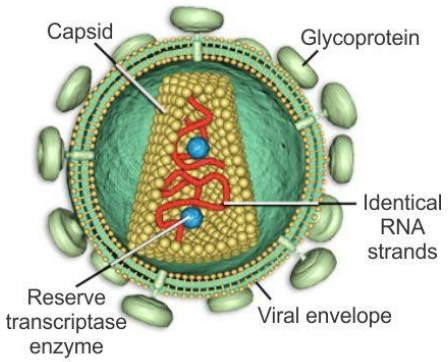
- **Diseases Caused by Protozoa**

DISEASE	INCUBATION PERIOD	MODE OF TRANSMISSION	SYMPTOMS	PREVENTIVE MEASURES
Malaria (*Plasmodium falciparum*)	About 3 weeks	Female Anopheles mosquito acts as a carrier	1. Cold stage characterised by sudden onset of fever 2. During the hot stage, the body temperature may rise to 41°C or 106°F 3. Sweating stage characterised by profuse sweating and lowering of body temperature	1. Population of mosquitoes should be reduced or eliminated 2. Mosquito bites should be prevented by using mosquito nets, applying mosquito repellents to the body 3. Water boiled with leaves and inflorescence of neem should be used for drinking
Amoebic dysentery or Amoebiasis (*Entamoeba histolytica*)	About 1 week	Food and water contaminated by flies, faeces of an infected person	1. Diarrhoea or watery motions, containing mucus or blood and pain in the abdomen 2. Intestinal lining is destructed completely 3. Constipation alternating with diarrhoea 4. Stomach convulsions	1. Food should be kept covered properly to avoid contamination by flies and dust carrying cysts 2. Avoid eating spicy and fried food 3. Population of flies should be controlled or eliminated 4. Clean, boiled and cooled water should be used for drinking
Sleeping sickness (*Trypanosoma brucei gambiense* and *Trypanosoma brucei rhodesiense*)	From 3 days to 3 weeks	Bite of Tsetse fly	1. Swollen, red, painful nodule at the site of the fly bite 2. Fever, headache, itchiness and joint pain in the first phase 3. Mood changes and anxiety 4. Insomnia at night	1. Insect control measures can help prevent the spread of sleeping sickness 2. Administration of drugs such as melarsoprol, pentamidine, suramin

- **Diseases Caused by Parasitic Worms**

DISEASE	INCUBATION PERIOD	MODE OF TRANSMISSION	SYMPTOMS	PREVENTIVE MEASURES
Ascariasis (*Ascaris lumbricoides*)	About 4–8 weeks	Soil, food and water contaminated with eggs of female worm; flies act as carriers	1. Bleeding in liver, heart, lungs 2. Sudden contraction of muscles, fever and anaemia	1. Maintenance of personal hygiene 2. Boiled, cooled and fresh water should be used for drinking
Taeniasis (*Taenia solium*)	About 8–14 weeks	Consumption of infected pork and beef	Extreme weakness	1. Avoid raw meat 2. Cook meat at a temperature greater than 140°F for about 5 minutes 3. Freeze meat
Filariasis/Elephantiasis (Filarial worm *Wuchereria bancrofti*)	4 weeks to 1 year	Bite of the *Culex* mosquito	1. Characteristic swelling in the arms, legs and chest 2. Swollen legs resembling those of an elephant 3. Inflammation of lymph glands and lymph vessels 4. Enlargement of limbs/ankle 5. Fever with chills	1. Avoid mosquito bites 2. Eradication of the vector 3. Use of antibiotics and anti-inflammatory analgesics

- **Viruses** are small substances made of nucleic acids and proteins.



Structure of virus

- Viruses cannot live freely in nature. They can exist only inside other cells.
- They can take over the metabolism of the host cell, produce more viruses and ultimately kill the host cell.

- **Differences between Viruses and Bacteria**

VIRUSES	BACTERIA
• Very small	• Larger
• Visible only under an electron microscope	• Visible under a light microscope
• Non-cellular	• Single-celled
• Have no metabolism	• Have metabolism
• Do not take in any food	• Take in food by absorption
• Do not grow and divide	• Grow and divide to produce more bacteria
• Can be crystallised	• Cannot be crystallised
• Command the host cell to produce virus	• Self-reproducing
• All produce diseases in man, animals or plants	• Some harmless, some useful and some disease-producing

- **Common Viral Diseases**

DISEASE	INCUBATION PERIOD	MODE OF TRANSMISSION	SYMPTOMS	PREVENTIVE MEASURES
Poliomyelitis (Polio virus)	7–14 days	Excreta or secretion of the nose; incubates in the intestine, passes to the brain through the blood vessels	1. Muscle paralysis of legs 2. Common cold, sore throat, fever, fatigue, headache, vomiting and reddening of the throat	Vaccination, polio vaccine
Mumps (*Myxovirus parotitis*)	12–26 days	Contact, contaminated food or milk and air	1. Characteristic painful swelling of salivary glands 2. Pain while opening the mouth, earache, headache and fever	1. Avoid sexual contact 2. Vaccination of gamma globulin 3. Complete isolation
Rabies (Rhabdovirus)	30 days or more	Mad dog bite (canine disease)	1. Hydrophobia 2. Attacks the central nervous system	Immunisation of the dog

DISEASE	INCUBATION PERIOD	MODE OF TRANSMISSION	SYMPTOMS	PREVENTIVE MEASURES
AIDS (HIV)	15 months–10/12 years	Infected blood, shared injection needles, sexual contact	1. Deficiency of the immune system 2. Loss of weight	1. Avoid sexual contact with HIV-infected people 2. Avoid using syringes and needles used by AIDS patients 3. Blood should be tested properly for HIV before blood donation 4. Breastfeeding should be avoided by HIV-infected mother 5. Addiction to narcotic drugs should be avoided
Chicken pox (Herpes virus *Varicella zoster*)	About 14–16 days	Close contact with an infected person	1. Highly irritating rashes or small boils on the skin 2. Rashes appear as pink spots and may subsequently change into watery pustules/blisters 3. Blisters shrivel and soon dry up forming scabs after 3–4 days	1. Complete bed rest 2. Rashes must be kept clean and dry 3. Blisters should not be pricked 4. Calamine lotion or neem leaves can be applied to reduce itching 5. Active immunisation by administering live attenuated vaccine containing *Varicella*

DISEASE	INCUBATION PERIOD	MODE OF TRANSMISSION	SYMPTOMS	PREVENTIVE MEASURES
Hepatitis (Hepatitis A virus)	About 14–45 days	Contaminated food and water	1. Yellowing of the skin and eyes 2. Abdominal pain 3. Loss of appetite 4. Nausea and vomiting 5. Diarrhoea 6. Fever	1. Maintaining good hygienic conditions to prevent contamination of food and water 2. Washing hands after handling patient's bed and clothes 3. Intake of high calorific diet with limited or no protein and fat
Hepatitis (Hepatitis B virus)	About 6−26 weeks	Exposure to infected blood by contaminated syringes and transfusion equipment	1. Yellowing of the skin and eyes 2. Abdominal pain 3. Loss of appetite 4. Nausea and vomiting 5. Diarrhoea 6. Fever 7. Cirrhosis of the liver and cancer in extreme cases	1. Use of disposable needles and syringes 2. Multiple and unsafe sexual contact should be avoided
Hepatitis (Hepatitis C virus)	About 2 weeks to 6 months	Exposure to infected blood by contaminated syringes and transfusion equipment	1. High temperature 2. Headache 3. Joint pain 4. Loss of appetite 5. Nausea and vomiting 6. Deep yellow urine and light-coloured stools	1. Use of disposable needles and syringes 2. In case of infection, complete bed rest until fever has settled 3. Intake of high calorific diet with limited or no protein and fat

DISEASE	INCUBATION PERIOD	MODE OF TRANSMISSION	SYMPTOMS	PREVENTIVE MEASURES
Hepatitis (Hepatitis D virus)	About 2−6 months	Exposure to infected blood by contaminated syringes and transfusion equipment	1. High temperature 2. Headache 3. Joint pain 4. Loss of appetite 5. Nausea and vomiting 6. Deep yellow urine and light-coloured stools	1. Use of disposable needles and syringes 2. Washing hands after handling patient's bed and clothes 3. Complete bed rest until fever has settled 4. Intake of high calorific diet with limited or no protein and fat
Hepatitis (Hepatitis E virus)	About 21−42 days	Contaminated food and water	1. Feeling of tiredness 2. Sudden loss of weight 3. Nausea and loss of appetite 4. Yellowing of skin, dark urine and clay-coloured stools	1. Drink plenty of water to avoid dehydration 2. Eat a healthy mix of foods 3. Avoid alcohol consumption or use of illegal/ narcotic drugs