PATHOGENS

How pathogens cause disease and how your body will try to protect you from it

Pathogens

- Pathogens are microorganism that enter the body and cause disease.
- They cause infections disease – one that can be easily spread (communicable)
- Both plants and animals can be infected by pathogens

Types of pathogens

- Bacteria

Bacteria are extremely small cells which can reproduce rapidly in your body. They produce toxins that make you feel ill by damaging your cells and tissues.

- Virus

Unlike bacteria, viruses are not cells, and they're even smaller than bacteria. However they can reproduce rapidly. They live inside your cells (which is why antibiotics don’t work), they then replicate themselves and eventually, the cell will burst, releasing all the new viruses. The cell damage is what makes you feel ill.

- Protists

Protists are all eukaryotes (cells that contain a nucleus and organelles). Some protists are parasites. They live on or inside other organisms.

- Fungi

Some fungi are single-celled. Others have a body that is made up of hyphae. These can grow and penetrate human skin and the surface of plants, which causes disease.

Transmission of disease

- Water

some pathogens can be spread through bathing or drinking dirty water e.g. cholera is a bacterial infection spread by drinking dirty water contaminated with diarrhoea of other cholera victims.

- Air

Pathogens can be passed by breathing them in. some are carried in droplets that are produced when you cough or sneeze. E.g. flu

- Direct contact

Hyphae (fungi) can produce spores, which can spread to plants and animals. Protists are often transferred by vector, which doesn't carry the disease itself. Also, contact with skin / things others with the disease have touched can cause the disease. E.g. athletes foot

Measles

- Symptoms

Red skin rash. Fever. High temperature. Can sometimes lead to pneumonia or encephalitis

- Transmission

Measles is a viral disease, spread by droplets from an infected persons sneeze/cough. However most people are vaccinated against it when they are young

HIV

- Symptoms

Flu-like symptoms for the first few weeks, but then doesn’t experience symptoms for the next few years. Eventually may develop into aids.

- Transmission

HIV is spread through sexual contact or exchanging bodily fluids such as blood e.g. sharing needles

Tobacco mosaic virus (TMV)

- Symptoms

It affects many species of plant (like tomatoes) and causes a mosaic pattern on the leaves – part of the leaves become discoloured. The discoloured leaves means the plant cannot carry out photosynthesis, so it effects growth.

Salmonella

- Symptoms

Fever, stomach cramps, vomiting and diarrhoea

- Transmission

Food poisoning (from food that caught salmonella while it was alive or was prepared in unhygienic conditions). Most poultry are vaccinated in the uk.

Gonorrhoea

- Symptoms

Pain when urinating, thick yellow/green discharge from gentiles

- Transmission

Sex. Its an std. prevent gonorrhoea by having protected sex.

Rose black spot

- Symptoms

Causes purple/black spots on rose leaves that causes the leaf to drop off. The plant doesn’t grow properly

- Transmission

Water or wind. Can be treated by stripping the leaves

Malaria

- Symptoms

Repeating episodes of fever

- Transmission

Mosquitoes, a vector. It injects the malaria protest into your blood when it feeds on you

Defence system

- Skin acts as a barrier and secretes antimicrobial substances
- Hair and mucus in your nose trap particles that could contain pathogens
- Trachea and bronchi secrete mucus and are lined with cilia
- Stomach is lined with hydrochloric acid

White blood cells

- If pathogens enter your body your white blood cells will act. They will:
- Consume the pathogen (engulf and digest)
- Produce antibodies that lock onto the pathogen and make it ineffective and so the white blood cells can find them to be destroyed.
- Produces antitoxins that invade bacteria

Vaccinations

- Vaccination are small doses of an inactive pathogen that is injected into a person so they can become naturally immune.
- Advantages:
  - *Vaccinations help to control many common communicable diseases, and can completely eradicate it.*
  - *large breakouts of the disease (epidemic) can be prevented if many people are vaccinated against it. People are unlikely to get ill because they are "immune".*
- Disadvantages:
  - *They don't always work (don't always give immunity)*
  - *Sometimes you can have a bad reactions to the vaccine (like swelling, however it can be more serious, like a fever or seizures)*

COVID-19

- Symptoms:
  - *Fever*
  - *Fatigue*
  - *A dry cough*
  - *Loss of appetite*
  - *Body aches*
  - *Shortness of breath*
  - *Mucus or phlegm*
  - *Sore throat*
  - *Headache*
  - *Chills, sometimes with shaking*
  - *Loss of smell or taste*
  - *Stuffy nose*
  - *Nausea or vomiting*
  - *Diarrhoea*
  - *Trouble breathing*
  - *Constant pain or pressure in your chest*
  - *Bluish lips or face*
  - *Sudden confusion*

- Transmission:
  - *The virus can be spread through droplets from an infected persons sneeze or cough. Anyone within 6ft of the infected person could breath in the droplets.*
  - *Studies have shown that the virus can live in the air for up to 3 hours.*
  - *The virus can live on steel or plastic for around 2 – 3 days. If you touch this surface, and then touch your eyes, nose or mouth, you can get infected.*

- There is no exact date for a vaccine for covid-19. many people think it will be at least a year before we get one.

- Currently a lot is being done to avoid the spread of covid-19. There's a lockdown, people can only go out for essential things, and people wearing all sorts of protective gear.