

Chapter 5: Communicable diseases

Knowledge organiser

Communicable diseases

Communicable diseases can be spread from one organism to another.

Viruses live and reproduce rapidly inside an organism's cells. This can damage or destroy the cells.

| Viruses | Spread by | Symptoms |
|-------------------------------------|--|--|
| measles | inhalation of droplets produced by infected people when sneezing and coughing | <ul style="list-style-type: none"> fever red skin rash complications can be fatal – young children are vaccinated to immunise them against measles |
| HIV (human immunodeficiency virus) | <ul style="list-style-type: none"> sexual contact exchange of body fluids (e.g., blood when drug users share needles) | <ul style="list-style-type: none"> flu-like symptoms at first virus attacks the body's immune cells, which can lead to AIDS – where the immune system is so damaged that it cannot fight off infections or cancers |
| TMV (tobacco mosaic virus – plants) | <ul style="list-style-type: none"> direct contact of plants with infected plant material animal and plant vectors soil: the pathogen can remain in soil for decades | <ul style="list-style-type: none"> mosaic pattern of discolouration on the leaves – where chlorophyll is destroyed reduces plant's ability to photosynthesise, affecting growth |



Bacteria reproduce rapidly inside organisms and may produce **toxins** that damage tissues and cause illness.

| Bacteria | Spread by | Symptoms | Prevention and treatment |
|------------|---|---|---|
| Salmonella | bacteria in or on food that is being ingested | <i>Salmonella</i> bacteria and the toxins they produce cause <ul style="list-style-type: none"> fever abdominal cramps vomiting diarrhoea | poultry are vaccinated against <i>Salmonella</i> bacteria to control spread |
| gonorrhoea | direct sexual contact – gonorrhoea is a sexually transmitted disease (STD) | <ul style="list-style-type: none"> thick yellow or green discharge from the vagina or penis pain when urinating | <ul style="list-style-type: none"> treatment with antibiotics (many antibiotic-resistant strains have appeared) barrier methods of contraception, such as condoms |



| Fungi | Spread by | Symptoms | Prevention and treatment |
|-----------------|----------------|---|--|
| rose black spot | water and wind | <ul style="list-style-type: none"> purple or black spots on leaves, which turn yellow and drop early reduces plant's ability to photosynthesise, affecting growth | <ul style="list-style-type: none"> fungicides affected leaves removed and destroyed |



| Protists | Spread by | Symptoms | Prevention and treatment |
|----------|--|---|---|
| malaria | mosquitos feed on the blood of infected people and spread the protist pathogen when they feed on another person – organisms that spread disease by carrying pathogens between people are called vectors | <ul style="list-style-type: none"> recurrent episodes of fever can be fatal | <ul style="list-style-type: none"> prevent mosquito vectors breeding mosquito nets to prevent bites anti-malarial medicine |

Detection and identification of plant diseases

Signs that a plant is diseased

- stunted growth
- spots on leaves
- areas of rot or decay
- growths
- malformed stems or leaves
- discolouration
- pest infestation

Ways of identifying plant diseases

- gardening manuals and websites
- laboratory testing of infected plants
- testing kits containing monoclonal antibodies (Chapter 9 *Monoclonal antibodies*)

Controlling the spread of communicable disease

There are a number of ways to help prevent the spread of communicable diseases from one organism to another.

| Hygiene | Isolation | Controlling vectors | Vaccination |
|---|--|---|--|
| Hand washing, disinfecting surfaces and machinery, keeping raw meat separate, covering mouth when coughing/sneezing, etc. | Isolation of infected individuals – people, animals, and plants can be isolated to stop the spread of disease. | If a vector spreads a disease destroying or controlling the population of the vector can limit the spread of disease. | Vaccination can protect large numbers of individuals against diseases. |

Key terms

Make sure you can write a definition for these key terms.

bacterium communicable disease fungicide fungus
 isolation mimic pathogen protist
 sexually transmitted disease (STD) toxin vaccination vector virus

Chapter 5: Communicable diseases

Retrieval questions

Learn the answers to the questions below then cover the answers column with a piece of paper and write as many as you can. Check and repeat.

B5 questions

Answers

| | | |
|----|--|--|
| 1 | What is a communicable disease? | a disease that can be transmitted from one organism to another |
| 2 | What is a pathogen? | a microorganism that causes disease |
| 3 | Name four types of pathogen. | bacteria, fungi, protists, viruses |
| 4 | How can pathogens spread? | air, water, direct contact |
| 5 | How do bacteria make you ill? | produce toxins that damage tissues |
| 6 | How do viruses make you ill? | reproduce rapidly inside cells, damaging or destroying them |
| 7 | Name three examples of viral diseases. | measles, HIV, tobacco mosaic virus |
| 8 | Name two examples of bacterial diseases. | <i>Salmonella</i> , gonorrhoea |
| 9 | Name four methods of controlling the spread of communicable disease. | good hygiene, isolating infected individuals, controlling vectors, vaccination |
| 10 | Describe an example of a protist disease. | malaria – caused by a protist pathogen that is spread from person to person by mosquito bites, and causes recurrent fevers |
| 11 | Describe an example of a fungal disease in plants. | rose black spot – spread by water and wind, and affects plant growth by reducing a plant's ability to photosynthesise |
| 12 | How can the cause of a plant disease be identified? | gardening manuals and websites, laboratory testing, monoclonal antibody kits |
| 13 | How can plant diseases be detected? | areas of decay, discolouration, growths, malformed stems or leaves, presence of pests, spots on leaves, and stunted growth |