

CHAPTER – 13

WHY DO WE FALL ILL

HEALTH AND ITS FAILURE

Good health is a very hard thing to measure, but it is one of life's most precious things. The World Health Organisation has defined health as a state of complete physical, mental and social well-being.

Community health can be defined as "All the personal health along with the environmental services for the importance of health of community".

Some of the health services are given below:

Establishment of health care services like primary health centers, district hospitals, community health centers, medical colleges, all Indian institutes, regional hospitals etc.

Provision of safe drinking water and proper disposal of garbage.

Prevention of harmful insect breeding sites.

Management of different types of environmental pollution by Central and State Pollution Control Boards.

Preventive vaccinations against number of diseases like tuberculosis, diphtheria, whooping cough, tetanus, measles, hepatitis, etc.

Provision of family planning advices and services.

Provision of medical care to school going children.

Prevention of food adulteration.

Health education.

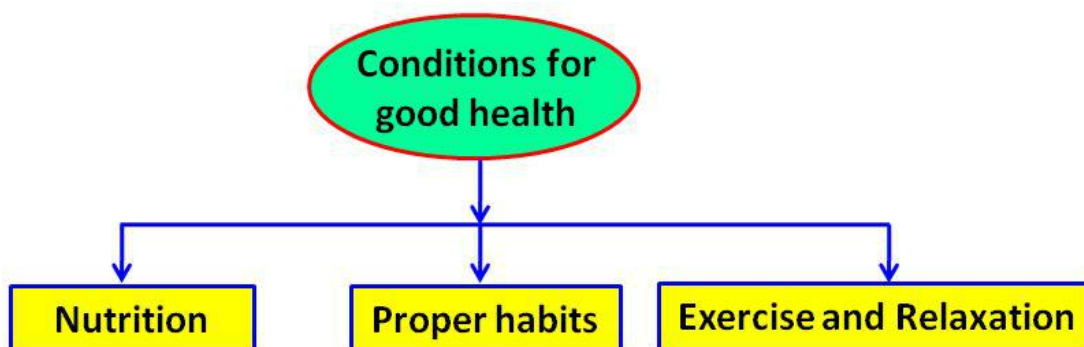
CONDITIONS ESSENTIAL FOR GOOD HEALTH

There are several conditions which have to be fulfilled for good health. The important ones are

Nutrition,

Proper habits, and

Exercise and relaxation.



(i) Nutrition

Nutrition can be defined as the procurement of substances necessary for growth, development, maintenance and activities of a living organism.

We obtain food from various plant and animal sources. In order to keep healthy and energetic, we need to take food. It takes care of the daily energy need also. We consume energy even while sleeping. Energy requirement depends on individual, age and special need. Growing children, pregnant women and nursing mothers need more energy.

(ii) Proper Habits

Another important aspect of good health is to observe proper dietary habits that are consumption of balanced diet and at fixed time. Good personal and domestic hygiene is very essential. Take full care of the following aspects.

- Your food should be fresh and kept away from dust, flies, insect and microbes to avoid any infection and spoilage.
- Utensils should be kept clean.
- You should wash your face and hands with soap before eating or handling the food.
- Food should be cooked with good feelings and cheerful state.
- Smoking, chewing tobacco, drinking alcohol, taking addictive drugs are bad habits and should be avoided.
- They can have damaging effects on our body and mind.

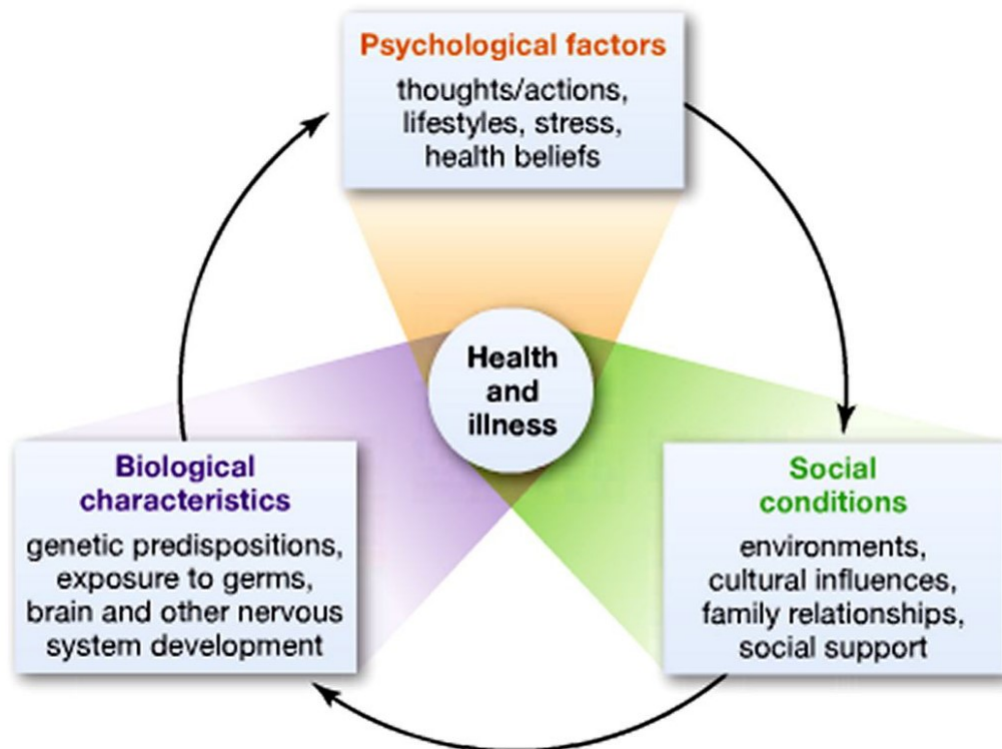
(iii) Exercise and Relaxation

Regular exercise is necessary to keep our body fit. These exercises vary with age, physical condition and nature of work of the individual. In the case of sedentary worker, exercise is even more essential. Another aspect of health is regular sleep and relaxation. The duration of sleep also varies with age and nature of work. Infants sleep for long hours, which is necessary for them to grow. For children, an average of eight hours of sound sleep is sufficient. For adults six hours of sleep is enough. Relaxation improves the capacity to work. Relaxation may be defined as an activity or recreation, which provides a relief or diversion from work or effort. There are various ways of relaxation. Yoga and meditation relax the body and mind. Listening to music and reading magazines are also relaxing.

PERSONAL AND COMMUNITY ISSUES BOTH MATTER FOR HEALTH

Health is a state of physical, mental and social well being. The conditions necessary for good health are :-

- Good physical and social environment.
- Good economic conditions.
- Social equality and harmony.



- Good physical and social environment includes clean surroundings, good sanitation, proper garbage disposal and clean drinking water.
- Good economic conditions includes job opportunities for all for earning to have nutritious food and to lead a healthy life.
- Social equality and harmony are necessary for a healthy and peaceful life.

DISTINCTIONS BETWEEN 'HEALTHY' AND 'DISEASE-FREE'

Healthy	Disease free
It is a state of physical, mental and social well being.	It is a state of absence from diseases.
It refers to the individual, physical and social environment.	It refers only to the individual.
The individual has good health.	The individual may have good health or poor health.

DISEASE AND ITS CAUSES

A person may be regarded as suffering from a disease when his body does not function properly. Minor and major disorders of the body may lead to diseases. Infectious diseases are caused by germs. One of the greatest achievements in the history of mankind is the demonstration by Pasteur, Koch and others of germs or microbes that cause diseases. Microbes are the microscopic organisms such as virus, bacteria, some fungi and protozoans that are responsible for causing diseases in human beings. Cholera, tetanus, typhoid, diphtheria and pneumonia are some common diseases caused by bacteria. Polio, common cold, influenza, measles, chicken pox and AIDS are diseases caused by virus. Amoebic dysentery and malaria are caused by protozoans.

Name of the disease	Medium
Tuberculosis, pneumonia, diphtheria, influenza, measles and common cold	Air
Cholera, typhoid, dysentery and diarrhoea	Food, water
Leprosy, ringworm and scabies	Skin contact
Malaria, filarial and plaque	Insects

ACUTE AND CHRONIC DISEASES

When a person is affected by a disease either the normal functioning or the appearance of one or more systems of the body changes for the worse. These changes give rise to signs of the disease called symptoms. On the basis of the symptoms the physicians look for the signs of a particular disease and conduct tests to confirm the disease.

Types of diseases :- Diseases are of different types. They are :- i) Acute diseases :- are diseases which last only for a short period of time and does not have long term effect on health. Eg:- cold, cough, typhoid, cholera etc. ii) Chronic disease :- are diseases which lasts for a long time and has long term drastic effect on health. Eg :- diabetes, tuberculosis, elephantiasis, arthritis, cancer etc.

Difference between Acute Disease and Chronic Disease

Acute Disease	Chronic Disease
They are short duration disease.	They are long lasting disease.
Patient recovers completely after the cure.	Patient does not recover completely.
There is no loss of weight or feeling of tiredness afterward.	There is often loss of weight or feeling of tiredness.
There is short duration loss of work and efficiency.	There is a prolonged loss of work and efficiency.

CHRONIC DISEASES AND POOR HEALTH

Chronic disease is a disease that persists for a long time. Chronic diseases are the major cause of death and disability worldwide.

The total number of people dying from chronic diseases is double that of all infectious diseases (including HIV/AIDS, tuberculosis and malaria), maternal and parental conditions, and nutritional deficiencies combined. 80% of chronic disease deaths occur in low and middle income countries and half are in women. Without action to address the causes, deaths from chronic disease will increase by 17% between 2005 and 2015.

Chronic diseases

- Cardiovascular diseases, mainly heart disease and
- Stroke;
- Cancer;
- others, such as mental disorders, vision and hearing impairment, oral diseases, bone and joint disorders,
- chronic respiratory diseases;
- diabetes;
- genetic disorders.

HEART DISEASE

There are many forms of heart disease. Coronary heart disease, also known as coronary artery disease or ischaemic heart disease, is the leading cause of death globally. It is caused by disease of the blood vessels (atherosclerosis) of the heart.

STROKE

Stroke is a disease of the brain caused by interference to the blood supply. Stroke and heart disease are the main cardiovascular diseases.

CANCER

Cancer describes a range of diseases in which abnormal cells proliferate and spread out of control. Other terms used are tumours and neoplasms. There are many types of cancer and all organs of the body can become cancerous.

CHRONIC RESPIRATORY DISEASES

Diseases of the lung take many forms. Chronic obstructive respiratory disease and asthma are the most common forms.

Chronic obstructive respiratory disease is caused by irreversible obstruction of the larger airways in the lung; asthma is caused by reversible obstruction of the smaller airways in the lung.

DIABETES

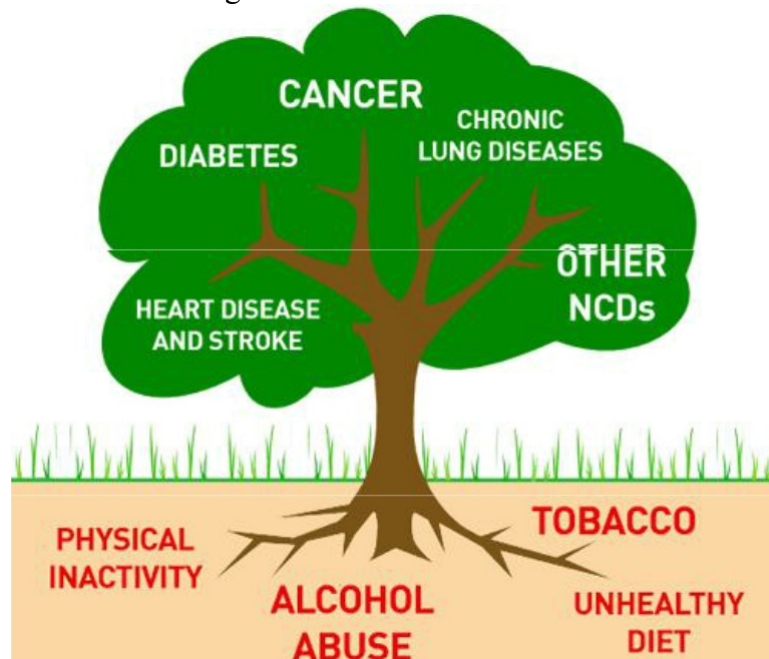
Diabetes is characterized by raised blood glucose (sugar) levels. This results from a lack of the hormone insulin, which controls blood glucose levels, and/or an inability of the body's tissues to respond properly to insulin. The most common type of diabetes is type 2, which accounts for about 90% of all diabetes and is largely the result of excessive weight and physical inactivity. The usual childhood form of diabetes (type 1 diabetes) is caused by an absolute lack of insulin. Without insulin, type 1 diabetes is rapidly fatal.

WHAT CAUSES CHRONIC DISEASES?

The causes (risk factors) of chronic diseases are well established and well known; a small set of common risk factors are responsible for most of the main chronic diseases. These risk factors are modifiable and the same in men and women:

- unhealthy diet;
 - physical inactivity;
 - tobacco use.
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These causes are expressed through the intermediate risk factors of raised blood pressure, raised glucose levels, abnormal blood lipids, overweight and obesity. The major modifiable risk factors, in conjunction with the non-modifiable risk factors of age and heredity, explain the majority of new events of heart disease, stroke, chronic respiratory diseases and some important cancers. The relationship between the major modifiable risk factors and the main chronic diseases is similar in all regions of the world.



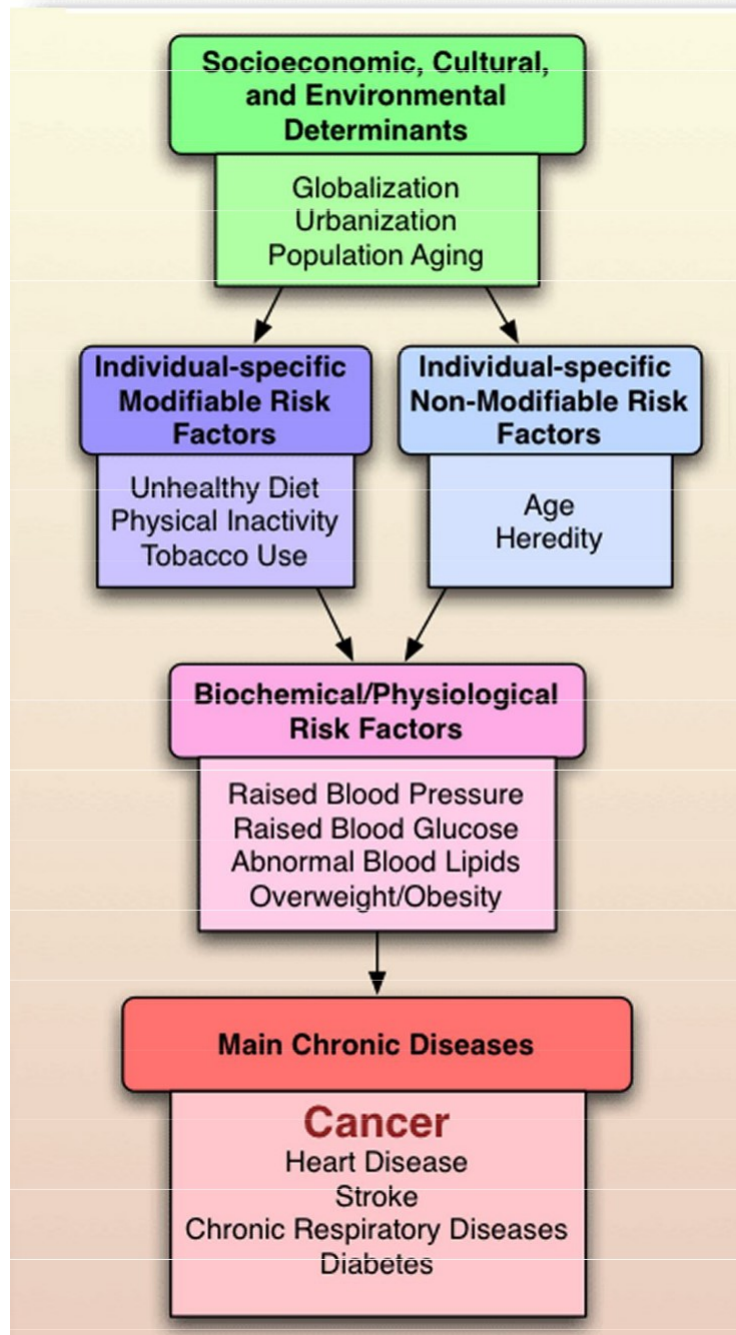
OTHER RISK FACTORS

Many more risk factors for chronic diseases have been identified, but they account for a smaller proportion of disease. Harmful alcohol use is an important contributor to the global burden of disease but its relationship to chronic disease is more complex. Other risk factors for chronic disease include infectious agents that are responsible for cervical and liver cancers, and some environmental factors, such as air pollution, which contribute to a range of chronic diseases including asthma and other chronic respiratory diseases.

PSYCHOSOCIAL AND GENETIC FACTORS ALSO PLAY A ROLE.

- **Childhood risk**
There is now extensive evidence from many countries that conditions before birth and in early childhood influence health in adult life. For example, low birth weight is now known to be associated with increased rates of high blood pressure, heart disease, stroke and diabetes.
- **Risk accumulation**
Ageing is an important marker of the accumulation of modifiable risks for chronic disease: the impact of risk factors increases over the life course.
- **Underlying determinants**
The underlying determinants of chronic diseases are a reflection of the major forces driving social, economic and cultural change – globalization, urbanization, population ageing, and the general policy environment.
- **Poverty**
Chronic diseases and poverty are interconnected in a vicious circle. At the same time, poverty and worsening of already existing poverty are caused by chronic diseases. The poor are more vulnerable for several reasons, including greater exposure to risks and decreased access to health services.
- **Psychosocial stress also plays a role.**

Causes of Chronic Diseases



INFECTIOUS AND NON-INFECTIOUS CAUSES

Infectious diseases (Communicable diseases) :- are diseases which spread from an infected person to a healthy person through air, water, food, vectors, physical contact or sexual contact. Eg :- common cold, chicken pox, mumps, measles, typhoid, cholera, tuberculosis, malaria, AIDS etc.

Non-infectious diseases (Non-communicable diseases) :- are diseases which are not spread from an infected person to a healthy person. Eg :- beri beri, rickets, scurvy, night blindness, diabetes, cancer, high blood pressure etc. 5) Causes of diseases :- Diseases are caused by :- i) Pathogens like virus, bacteria, fungi, protozoans or worms. ii) Poor health and under

nourishment. iii) Malfunctioning of body parts. iv) Environmental pollution. v) Genetic disorders.

INFECTIOUS AGENTS

Infectious diseases are caused by microorganisms such as viruses, bacteria, fungi or parasites and can spread between individuals.

Microorganisms that cause disease are collectively called pathogens.

Pathogens cause disease either by disrupting the bodies normal processes and/or stimulating the immune system to produce a defensive response, resulting in high fever, inflammation and other symptoms.

Infectious diseases can be spread from one person to another, for example through contact with bodily fluids, by aerosols (through coughing and sneezing), or via a vector, for example a mosquito.

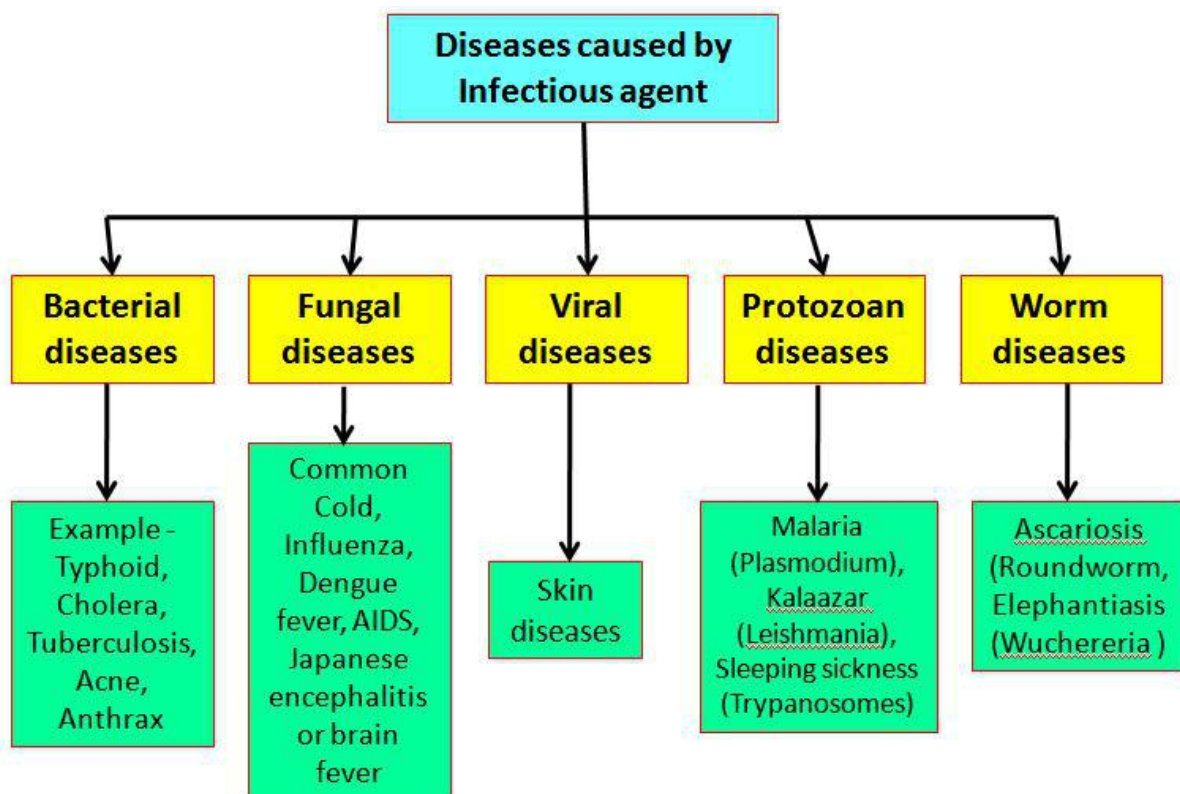
Infectious diseases can be caused by:

Bacteria. These one-cell organisms are responsible for illnesses such as strep throat, urinary tract infections and tuberculosis.

Viruses. Even smaller than bacteria, viruses cause a multitude of diseases — ranging from the common cold to AIDS.

Fungi. Many skin diseases, such as ringworm and athlete's foot, are caused by fungi. Other types of fungi can infect your lungs or nervous system.

Parasites. Malaria is caused by a tiny parasite that is transmitted by a mosquito bite. Other parasites may be transmitted to humans from animal feces.



MEANS OF SPREAD

Infectious diseases spread from an infected person to a healthy person through air, water, food, vectors, physical contact and sexual contact.

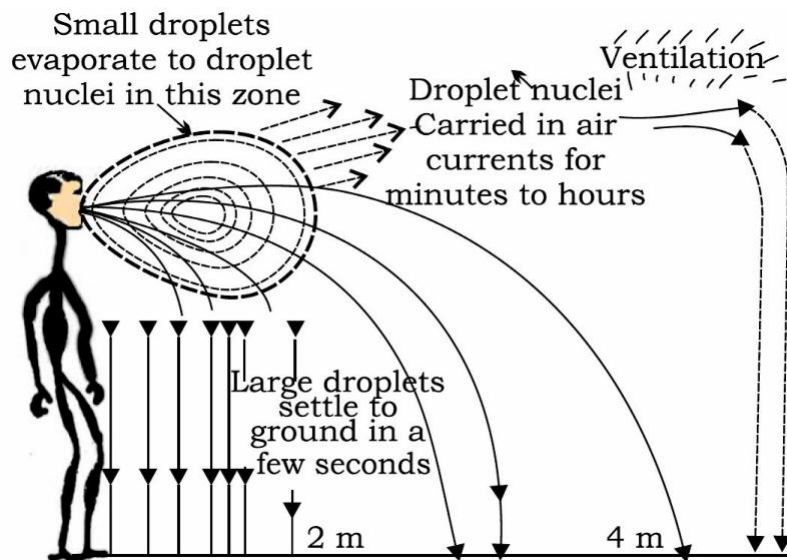
Through air :- Common cold, Tuberculosis, Pneumonia etc.

Through water :- Cholera, Amoebic dysentery etc.

Through vectors :- Mosquitoes :- Malaria, Dengue, Yellow fever etc. Flies :- Typhoid, Tuberculosis, Diarrhoea, Dysentery etc.

Through sexual contact :- Syphilis, AIDS. AIDS virus can also spread through blood transfusion and from the mother to her child during pregnancy and through breast feeding.

The below figure shows how Air-transmitted diseases are easier to catch the closer we are to the infected person. However, in closed areas, the droplet nuclei recirculate and pose a risk to everybody. Overcrowded and poorly ventilated housing is therefore a major factor in the spread of airborne diseases.



Disease can also be spread through water. This occurs if the excreta from someone suffering from an infectious gut gets mixed with water. Eg cholera, gets mixed with the drinking water used by people living near by. The cholera causing microbes will enter new hosts through the water they drink and cause disease in them. Such diseases are much more likely to spread in the absence of safe supplies of drinking water.

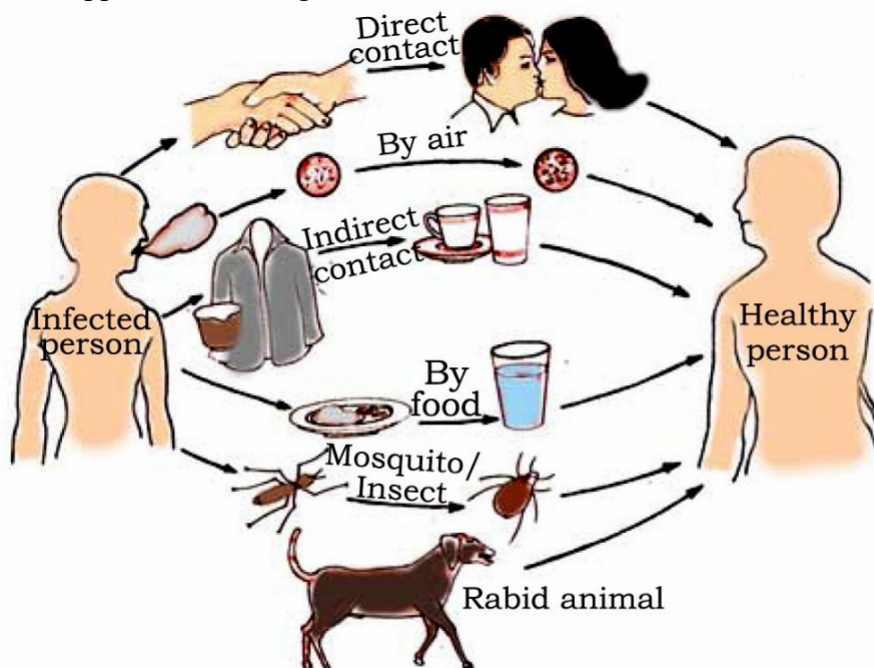


Fig. Common methods of transmission of diseases.

The sexual act is one of the closest physical contacts two people can have with each other. Not surprisingly, there are microbial diseases such as syphilis or AIDS that are transmitted by sexual contact from one partner to the other. However, such sexually transmitted diseases are not spread by casual physical contact. Casual physical contacts include handshakes or hugs or sports, like wrestling, or by any of the other ways in which we touch each other socially. Other than the sexual contact, the AIDS virus can also spread through blood to blood contact with infected people or from an infected mother to her baby during pregnancy or through breast feeding.

ORGAN-SPECIFIC AND TISSUESPECIFIC MANIFESTATIONS

Disease causing microbes enter the body by different means and goes to different organs and tissues.

- Microbes which enters through the nose are likely to go to the lungs. (Bacteria which cause tuberculosis of lungs).
- Microbes which enter through the mouth are likely to stay in the gut (Bacteria which causes Typhoid) or liver (Bacteria which causes Jaundice).
- Virus which causes AIDS enter the body through sexual organs during sexual contact and spreads through the lymph to all parts of the body and damages the immune system.
- Malaria-causing microbes, entering through a mosquito bite, will go to the liver, and then to the red blood cells.
- The virus causing Japanese encephalitis, or brain fever, will similarly enter through a mosquito bite goes and infects the brain.

PRINCIPLES OF TREATMENT

The treatment of infectious diseases consists of two steps. They are to reduce the effects of the disease (symptoms) and to kill the microbes which caused the disease.

To reduce the effects of the disease :- This can be done by taking medicines to bring down the effects of the disease like fever, pain or loose motions etc. and by taking bed rest to conserve our energy.

To kill the microbes :- This can be done by taking suitable antibiotics and drugs which kills the microbes and the disease is cured.

PRINCIPLES OF PREVENTION

There are two ways of prevention of infectious diseases. They are general ways and specific ways.

General ways of prevention :- Public hygiene is most important for prevention of infectious diseases. Proper and sufficient food for every one will make people healthy to resist infection. Air borne diseases can be prevented by living in conditions that are not crowded. Water borne diseases can be prevented by providing safe drinking water. Vector borne diseases can be prevented by providing clean environment.

Specific ways of prevention :- The specific ways to prevent infectious disease is immunisation by taking vaccines. Vaccines provide immunity from infectious diseases like tetanus, diphtheria, whooping cough, measles, polio etc. Our body has an immune system which fights microbial infection. When this system first sees an infectious microbe, it kills the microbe and remembers it. So if the microbe enters the body the next time, it responds more vigorously. Vaccines mimic the infectious microbe and strengthens our immune system and protects the body from infectious diseases.

IMMUNISATION

Immunisation gives a very good level of protection against many serious diseases.

It uses your body's natural defence mechanism, the immune response, to build resistance to specific infection.

There are three reasons why we immunise children.

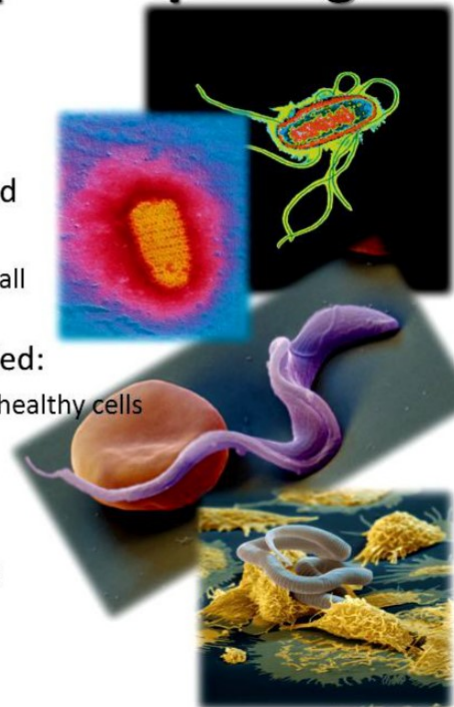
- **First**, immunisation prevents children from becoming ill with unpleasant and serious infectious diseases, which have a risk of complications and long-term side effects.
- **Second**, we immunise to try and help protect all children in the population. The more people who are immunised, the less of the infectious disease there is around so the less chance there is of anyone catching it. When levels of immunisation against an infectious disease are really, really high - then something happens called 'herd immunity' where the risk of the disease occurring is so low that even those who cannot be immunised are unlikely to be affected.
- **Third**, we immunise to try and wipe out as many infectious diseases as we can everywhere in the world.

National Immunization Schedule

For Infants	Vaccine & Dose	Route
At Birth	BCG 0.1ml + OPV 2drops(0 dose)	Intradermal
6 weeks	BCG 0.1ml [if not at birth]	Intradermal
10 weeks	DPT-1 0.5ml + OPV-1 2drops	I/M + Oral
14 weeks	DPT-2 + OPV-2	I/M + Oral
9-12 months	DPT-3 + OPV-3	I/M + Oral
	Measles 0.5ml + Vit. A 2ml	Deep S/C + Oral
At 18 months	DPT + OPV[Boosters-1]	I/M + Oral
At 24, 30, 36 months	Vitamin A 2ml	Oral
At 5-6 years	DT[Booster-2]	I/M
At 10 and 16 years	Tetanus Toxoid	I/M
For Pregnant Women	Vaccine & Dose	Route
Early in Pregnancy	TT-1 or Booster	I/M
One month after TT-1	TT-2	I/M

There are different types of pathogens

- **Bacteria** are single-celled organisms:
 - Cause illness by destroying cells, release toxic chemicals
 - Ex: Food poisoning, MRSA
- **Viruses** are genetic material surrounded by a protein coat:
 - Force host cells to make more viruses, small
 - Ex: Flu, Cold, HIV
- **Fungi** can be multicellular or single-celled:
 - Take nutrients from host cells by piercing healthy cells
 - Occur in warm and damp places
 - Ex: Athlete's foot
- **Protozoa** are single-celled organisms.
 - Use host cells to complete their life cycles
 - Take nutrients from host cell
 - Ex: Malaria



Review: Parasite

Means of spread of infectious diseases :-

Infectious diseases spread from an infected person to a healthy person through air, water, food, vectors, physical contact and sexual contact.

i) Through air :- Common cold, Tuberculosis, Pneumonia etc.

ii) Through water :- Cholera, Amoebic dysentery etc.

iii) Through vectors :-

Mosquitoes :- Malaria, Dengue, Yellow fever etc.

Flies :- Typhoid, Tuberculosis, Diarrhoea, Dysentery etc.

iv) Through sexual contact :- Syphilis, AIDS.

AIDS virus can also spread through blood transfusion and from the mother to her child during pregnancy and through breast feeding.