

## Case study – Jenner and the development of the vaccination

### Smallpox in 18th-century Britain

At the start of this period, smallpox was a terrible threat to the health of the population of Britain. There were nationwide epidemics in 1722, 1723 and 1740–42. The problem was particularly bad in London, where there were 11 epidemics in the 18th century. The worst of these occurred in 1796, when 3,548 people died. By this time, the population of the city was approaching one million, so the disease spread quickly and easily from person to person.

At this time, people were still unaware of the cause of the disease, but they did have some ideas about how to avoid catching it. It had been noticed that people who caught a mild form of smallpox and then recovered from it did not catch it again. This would later form the basis for vaccination, which works in the same way. However, in the 18th century there was not enough scientific knowledge for people to understand how this worked.

Therefore, some people attempted to inoculate\* themselves against smallpox by catching a mild dose of the disease, so that they would avoid catching a more severe form of it later on. Pus from a smallpox scab would be rubbed into a cut on the patient being inoculated by a doctor. Unfortunately, this did not always work: some patients died of the smallpox they were given, as the disease did not affect everyone in the same way.

#### Key term

##### Inoculate\*

Deliberately infecting oneself with a disease, in order to avoid a more severe case of it later on.

In spite of this, inoculation was seen by many as the best chance of surviving smallpox. However, the procedure was very expensive and so only the very rich could afford it. Many doctors made a fortune carrying out inoculations for wealthy people. One doctor, Thomas Dimsdale, was made a baron, paid £10,000 and awarded an annual salary of £500 after he inoculated Catherine the Great and her children in 1768. He was one of the most successful **inoculators** of his time.

## Jenner discovers the vaccination for smallpox

Edward Jenner was a Gloucestershire doctor in the late 18th century. He had trained as an apprentice to a surgeon-apothecary and then practised medicine at St George's Hospital in London, before returning to Gloucestershire, where he became a general practitioner (GP). Jenner was particularly interested in inoculations. He gathered evidence of over 1,000 cases where smallpox inoculation had failed.

There were a lot of dairy farms in the area where Jenner worked. He regularly treated dairy maids for cowpox\* and noticed that, when there was a smallpox epidemic, those who had previously suffered from cowpox did not catch smallpox. He decided the two must be somehow connected.

#### Key term

##### Cowpox\*

A disease causing red blisters on the skin, similar to smallpox. It can be transmitted from cows to humans.

Jenner needed to test his theory and so, in 1796, he infected a local boy, James Phipps, with cowpox. Six weeks later he attempted to infect James with smallpox, but James did not catch it. Jenner infected more local people with cowpox to further test his theory. In 1798, he wrote up his findings in *An Enquiry into the Causes and Effects of the Variola Vaccinae*. He named the technique 'vaccination' after the Latin word for cow, *vaccā*.

Jenner made sure that the instructions for his new method were very detailed, so that other doctors would be able to follow them. He wanted other people to use the vaccination to prevent smallpox from spreading.

## Reactions to the new vaccination

As with so many medical discoveries, it took some time for people to accept vaccinations. Although Jenner knew that the system worked, he was not able to explain how or why it worked – and this made people suspicious. The idea of infecting someone with an animal disease was seen as extremely strange, and a lot of people were against it.

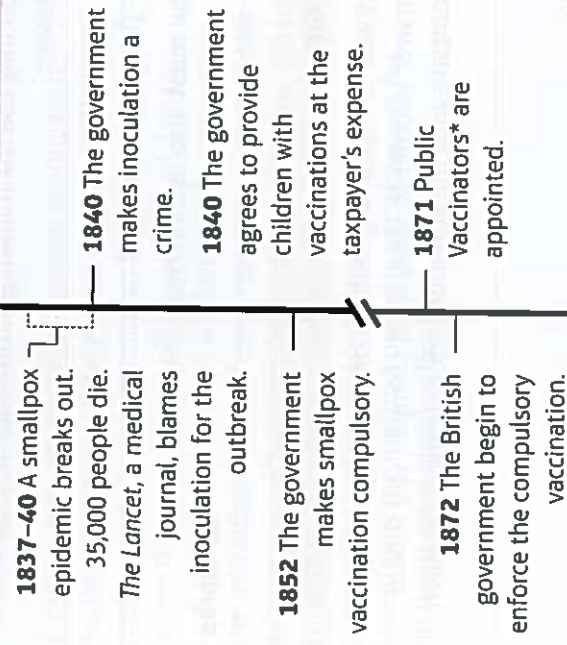


**Figure 3.8** Differing opinions about vaccinations in the 19th century.

Although certain groups of people were against vaccinations, there was another, very powerful group that were in favour of them: parliament. As you can see from the timeline below, the British government favoured the new method of vaccination from the first half of the 19th century. This was because it was a safer and more reliable alternative to inoculation. It was also cheaper, because recipients of vaccines did not need to be put into quarantine, whereas those receiving the inoculation were in danger of spreading smallpox to other people.

#### Timeline

### Smallpox and government intervention, 1840–72



#### Key term

##### Public Vaccinators\*

Doctors paid by the government to vaccinate people against smallpox.

#### Key individual: Edward Jenner

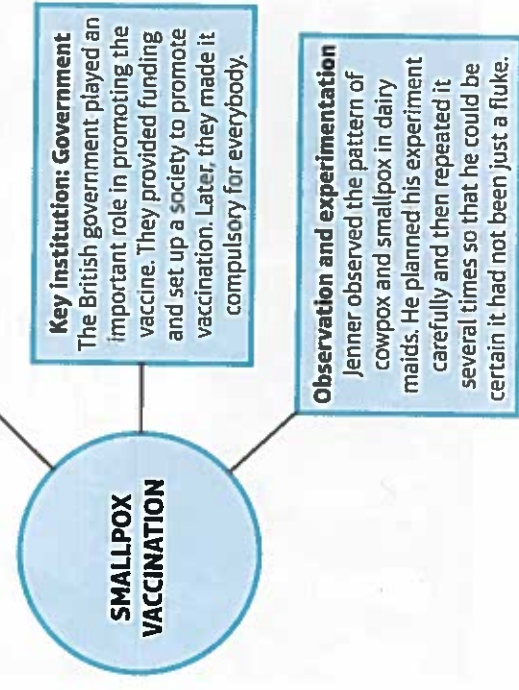
Jenner was a trained doctor who had worked as a surgeon and apothecary as well as in a hospital. He used careful scientific method to test and prove his vaccination.

#### Key institution: Government

The British government played an important role in promoting the vaccine. They provided funding and set up a society to promote vaccination. Later, they made it compulsory for everybody.

#### Observation and experimentation

Jenner observed the pattern of cowpox and smallpox in dairy maids. He planned his experiment carefully and then repeated it several times so that he could be certain it had not been just a fluke.



**Figure 3.9** Factors assisting Jenner in developing the smallpox vaccine.