

Activity ?

Create a six-picture storyboard to show how Edward Jenner developed the smallpox vaccine.

The impact of the smallpox vaccine

Short term

In the short term, the smallpox vaccine saved many lives. It quickly became very popular overseas and by 1800, 100,000 people around the world had been vaccinated. The French commander Napoleon had his entire army vaccinated in 1805.

The vaccination was slower to become popular in Britain, thanks to the anti-Jenner propaganda promoted by inoculators. Sometimes people still contracted smallpox or died of infection, because the doctors carrying out the procedure mixed up smallpox and cowpox samples or reused needles, and this discouraged people as well. However, after the Royal Jennerian Society had been founded in 1803, 12,000 British people were vaccinated in the space of two years.

Source G

This cartoon was drawn by Cruikshank in 1812. It is titled, 'The cowpox tragedy: scene the last'. The year before, people vaccinated with cowpox had developed smallpox, because of an error with the samples used.



Long term

By the end of the 19th century, vaccination against smallpox had become normal. Opposition continued throughout the century, but the number of people saved made it clear that the method worked. The number of smallpox cases fell dramatically from 1872, when the government started to enforce compulsory vaccinations – this meant that everyone had to be vaccinated for smallpox.

Extend your knowledge

Smallpox today

In the very long term, it could be argued that Jenner was responsible for the end of smallpox. In 1979, The World Health Organisation announced that the disease had been completely wiped out. This would not have been possible without Jenner's early work.

Jenner had shown that a vaccine could be used to stop smallpox from spreading. His work inspired other scientists, like Pasteur and Koch, to search for vaccinations for other diseases. However, there were no other vaccinations discovered that worked in the same way as the smallpox vaccine. This was a one-off, so scientists were unable to develop other vaccines based on Jenner's method.

Exam-style question, Section B

Explain why there was rapid change in the prevention of smallpox after 1798.

You may use the following information in your answer:

- inoculation
- the government.

You **must** also use information of your own.

12 marks

Exam tip

As well as explaining medical breakthroughs in your answer, in order to show what changed you should compare with the situation before Jenner's research.

New approaches to prevention: the development and use of vaccinations

People still generally believed that the best way to avoid dying from a disease was not catching it at all. People had begun to have new ideas about cures – however, most of these were still not effective on patients who were suffering from a disease. Therefore, scientists continued to focus on prevention and developed the idea of the **vaccination**.

Pasteur presented his case for the germ theory of infection in 1878, after publishing his Germ Theory in 1861. He theorised that microorganisms were responsible for disease. He admired the work of Jenner and started to look for vaccines that would tackle lots of diseases. However, Jenner's work had been the result of observations and experiments, rather than tackling the specific microbe. It would not be possible for other vaccines to work the same way. Pasteur realised that vaccines could only be developed once the germs causing that specific disease had been identified.

Pasteur's first effort at a vaccine was for **chicken cholera**. He identified the germ causing the disease and set about developing a vaccination against it.

In 1879 Pasteur proved that a weakened strain of the disease worked to vaccinate the chickens. He continued with his work, also creating a vaccine for anthrax, another devastating disease affecting animals. He then developed a vaccine for rabies.

Pasteur's work on vaccines involved producing a weakened version of the culture and then treating patients with it. This created an **immune response**, where the body fought off the weakened disease and, in doing so, created antibodies* that prevented the individual from suffering from that disease if the microorganism was encountered again. Pasteur did not know that this was why the vaccine worked, because science had not progressed far enough for him to investigate the method properly yet. However, his methods were clearly effective.

Key term

Antibodies*

Particles inside the body that identify and help to remove germs. The body creates them when first encounters the germ, so that it can fight off the same disease more easily if it comes back.

Until this point, Pasteur's focus had been on animal diseases that caused problems for farmers. His work on vaccinations had little direct impact on disease in humans. However, it inspired research among other scientists, who wanted to find other vaccines for a wide range of human diseases.

Koch's work isolating the microbes that caused specific diseases (see page 71) was very important in developing new vaccines. For example, in 1890, Emil von Behring developed a vaccine against tetanus and diphtheria.

By 1900, scientists all over the world were busy isolating microbes and developing vaccines, thanks to the work of Pasteur and Koch. This was a significant breakthrough in the **prevention** of disease.

Activities ?

- 1 Draw a storyboard to explain how vaccines were developed.
- 2 As a method of prevention, vaccines were more effective than anything that had been tried in previous centuries. What factors made the development of new vaccinations possible?

The Public Health Act, 1875

Alongside the new scientific methods of prevention, a great deal was also being done to improve living conditions in Britain, particularly in the larger cities. In c.1700, the government had little interest in improving conditions in cities. They had a *laissez-faire** attitude and believed that it was not their responsibility or right to interfere in the way that people lived.

Key word

Laissez-faire*

This French term means 'leave be'. It is used to describe governments who do not get involved in the day-to-day lives of their population.