

### **Infectious Diseases:**

Definitions: A disease is a condition that causes the body to function less effectively. Diseases produce specific signs or symptoms. They are also known as transmissible diseases. They can be spread from one person to another and are caused by pathogens.

(refer to sch given notes too)

Examples of infectious diseases: Influenza (flu), HIV, pneumococcal disease, AIDS (via sex and body fluids)

Pathogen: Viruses, bacteria... These are disease-causing organisms.

Virus: Made up of genetic material enclosed in a protein cloak. It can only reproduce in a host cell (like a parasite). It is NOT a cell and is only considered a disease when it is pathogenic.

Note: HIV is a virus, not a disease.

Bacteria: Has a cell wall. It has DNA and plasmid in the cytoplasm. It also does not have a nucleus. Can reproduce on their own. It is cellular in nature and contains cellular organelles. It is considered a single-cell organism. What allows them to reproduce? They have DNA and ribosomes that can synthesise the proteins needed for a new cell.

### **Symptom vs sign:**

Symptom: Described or felt by patient. It is not observable. Eg: headache, nausea.

Sign: Observable and measurable. Eg: rashes, vomit, fever

Non-infectious diseases are NOT caused by pathogens. They can be hereditary or may be caused by factors such as malnutrition, environmental factors such as malnutrition, environmental factors (pollution) and lifestyle choices

Examples of non-infectious diseases: Cancer, coronary heart disease, liver cirrhosis, type 2 diabetes and sickle cell anaemia.

### **Reducing the spread of infectious diseases:**

Different pathogens have different methods of spread

- some are airborne, like going through the air
- some are transmitted through direct contact
- sexual intercourse for STIs
- contact with bodily fluids like blood from a sick person making contact with mucous membranes like the ones at the eye, nose and mouth
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Prevention:

- washing hands with soap and water
- using a serving spoon when sharing food
- wearing a mask to prevent the spread of bodily fluids (saliva, mucus)
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### **Categories:**

Direct Contact

- a. HIV, syphilis
  - i. transported via sexual intercourse, exchanging bodily fluids
- b. Hep B and syphilis
  - i. from mother to baby through breastfeeding

Airborne Droplets:

### **Treatments:**

Methods for treating Influenza:

- a. antiviral medication (it deals with the symptoms though)
- b. rest and hydration
- c. Management of symptoms, the immune system must destroy the pathogen itself.

Methods for treating Pneumococcal disease:

- a. antibiotics medication

Antibiotics:

- Meant to kill bacteria

Ineffective on viruses because:

- a. They act on bacterial cell walls. Viruses do not have cell walls.
- b. They break up cell membranes, which viruses do not have
- c. They act on ribosomes, inhibiting protein synthesis and growth. Viruses don't have ribosomes and do not grow.

Antibiotic resistance:

- bacteria that are resistant to medicines like antibiotics.
- **It is a characteristic of bacteria, not the patient**
- It stems from variation in bacteria. It already exists among some bacteria (mutation).
- When a prescribed course of antibiotics is not completed, the less sensitive\* bacterial cells would have survived and eventually multiplied in numbers, creating a superbug.

- If the course of antibiotics is completed, it is likely that all the bacteria would have died (yay)

How to reduce antibiotic resistance:

- avoid misusing or overusing antibiotics
- complete the full course of antibiotics prescribed by doctors so that all the bacteria are killed
- Using antibiotics only when necessary

### **Vaccines**

- **they are NOT medication**
- **they can be meant for BOTH bacteria and viruses**

An antigen is part of a pathogen (it can also be found on any cell). Different cells, different antigens.

White blood cells, specifically lymphocytes, produce antibodies when they recognise a foreign substance with a known antigen

The connection between pathogens and antibodies.

A new antigen is introduced with a new virus, which the body does not recognise. Usually, the pathogen is not that harmless and the body can produce antibodies to that antigen. This is where vaccines come in.

What is a vaccine?

They prepare the body to fight pathogens. They contain an agent that resembles a pathogen that has the same antigen. The antigen does not carry the same properties as it would usually have in a pathogen that would infect someone, hence the body would be able to recognise the pathogen due to the antigens and the lymphocytes would be able to produce antibodies in a shorter period of time.

The immune system would remember the pathogen based on the antigens on an agent in a vaccine.

For overview, refer to TB pg 236 flowchart for help.