The first Public Health Act in 1848	The second Public Health Act in 1875
Cities were encouraged to set up Boards of Health and provide clean water supplies. However, because it was not compulsory many did not	Cities were now forced to improve sanitary conditions by: • providing clean water to stop the spread of disease • disposing of sewage to avoid pollution • building public toilets • employing a public officer of health to monitor conditions and outbreaks of disease • creating street lighting

RAG: Rate the timeline

Below are an exam-style question and a timeline. Read the question, study the timeline and, using three coloured pens, put a red, amber or green star next to the events to show:

Red: events that have **no** relevance to the question

Amber: events that have **some** significance to the question

Green: events that have **direct** relevance to the question

Explain why the government increased its role in preventing disease and illness during the period c.1700–c.1900. (12 marks)

You may use the following in your answer:
- **Cholera**
- **Public Health Acts**

You must also use information of your own.

1796 Edward Jenner discovered the smallpox vaccine

1842 Edwin Chadwick published his *Report on the Sanitary Conditions of the Labouring Classes*

1847 Simpson discovered chloroform as an anaesthetic

1848 First Public Health Act

1852 Government made the smallpox vaccine compulsory

1854 Cholera epidemic

1854 John Snow proved that cholera was caused by dirty water

1858 The Great Stink

1859 Nightingale wrote *Notes on Nursing*

1861 Pasteur published his Germ Theory

1875 Second Public Health Act

1883 Koch discovered the microbe that caused cholera

Spot the mistakes

Below is a paragraph which is part of an answer to the question above. However, the paragraph has a series of factual mistakes. Once you have identified the mistakes, rewrite the paragraph.

In 1846 the British government passed the first Public Health Act. This was because the deadly disease typhoid returned to Britain. The government had listened to the advice from John Snow and passed an Act that would provide vaccinations to its citizens. Unfortunately, it had little impact because the measures were too expensive. When typhoid returned in 1854, Florence Nightingale was able to prove that it was spread by sour milk. But she was unable to explain how or why. In 1861, Robert Koch published his Germ Theory. He did this after experimenting with mice. The new understanding of the cause of disease and illness led to the government passing the second Public Health Act in 1865. This Act was compulsory and shows the change in attitudes towards the individual's role in public health.

c.1900–present: Medicine in modern Britain

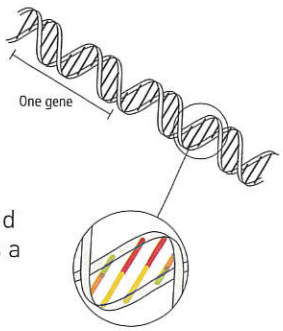
The twentieth century saw great changes in medical diagnosis, treatment and prevention as a result of advancing science and technology. After accepting its responsibility for the health of the people, the government adopted a major role in providing medical care.

1 Ideas about the cause of disease and illness

REVISED

1.1 The influence of genetic factors on health

By 1900, it was clear to scientists that microbes did not cause all disease and illness. The causes of **hereditary diseases** were still unknown. The puzzle of hereditary diseases was solved in 1953 when **DNA** was discovered. It is now understood that Down's syndrome and cystic fibrosis are hereditary diseases.

The discovery of the human gene	Mapping of the human genome
In 1953, James Watson and Francis Crick saw the X-rays of DNA created by Rosalind Franklin and Maurice Wilkins Watson and Crick built their own model of DNA. Franklin corrected it and Wilkins shared clearer images with the team This helped Crick and Watson to understand the structure of DNA: that it was shaped as a double helix 	Once the structure of DNA was understood, scientists were able to break it apart and look at the parts that caused hereditary diseases such as **haemophilia** The Human Genome Project began in 1990 and was completed in 2000. Scientists all over the world worked to decode and map the human **genome**. This map is used to look for mistakes in the human genome of people suffering from genetic conditions
Impact of the discovery The understanding of DNA has not led to the treatment of genetic conditions. However, it has given options to prevent diseases after the identification of particular genes. An example of this is breast cancer. Women can have their breasts removed if the gene linked to the disease is identified in their DNA in order to prevent them from possibly developing cancer	

1.2 The influence of lifestyle factors on health

Our understanding of how lifestyle is linked to disease and illness has improved:

- Smoking is linked to a range of diseases including high blood pressure, cancers and heart disease.
- Diet has a huge impact on our health and we are advised to maintain a healthy food intake. For example, too much sugar can lead to type 2 diabetes and too much fat can lead to heart disease.
- Drinking too much alcohol can lead to liver disease and kidney problems.
- The sharing of bodily fluids, for example by having unprotected sex, can lead to the spread of certain diseases.
- Skin cancer can be caused by too much exposure to the sun without sunscreen.

Key terms

DNA Short for deoxyribonucleic acid. DNA carries genetic information about a living organism. DNA information determines characteristics such as hair and eye colour

Key terms

Genome The complete set of genes (DNA) in a particular organism. Every human being has unique DNA, unless they are identical twins

Haemophilia A medical condition in which the ability of the blood to clot is severely reduced, causing the sufferer to bleed severely from even a slight injury

Hereditary diseases Disease and illness caused by genetic factors and passed on from parents to their children

1.3 Improvements in diagnosis

The development of technology has enabled doctors to understand and diagnose illness and disease more quickly and accurately. Some examples include:

Technology	Description	Examples of use
X-ray	To see inside the human body without cutting it open	Diagnose broken bones
CT and MRI scans	Detailed imaging of internal organs	Diagnose internal damage, tumours and other growths
Ultrasound	A medical image produced from sound	Diagnose kidney stones, image an unborn baby
ECG	Electrocardiograms that measure heart activity	Measure irregular heart movement
Endoscope	A camera on the end of a thin tube used to see inside the body	Investigate digestive problems
Blood testing	Samples of blood are checked	Diagnose illness
Blood pressure monitor	Measures blood pressure	Diagnose high and low blood pressure

Key factor

Science and technology
The development of machines and computers since 1900 has improved diagnosis and allowed for more targeted treatment. Technology is advancing all of the time and so is the way that doctors diagnose disease and illness.

Revision task

Create a mind map of all of the ways that technology has advanced the diagnosis of illness since 1900.

Choosing a third cause

Below is an exam-style question. To answer it you need to explain three causes. It is sensible to make use of the two given points. However, you need to explain a third cause. In the spaces below the question, write down your choice and the reasons behind it.

Explain why there have been changes in understanding the causes of illness during the twentieth century.
(12 marks)

You may use the following in your answer:
- **DNA**
- **Lifestyle**

You must also use information of your own.

Reason: _____

Why I have chosen this reason: _____

Details to support this reason: _____

Complete the paragraph

Below is a paragraph which is part of an answer to the question in the 'Choosing a third cause' activity above. The paragraph gives a cause for change and some historical support but does not go on to develop the explanation.

1 Rewrite the paragraph with extra precise supporting knowledge and a full explanation linking back to the statement.

2 Complete the answer to this question.

Understanding of the cause of illness has changed in the twentieth century as scientists and doctors have increased their understanding of the link between lifestyle and disease and illness. It is now accepted that smoking, diet, alcohol and tanning are the causes of disease. It is now accepted that smoking causes a variety of diseases, such as high blood pressure, a wide range of cancers and heart disease.

2 Approaches to prevention and treatment 1

REVISED

2.1 Advances in medicines

The magic bullet

Magic bullet is used to describe a chemical cure that attacks microbes which cause a particular disease, without side-effects. For example:

- The first magic bullet, Salvarsan 606, was developed in 1909 by Paul Ehrlich as a treatment for syphilis.
- Gerhard Domagk followed in 1932 with the discovery of Prontosil. Prontosil was a cure for blood poisoning.

Antibiotics

In the early twentieth century, the first **antibiotic** was developed as a result of the development of penicillin.

Key terms

Antibiotic A medicine that destroys or limits the growth of bacteria in the human body

D-Day The day (6 June 1944) in the Second World War on which Allied forces invaded northern France by means of beach landings in Normandy

Magic bullet A chemical that kills certain bacteria without harming the body, for example Salvarsan 606 and Prontosil

2.2 Fleming, Florey and Chain's development of penicillin

Discovery	The development of penicillin revolutionised how infection was treated. Alexander Fleming, a British doctor, was researching substances that would cure simple infections. In 1928, Fleming noticed a mould on a dirty Petri dish that had killed the harmful staphylococcus bacteria that was growing in the dish. This mould was penicillin. Fleming published his findings in an article but did not pursue this any further
Development	In 1939, Howard Florey and Ernst Chain were researching antibiotics and they used Fleming's article. They grew their own penicillin mould and began experimenting In 1940, Florey and Chain tested penicillin on infected mice. The penicillin cured the infection In 1941, Florey and Chain had a human patient; a policeman who was suffering from blood poisoning. They began their experiment despite only having a small amount of penicillin. The policeman began to recover Because penicillin was difficult to make in large quantities they did not have enough to treat him for longer, and he died However, Florey and Chain had proven that penicillin could fight infection in a human
Mass production	Florey and Chain needed a factory that could mass produce penicillin and went to the USA for help. The US government funded 21 pharmaceutical companies to mass produce it. By **D-Day**, in June 1944, enough penicillin had been produced to treat all Allied casualties – over 2.3 million doses
Uses of penicillin and antibiotics	Penicillin is used to treat diseases caused by a certain family of bacteria. It is also used to prevent infection The development of other antibiotics followed and these are used daily to treat infections, such as streptomycin to treat tuberculosis and tetracycline to treat skin infections

2.3 High-tech medical and surgical treatment

The development of new machinery since 1900 has improved the treatment in hospitals. New high-tech medical and surgical treatments include:

- Radiotherapy and chemotherapy to target and shrink tumours growing inside the body.
- Dialysis to 'wash' the blood of patients with kidney failure.
- Prosthetic limbs to replace those lost, for example by soldiers in war.
- Transplant surgery, for example transplanting the kidneys, liver and heart.
- Keyhole surgery to prevent cutting into a patient's body.

Revision task

Create a timeline showing the main developments in the treatment of disease and illness since 1900.

Organising knowledge

Use the information on page 26 to complete the table below to show the factors that contributed to the development of penicillin in the twentieth century. First, cross out the factor(s) that did not contribute. Second, explain the role that each remaining factor played. For a reminder about each factor see page 5.

Individuals	
The Church	
The government	
Science and technology	
Attitudes in society	

Identify the view

Read the exam-style question below and identify the view that is offered about the development of penicillin in the early twentieth century.

'The main reason that penicillin was developed in the early twentieth century was because of the work of individuals.' How far do you agree? Explain your answer. (16 marks, with a further 4 marks available for spelling, punctuation and grammar.)

1 What view is offered by the statement about the development of penicillin?

2 How far do you agree? Use your knowledge to agree and disagree with the statement given in the question. To plan an answer to this question, complete the following table.

Knowledge which agrees with the statement	
Knowledge which disagrees with the statement	

3 Now write paragraphs that agree and disagree with the statement.

The statement is partially correct ...

The statement is partially incorrect ...

3 Approaches to prevention and treatment 2

REVISED

3.1 Change in care and treatment

The British government introduced the National Health Service (NHS) in 1948 to provide medical care for all people. It was the largest intervention by the government in medical care, and marked the end of its *laissez-faire* approach (see page 22).

With the NHS, the government aims to provide care for all people 'from the cradle to the grave' through:

- hospitals
- **general practitioners (GPs)**
- dentists
- ambulance services
- health visitors.

Throughout the 1960s, the British government made improvements to the NHS, such as:

- ensuring that hospitals were available across the whole of Britain
- giving GPs incentives to ensure they were up to date with medical developments.

3.2 New approaches to prevention

Mass vaccinations

The government introduced compulsory vaccinations throughout the twentieth century, including diphtheria in 1942 and polio in 1950. These vaccination campaigns were funded by the government to ensure that they were widespread.

Government legislation

The government has passed laws to ensure healthy living conditions. For example:

- The Clean Air Acts of 1956 and 1968 were passed to prevent **smog** caused by air pollution.
- As part of the Health Act of 2006, it was made illegal to smoke in all enclosed workplaces.

Government lifestyle campaigns

The government aims to help people prevent illness themselves through education and by promoting healthier lifestyles. Some examples of this are:

- advertising campaigns that warn against the dangers to health from binge drinking and drug use
- encouraging people to eat more healthily and get more exercise, such as the Change4Life campaign.

Exam tip

You need to be aware of how science and technology has improved all stages of the fight against lung cancer in the twenty-first century.

Key terms

Bronchoscope A fibre-optic cable that is passed into the windpipe in order to view the bronchi

General practitioner (GP) A community-based doctor who treats minor illnesses. A GP will refer more serious cases of illness to a hospital

PET-CT scan A CT scan creates a detailed picture of the inside of the body. A PET-CT scan is similar, but it contains a small amount of radioactive material that is injected instead of dye

Smog A heavy fog caused by air pollution. Although smog is no longer a problem, the government continues to pass laws to protect people from air pollution

Key factors

Science and technology A range of scientific approaches and technology have been developed throughout the twentieth century that diagnose, prevent and treat disease and illness.

Government Throughout the twentieth century, the government has taken a more active role in the prevention and treatment of disease and illness; more recently the focus has been on education and prevention.

3.3 The fight against lung cancer in the twenty-first century

Lung cancer is the second most common cancer in the UK and the number of deaths from this illness have risen throughout the twentieth century.

Diagnosis	By the time the disease is detected it is often too far advanced and so difficult to treat. Technology has enabled improvements. Doctors use a **PET-CT scan** or a dye to identify the cancerous cells. A **bronchoscope** can also be used to collect a sample of the cells
Treatment	If the cancer is detected early an operation to remove the tumour and the infected part of the lung can be carried out. Other treatments include: • transplants – cancerous cells can be replaced with those from a healthy donor • radiotherapy – waves of radiation are aimed at the tumour to shrink it • chemotherapy – patients are injected with different drugs to shrink the tumour before surgery to prevent the recurrence of cancer or to relieve the symptoms when surgery is not possible
Prevention	Evidence that cigarette smoking was linked to lung cancer was first published in 1950, but the government was slow to respond. As the death rate became too high to ignore, the government took the following action: • banned smoking in all public places in 2007, extended to cars carrying children in 2015 • raised the legal age for buying tobacco from 16 to 18 in 2007 • banned tobacco advertising in 1965, and banned cigarette advertising entirely in 2005 • removed cigarette products from display in shops in 2012 • introduced stop smoking campaigns and insisted on plain packaging Each year there is an increase in the taxation on tobacco products to encourage people to stop smoking

The comparison question

Look at the exam-style question below and the two answers. Which answer is better for comparing the key features of medical understanding? Why?

Explain one way in which the prevention of disease and illness was different in the nineteenth and twenty-first centuries. (4 marks)

ANSWER 1

In the nineteenth century, the British government took a *laissez-faire* approach to preventing disease and illness, believing it was not its responsibility. However, by the twenty-first century, the British government no longer had a *laissez-faire* approach to the health of its people and took action in preventing disease and illness by educating the people so that they could take control. This can be seen in the government-encouraged campaigns making the population aware of the dangers of smoking, binge drinking and drug use. It can also be seen in the Change4Life campaign.

ANSWER 2

In the nineteenth century, the British government did not take action preventing and treating disease and illness as it did not believe it was its responsibility. However, by the twenty-first century, the British government no longer had this approach and believed that it should educate the people so that they could take control. This can be seen in the government-encouraged campaigns making the population aware of the dangers of smoking, binge drinking and drug use.

Part 2 The British sector of the Western Front, 1914–18: injuries, treatment and the trenches

1 The context of the British sector of the Western Front

REVISED

Flanders and northern France

The Ypres Salient The scene of many battles during the First World War because it was on the way to the Channel ports of Calais and Dunkirk. The Germans wanted to capture these ports to cut off supplies to the British army The **Ypres Salient** was vulnerable because the Germans had the advantageous position on higher ground. The German army could see the Allied movements and build stronger defences Tunnelling and mines were used by the British at Hill 60, a man-made hill captured by the Germans, to regain control in April 1915 The first Battle of Ypres took place between October and November 1914 The second Battle of Ypres (April to May 1915) saw the first use of chlorine gas by the Germans The third Battle of Ypres took place in July to November 1917	**The Somme** The Battle of the Somme lasted from July to November 1916 and took place along the River Somme It is remembered for its high casualty rate. On the first day of the battle the British army suffered nearly 60,000 casualties and 20,000 dead In total there were over 400,000 Allied casualties. This put enormous pressure on the medical services on the Western Front
Arras The Battle of Arras took place in April 1917 Before the battle, Allied soldiers had dug a network of tunnels below Arras. The tunnelling was made easy by the chalky ground. New tunnels joined with existing tunnels, caves and quarries. Rooms were created with running water and electricity. There was also a hospital (see page 34). These tunnels were used for safety and to allow troops to the front in secrecy	**Cambrai** The Battle of Cambrai took place in October 1917 During this battle over 450 large-scale tanks were used by the Allies to launch a surprise assault on the German front line. Unfortunately, the tanks did not have enough infantry support. The British lost the ground they had taken

The trench system

The **trenches** dug in 1914 developed into an effective defensive network from 1915. The trenches were about 2.5 metres deep. They were dug in a zig-zag pattern and contained dugouts for men to take protective cover in when needed.

The front line	The trench nearest the enemy where the soldiers would shoot from
The command trench	10–20 metres behind the firing line
The support trench	200–500 metres behind the front line
The reserve trench	At least 100 metres behind the support trench. Reserve troops would be here ready to mount a counterattack if the enemy entered the front line
The communication trench	Linked the front line with the command, support and reserve trenches

Key terms

No Man's Land The land between the Allied and German trenches in the First World War

Trenches Long, narrow ditches dug during the First World War in which soldiers fought

Ypres Salient An area around Ypres in Belgium where many of the battles took place in the First World War