

CHAPTER 4 HUMAN HEALTH

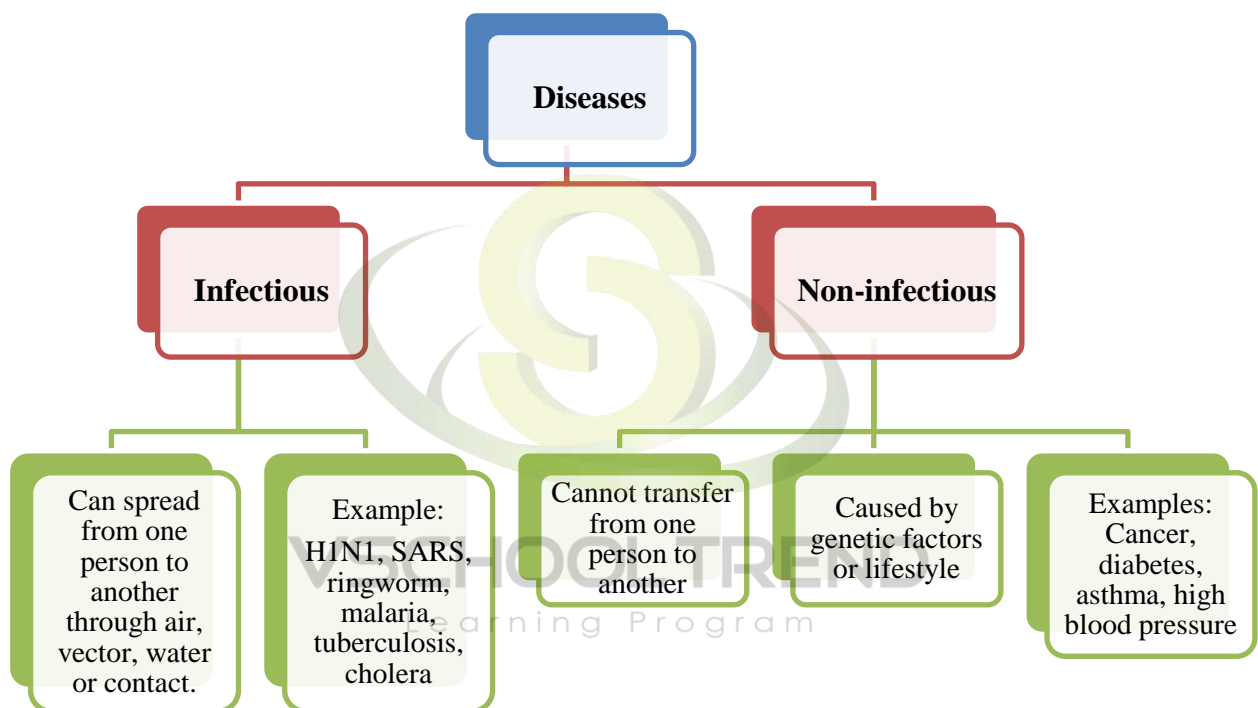
Learning Outcomes:

1. To learn about infectious and non-infectious diseases
2. To learn about body defence



4.1 Infectious and non-infectious diseases

1. A disease is an abnormal condition of the body or mind that causes discomfort, difficulty in functioning or pressure to a particular individual involved.



✚ Transmission of infectious diseases

(A) Through air

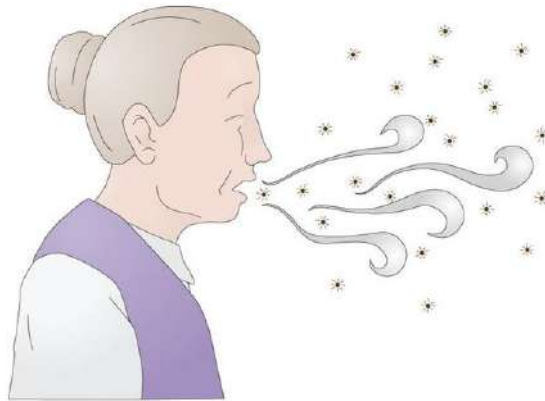
1. There are two ways whereby this type of transmission can happen.
 - (i) Droplet transmission
 - Splashes of water containing pathogens come out from mouth and nose when sneezing, coughing, talking, yawning or breathing.
 - An individual who inhales this contaminated air may be infected by diseases.
 - It is easily spread in crowded condition and humid environment.

(ii) Dust transmission

- When spit from a patient dries up, the bacteria in it forms spores and spread together with dust through the air.
- People who inhale this air will be infected.

2. Example of airborne diseases:

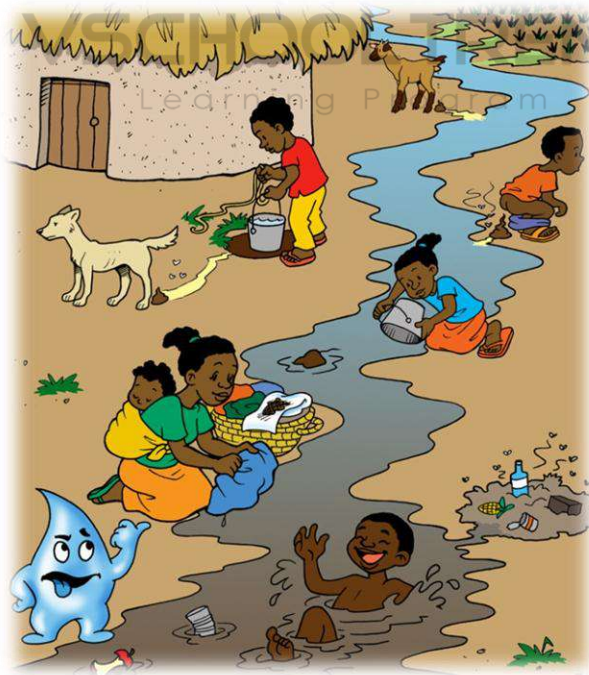
Tuberculosis (TB), H1N1, influenza and severe acute respiratory syndrome (SARS)



(B) Through water

1. Transmission through water usually occurs in areas that do not have clean water supply and a perfect sanitation system.
2. Flood could spread infectious diseases.
3. Example of waterborne diseases:

Cholera, typhoid fever and amoebic dysentery

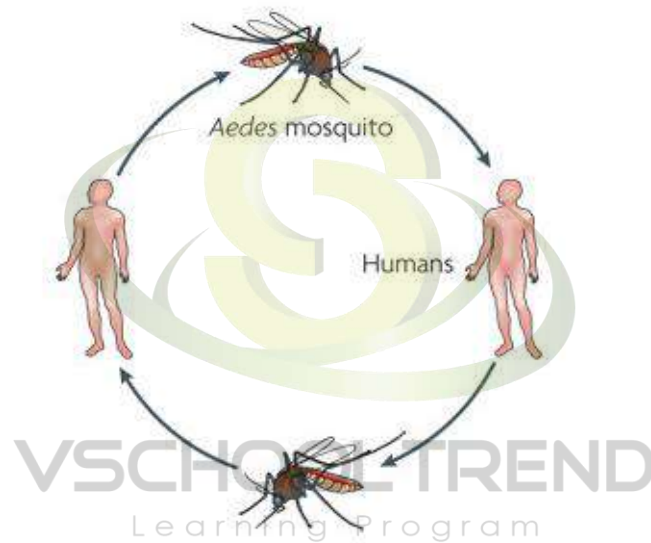


(C) Through contact

1. Two types of diseases that can be transmitted via contact are ringworm and tinea. They are caused by fungus.
2. Other than that, diseases like AIDS, syphilis and gonorrhea are transmitted through human fluids such as vaginal fluid and semen during sexual intercourse, open wounds, blood transfusion and from a mother to her child in the womb.

(D) Through vector

1. Vectors are agents that carry the disease-causing organisms. Examples of vectors are mosquitoes, rats, cockroaches, lice and flies.
2. Dengue, malaria and Zika are transmitted by mosquitoes.



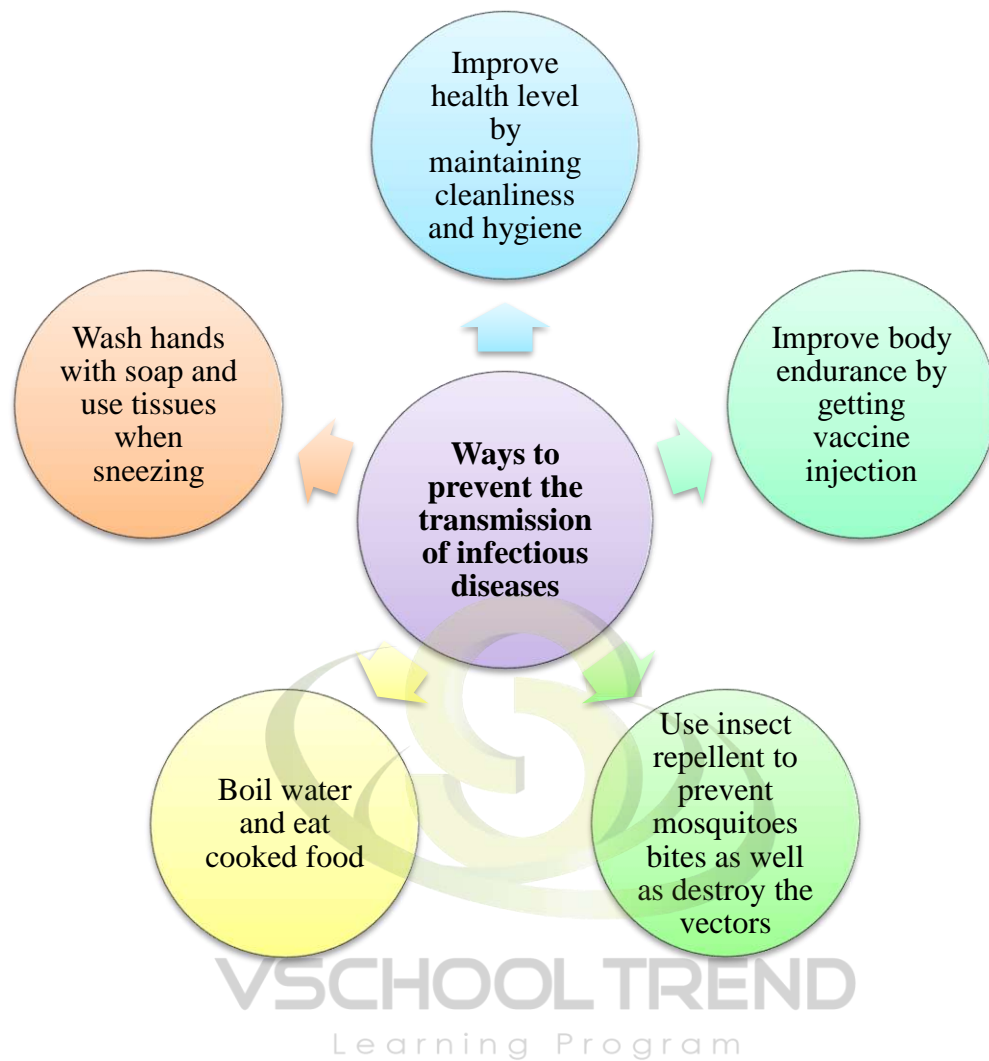
Example: An Aedes mosquito bites a dengue patient. It then bites a healthy individual. Hence, the healthy individual is infected with dengue.

3. Leptospirosis is transmitted by rats.



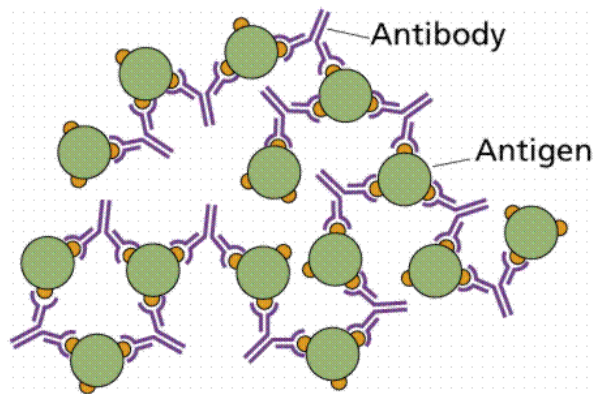
Infected rat has bacteria in its urine. The rat urine enters water sources. The water sources transmit the bacteria to other organisms.

Ways to prevent the transmission of infectious diseases



4.2 Body defence

1. Immunity is the ability of the body to fight against diseases.
2. Antigen is a foreign substance that enters the body and causes a disease. The antigen can stimulate the body's defence system to produce antibodies that can destroy the antigen.



✚ Importance of immunisation

1. Immunisation or vaccination is the process of stimulating the body's defence against infections in babies, children and adults by injecting vaccines.
2. Vaccines contain dead or weak pathogens that stimulate the immune system to produce antibodies that can destroy antigens.
3. The repetition of immunisation (booster dose) is important to increase the concentration of antibody to be above the immunity level.

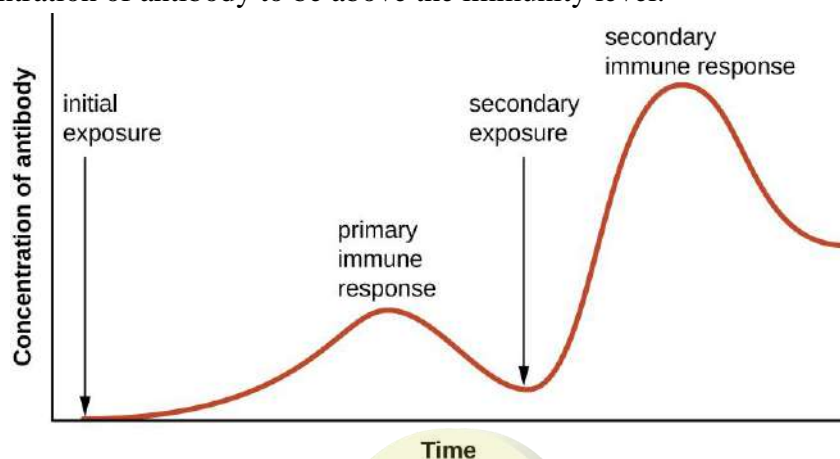


Diagram 4.1 Graph of primary and secondary immunisation response

4. The primary immune response occurs when the body defence system reacts towards an antigen for the first time. During this time, the body defence system identifies the antigen and produces antibodies specific to that antigen. The antibodies will remain in the memory of the body defence system.
5. The secondary immune response occurs when the individual is infected with the same antigen again. During this time, the body defence system, which has the memory of the antigen, will immediately produce antibodies to react against the antigen.

Age	Vaccine injection	Prevents
At birth	BCG (Bacillus Calmette-Guerin)	Tuberculosis
	Hepatitis B: Dose 1	Liver cancer and damaged liver
1 month	Hepatitis B: Dose 2	
2 months	Diphtheria, Tetanus, Pertussis (DTaP): Dose 1	Diphtheria, Tetanus (lockjaw), Pertussis (whooping cough)
	Haemophilus influenza type B (Hib): Dose 1	Meningitis, pneumonia
	Poliomyelitis (IPV): Dose 1	Polio
3 months	DTaP: Dose 2	Diphtheria, Tetanus (lockjaw), Pertussis (whooping cough)
	Hib: Dose 2	Meningitis, pneumonia
	IPV: Dose 2	Polio

5 months	DTaP: Dose 3	Diphtheria, Tetanus (lockjaw), Pertussis (whooping cough)
	Hib: Dose 3	Meningitis, pneumonia
	IPV: Dose 3	Polio
6 months	Hepatitis B: Dose 3	Liver cancer and damaged liver
9 months	Measles, Mumps, Rubella (MMR): Dose 1	Measles, Mumps, Rubella
	Japanese Encephalitis (JE): Dose 1	Brain infection
12 months	MMR: Dose 2	Measles, Mumps, Rubella
18 months	DTaP booster	Diphtheria, Tetanus (lockjaw), Pertussis (whooping cough)
	Hib booster	Meningitis, pneumonia
	IPV booster	Polio
7 years	Mumps and Rubella (MR): Dose 2	Mumps, Rubella
13 years	Human Papillomavirus (HPV): Dose 1 & 2	Cervix cancer (females only)
15 years	Tetanus booster	Tetanus

Table 4.1 Table of immunisation from Ministry of Health in Malaysia

✚ Passive and active immunity

1. There are two types of immunity, which are natural and artificial immunity. Both of these types of immunity can be received passively or actively.

Active immunity	
Natural	Artificial
<ul style="list-style-type: none"> ➤ Immunity obtained after a person recovers from a disease. ➤ Immunity lasts long after infection. ➤ E.g. chicken pox 	<ul style="list-style-type: none"> ➤ Immunity obtained from vaccine injection. ➤ Produced when the body defence system responds by producing antibodies when dead or weak antigens are injected into the body. ➤ Immunity lasts long after infection. ➤ E.g. Measles and BCG vaccines

Passive immunity	
Natural	Artificial
<ul style="list-style-type: none"> ➤ Immunity obtained from the mother. Baby receives antibodies from the mother's milk or through placenta. ➤ Immunity is short and temporary for baby. 	<ul style="list-style-type: none"> ➤ Immunity received from an antiserum injection which contains antibodies. ➤ Immunity is fast and temporary. ➤ Injection is given to someone with a disease or high risk of being infected. ➤ E.g. Rabies

Table 4.2 Passive and active immunity