The history of smallpox is a success story for "modern" medicine and public health. Even though the disease has been eradicated, the threat of its return has once again brought it to the forefront of public controversy.

The origin of smallpox is uncertain, but it is believed to have originated in Africa and then spread to India and China thousands of years ago. The first recorded smallpox epidemic was in 1350 BC during the Egyptian-Hittite war. Smallpox reached Europe between the 5th and 7th centuries and was present in major European cities by the 18th century. Epidemics occurred in the North American colonies in the 17th and 18th centuries. At one time smallpox was a significant disease in every country throughout the world except Australia and a few isolated islands. Millions of people died in Europe and Mexico as a result of widespread smallpox epidemics.

The fall of smallpox began with the realization that survivors of the disease were immune for the rest of their lives. This led to the practice of variolation - a process of exposing a healthy person to infected material from a person with smallpox in the hopes of producing a mild disease that provided immunity from further infection. The first written account of variolation describes a Buddhist nun practicing around 1022 to 1063 AD. She would grind up scabs taken from a person infected with smallpox into a powder, and then blow it into the nostrils of a non-immune person. By the 1700's, this method of variolation was common practice in China, India, and Turkey. In the late 1700's European physicians used this and other methods of variolation, but reported "devastating" results in some cases. Overall, 2% to 3% of people who were variolated died of smallpox, but this practice decreased the total number of smallpox fatalities by 10-fold.

The next step towards the eradication of smallpox occurred with the observation by English physician, Edward Jenner, that milkmaids who developed cowpox, a less serious disease, did not develop the deadly smallpox. In 1796, Jenner took the fluid from a cowpox pustule on a dairymaid's hand and inoculated an 8-year-old boy. Six weeks later, he exposed the boy to smallpox, and the boy did not develop any symptoms. Jenner coined the term "vaccine" from the word "vaca" which means "cow."
in Latin. His work was initially criticized, but soon was rapidly accepted and adopted. By 1800 about 100,000 people had been vaccinated worldwide.

The "modern" vaccine that was licensed by the FDA was taken from a weak strain of virus called the New York City Board of Health strain. It was produced by Wyeth Laboratories and licensed under the name Dryvax. The last outbreak of smallpox in the United States occurred in Texas in 1949 with 8 cases and 1 death. Even though most of North America, Western Europe, Australia, and New Zealand were free of smallpox by this time, other countries such as Africa and India continued to suffer from epidemics.

In 1967 the World Health Organization (WHO) started a worldwide campaign to eradicate smallpox. This goal was accomplished in 10 years due in a large part to massive vaccination efforts. The last endemic case of smallpox occurred in Somalia in 1977. On May 8, 1980, the World Health Assembly declared the world free of smallpox.

The United States stopped vaccinating the general population in 1972, but continued to vaccinate military personnel. It was recommended that vaccination of military personnel stop in 1986, and vaccination was officially stopped in military recruits in 1990.

Information for this article was taken from

World Health Assembly votes not to destroy smallpox virus

New York Janice Hopkins Tanne
The world’s two remaining stocks of smallpox virus, kept in Russia and in the United States, should not be destroyed just yet, the World Health Assembly decided last week at its meeting in Geneva. Scientists may be allowed to genetically manipulate fragments of the virus to evaluate new drugs and treatments.
Smallpox was eradicated 25 years ago. Because vaccination stopped, many people lack immunity to the virus. Smallpox kills about a quarter to a third of those infected and leaves many survivors scarred or blind.

Both the United States and Russia spoke in favour of keeping the virus and extending the research period, but experts are concerned. Dr Georges Benjamin, head of the American Public Health Association, said, "This is a disease that doesn’t exist anywhere in the world. Nobody would want it to get out of the lab accidentally. The only rational reason [to do research] is if there’s a re-emergence of the disease … It would take a lot to convince me that it’s a good thing to do research and keep the virus." Dr Benjamin said he thought the chance that there was smallpox virus outside the two repositories was "not zero, but low."

However, Dr John Deutch, former director of the US Central Intelligence Agency and now a professor at the Massachusetts Institute of Technology, said, as he recently told a Senate subcommittee, that everyone in the United States should be vaccinated against smallpox "because of the threat of a bioterrorist attack … There’s a reasonable chance that smallpox virus is out there, uncontrolled."

A national vaccination programme in the US aimed at healthcare workers and "first responders" began in 2003, but concern over side effects slowed the project (BMJ 2004;328:1220).

WHO will stockpile smallpox vaccine in Geneva for use in an emergency. About 2.5 million doses are stored, and another 31 million doses have been donated, including 20 million from the United States and five million from France. Reuters reported a rise in shares of Acambis and Bavarian Nordic, who may make additional doses of vaccine for the US Department of Health and Human Services. The US has enough vaccine to protect its citizens, Dr Benjamin said.

Proposed testing of the virus may use a common microbiological test that inserts a gene into the virus causing green fluorescence. If the virus is exposed to a drug but the drug is ineffective the virus remains alive and glows green. If the drug kills the virus, the virus does not glow green.

The Sunshine Project, a non-governmental organisation concerned with issues relating to biological weapons (www.sunshine-project.org), said that many scientists oppose the "green gene" experiment and other experiments using the smallpox virus and any relaxation of restrictions on distribution of smallpox virus DNA to other laboratories.

BMJ 2005;330(7502):1230 (28 May)