



# Microbes and disease

Since ancient times, microbes have caused widespread disease.

Most diseases occur when the body's defences are overwhelmed by invading germs. This is true for both plants and animals. Sometimes when this happens, great damage can be done. Most diseases are spread by poor hygiene or by sneezing and coughing (Pictures 1, 2 and 3).

Here is the science behind some famous diseases.

## Black Death

This is also called the bubonic plague. It has spread through many continents in the past. One of the worst outbreaks was in the 14th century, when it killed a third of the population of Europe.

Bubonic plague is caused by a bacterium carried by the fleas that live on rats. From time to time, an outbreak kills many rats and then fleas look for humans instead. This is when bubonic plague becomes widespread in people.

► (Picture 1) Diseases such as the bubonic plague can be transmitted by animals such as rats. Both rats and humans can catch bubonic plague and die.

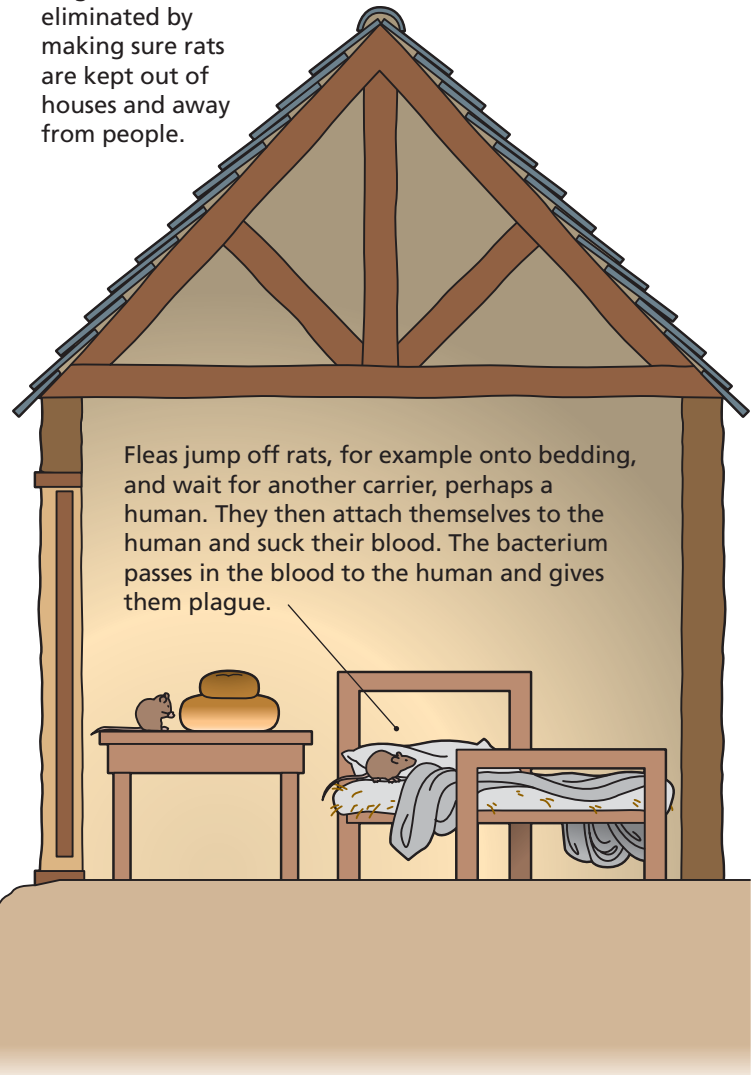
Fleas on rats carry the plague bacteria and can pass it to people if rats and people share the same areas.

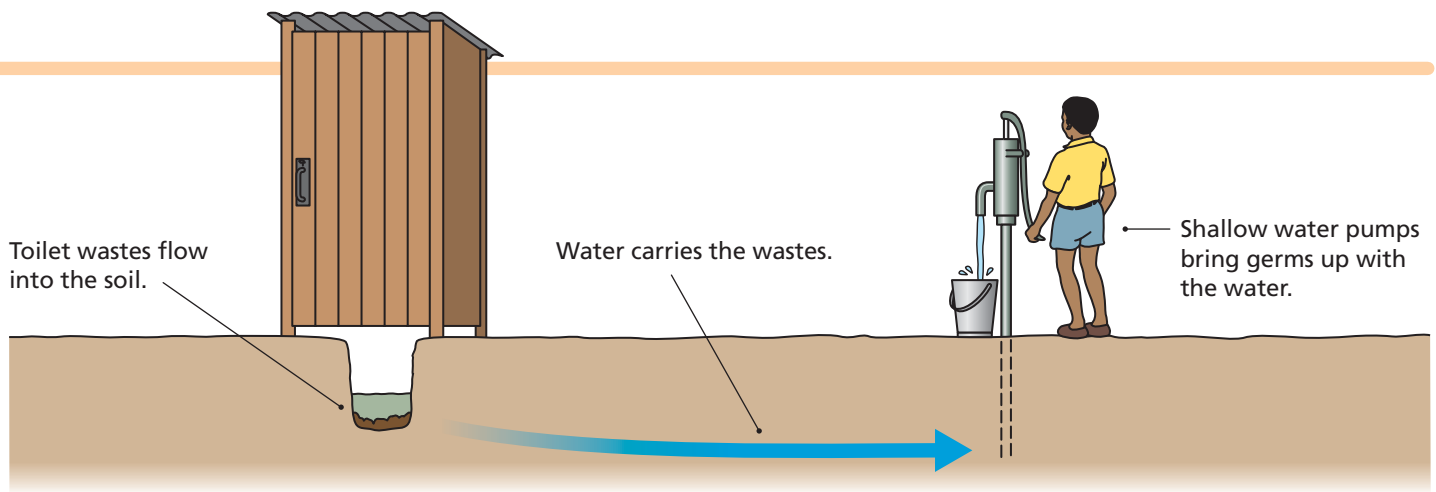
Rats scurry about and pass fleas from one to another.

## Potato famine

The cause of the great famine in Ireland in 1844 and 1845 was the failure of the potato crop. This occurred when a fungus spread through the crop, killing many plants. The result was that many people did not have enough to eat and starved or migrated to other countries.

Plague can be eliminated by making sure rats are kept out of houses and away from people.





## Influenza epidemic

Influenza is a modern virus that regularly kills thousands, and sometimes millions. For example, between 1918 and 1919 influenza killed more than 20 million people. This was more than died in the four years of World War I.

## Malaria

Malaria is a tropical disease caused by a protozoan. Malaria affects millions of people every year. The protozoan lives in the blood. It is carried between animals by a blood-sucking mosquito.

## Aids

Aids is caused by a virus that destroys the cells that normally attack invading germs. It is called the human immunodeficiency virus, or HIV. Like many viruses, this virus can change rapidly, making it hard to kill. It does not travel in air or water, but only in human body fluids. The only way to prevent Aids is by making sure that fluids from one infected person are not carried to another.

▲ (Picture 2) Many diseases, such as cholera, are spread in the water supply, especially when liquids from toilets flow into drinking water supplies.



▲ (Picture 3) When somebody has a cold or the flu (influenza), and sneezes or coughs, then some of the viruses that cause the illness are sent out into the air. Their spread is reduced by using a handkerchief.

### Summary

- Microbes have been responsible for large numbers of deaths – often called plagues.
- Microbes can be spread by poor hygiene.
- Microbes can also be spread in the air.