

Health and disease

Give the WHO definition of health.

Health and disease

What three types of well-being does the WHO definition of health include?

Health and disease

What is a communicable disease?

Health and disease

What is a non-communicable disease?

Health and disease

How does HIV make a person more likely to get other diseases?

Health and disease

Give one other way a disease can make another disease more likely.

Health and disease

What does a correlation on a scatter diagram show, and what does it not prove?

Pathogens and infections

What is a pathogen?

Physical, mental and social.

A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

A disease that cannot be passed from one person to another and is not caused by a pathogen. Example: cardiovascular disease.

A disease caused by a pathogen that can be passed from one organism to another.

Damaged skin or airway lining lets pathogens in; or long-term physical illness can lead to poor mental health.

It destroys white blood cells, so the immune system is weakened and cannot fight other pathogens, such as the TB bacterium.

A disease-causing organism.

It shows that two variables change together. It does not prove that one causes the other.

Pathogens and infections

Name the four types of pathogen.

Pathogens and infections

Cholera: pathogen type and effect?

Pathogens and infections

Tuberculosis: pathogen type and effect?

Pathogens and infections

Chalara ash dieback: pathogen type and effect?

Pathogens and infections

Malaria: pathogen type and effect?

Pathogens and infections

HIV: pathogen type and effect?

Pathogens and infections **Triple only**

Stomach ulcers: which pathogen causes them?

Pathogens and infections **Triple only**

Ebola: pathogen type and effect?

Bacterium; causes diarrhoea.

Viruses, bacteria, fungi and protists.

Fungus; causes leaf loss and bark lesions in ash trees.

Bacterium; causes lung damage.

Virus; destroys white blood cells, leading to the onset of AIDS.

Protist; causes damage to the blood and liver.

Virus; causes haemorrhagic fever.

Helicobacter, a bacterium.

Pathogens and infections

How is cholera spread and how can this be reduced?

Pathogens and infections

How is tuberculosis spread and how can this be reduced?

Pathogens and infections

How is Chalara ash dieback spread and how can this be reduced?

Pathogens and infections

What is a vector? Name the vector for malaria.

Pathogens and infections **Triple only**

How are stomach ulcers (*Helicobacter*) spread and how can this be reduced?

Pathogens and infections **Triple only**

How is Ebola spread and how can this be reduced?

Pathogens and infections **Triple only**

Describe the lytic pathway of a virus.

Pathogens and infections **Triple only**

Describe the lysogenic pathway of a virus.

Airborne, in droplets from coughs and sneezes. Reduce by isolating infected people and covering the mouth when coughing.

In contaminated water. Reduce by clean drinking water and sewage treatment.

An organism that carries a pathogen from one host to another. The mosquito is the malaria vector.

Airborne spores. Reduce by destroying infected trees and restricting movement or import of ash plants.

By contact with body fluids. Reduce by isolating patients and wearing protective clothing.

By oral transmission, for example swallowing bacteria in food or water. Reduce by good hygiene.

Viral genetic material joins the host DNA and stays dormant, copied when the cell divides, until it is triggered to become active.

Viral genetic material takes over the host cell, new viruses are made, the cell bursts and releases them.

Pathogens and infections

How is chlamydia spread and how can this be reduced?

Pathogens and infections

How is HIV spread and how can this be reduced?

Plant defences and plant disease **Triple only**

How does the leaf cuticle protect a plant?

Plant defences and plant disease **Triple only**

How does the cell wall protect a plant?

Plant defences and plant disease **Triple only**

How do chemicals help to defend plants?

Plant defences and plant disease **Triple only**

How can plant chemicals be used by humans?

Plant defences and plant disease

Triple only **Higher tier**

Why eliminate environmental causes when diagnosing a plant disease?

Plant defences and plant disease

Triple only **Higher tier**

What is distribution analysis for plant disease?

Sexual contact, sharing needles, infected blood, mother to baby. Use condoms, do not share needles, screen blood.

Unprotected sexual contact. Use condoms, screen and test, and treat with antibiotics.

It is a strong physical barrier around each cell that pathogens must get past.

It is a waxy layer that forms a physical barrier, stopping pathogens and pests getting in.

Some are used to treat disease or relieve symptoms. For example, aspirin was developed from a chemical in willow bark.

Some kill or slow the growth of microorganisms, and some are poisons that deter pests.

Recording where affected plants are, to see whether the pattern suggests a spreading pathogen or a local environmental cause.

To check that the symptoms are not caused by something like a mineral deficiency or drought rather than a pathogen.

Plant defences and plant disease

Triple only

Higher tier

What are the two other ways of detecting and identifying plant disease?

Human defences and immunity

How do mucus and cilia protect the airways?

Human defences and immunity

How does the skin protect against pathogens?

Human defences and immunity

What are lysozymes?

Human defences and immunity

What does hydrochloric acid in the stomach do?

Human defences and immunity

What is an antigen?

Human defences and immunity

What are antibodies?

Human defences and immunity

What are memory lymphocytes?

Mucus traps pathogens; cilia move the mucus away from the lungs.

Observing visible symptoms, and diagnostic testing to identify the pathogen.

Enzymes that break down bacterial cell walls. A chemical defence.

It is a physical barrier that pathogens cannot easily pass through.

A molecule, usually on the surface of a pathogen, that triggers an immune response.

It kills pathogens that are swallowed. A chemical defence.

White blood cells made after exposure to an antigen that stay in the body and respond quickly if the antigen returns.

Proteins made by white blood cells that bind to specific antigens and help to destroy the pathogen.

Human defences and immunity

Describe the secondary immune response.

Human defences and immunity

How does immunisation protect against a disease?

Human defences and immunity

Why does an inactive pathogen in a vaccine not make you ill?

Human defences and immunity **Triple only**

What is herd immunity?

Human defences and immunity **Triple only**

Give two advantages of immunisation.

Human defences and immunity **Triple only**

Give two disadvantages of immunisation.

Antibiotics, culturing microorganisms and new medicines

Why can antibiotics only treat bacterial infections?

Antibiotics, culturing microorganisms and new medicines

Triple only

What is an autoclave used for?

An inactive pathogen triggers antibody and memory lymphocyte production, so a later infection gets a fast secondary response.

Memory lymphocytes recognise the antigen. The response is faster and produces more antibodies.

When a large proportion of the population is immune, so the pathogen spreads poorly and non-immune people are protected.

It is dead or weakened, so it cannot cause the disease, but its antigens still trigger an immune response.

Side effects can occur; it does not always work or may need boosters.

Protects the individual and reduces the spread of disease; also protects others through herd immunity.

Sterilising growth medium and petri dishes using high-pressure steam.

They inhibit cell processes in the bacterium but not in the host. Viruses live inside host cells.

Antibiotics, culturing microorganisms and new medicines

Triple only

How is an inoculating loop made sterile?

Antibiotics, culturing microorganisms and new medicines

Triple only

Why keep petri dishes and culture vials covered?

Antibiotics, culturing microorganisms and new medicines

Triple only

Core practical: what does a clear zone show?

Antibiotics, culturing microorganisms and new medicines

Triple only

Core practical: why use a control disc soaked in sterile water?

Antibiotics, culturing microorganisms and new medicines

Triple only

Equation for the cross-sectional area of a clear zone?

Antibiotics, culturing microorganisms and new medicines

Name the stages in developing a new medicine in order.

Antibiotics, culturing microorganisms and new medicines

What happens in preclinical and clinical testing?

Antibiotics, culturing microorganisms and new medicines

Triple only

Higher tier

What are monoclonal antibodies?

To stop unwanted microorganisms getting in and the culture escaping.	Heated in a flame until red hot, then cooled before use.
To show that the disc or water alone does not stop bacterial growth.	The substance (antiseptic, antibiotic or plant extract) killed bacteria or stopped them growing. A bigger zone means more effective.
Discovery, development, preclinical testing, clinical testing.	area = πr^2, where r is half the diameter.
Identical antibodies made from one type of cell that bind to one specific antigen.	Preclinical: tested on cells, tissues and live animals. Clinical: tested on people, first for safety and then for effectiveness.

Antibiotics, culturing microorganisms and new medicines

Triple only

Higher tier

How are hybridoma cells made?

Antibiotics, culturing microorganisms and new medicines

Triple only

Higher tier

Why are hybridoma cells useful?

Antibiotics, culturing microorganisms and new medicines

Triple only

Higher tier

Give three uses of monoclonal antibodies.

Antibiotics, culturing microorganisms and new medicines

Triple only

Higher tier

Advantage of monoclonal antibodies over drugs and radiotherapy for cancer?

Non-communicable diseases

What causes many non-communicable diseases?

Non-communicable diseases

What is the BMI equation?

Non-communicable diseases

What does a high waist : hip ratio show?

Non-communicable diseases

How do you calculate waist : hip ratio?

They divide to form many cells and they produce the antibody as they divide.

A lymphocyte that makes the desired antibody (but does not divide) is fused with a tumour cell.

They target specific cells, so fewer healthy cells are damaged.

Pregnancy testing; diagnosis, including locating blood clots and cancer cells; treating diseases including cancer.

$$\text{BMI} = \text{mass (kg)} \div \text{height (m)}^2$$

The interaction of a number of factors, such as lifestyle, environmental and inherited factors.

Waist circumference $\div$ hip circumference, both in the same unit. The ratio has no units.

More fat stored around the waist, linked to a higher risk of cardiovascular disease.

Non-communicable diseases

What are obesity and malnutrition?

Non-communicable diseases

How does drinking too much alcohol affect health?

Non-communicable diseases

How does smoking affect cardiovascular health?

Non-communicable diseases

What are the three levels at which lifestyle effects are considered?

Non-communicable diseases

Name three types of treatment for cardiovascular disease.

Non-communicable diseases

Give a disadvantage of each treatment for cardiovascular disease.

It damages the liver, causing liver disease such as cirrhosis.

Obesity is having too much body fat.
Malnutrition is a diet without the right balance of nutrients.

Local, national and global.

It damages artery linings, leading to fatty build-up and narrowing, and raises heart rate and blood pressure.

Medication: taken for life with side effects.
Surgery: risks and recovery. Lifestyle changes: slow and need effort.

Life-long medication, surgical procedures and lifestyle changes.