
Smallpox

Summary

- Smallpox was once a feared viral disease, common in all countries around the world.
 - An aggressive immunisation campaign eradicated smallpox by 1977.
 - There is a small risk that smallpox could be released intentionally as a bioweapon and health departments around the world, including in Victoria, are planning for this possibility.
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Smallpox is caused by the variola virus, an orthopoxvirus. Smallpox was once a feared and highly contagious viral disease that was found in all countries around the world. The main characteristic of the disease was a rash of blisters or pustules on the skin, which eventually dried up and left permanent scars.

Smallpox can be deadly if the virus attacks the circulatory system, bone marrow or respiratory system. As recently as the 1960s, around 12 million people caught this highly contagious disease and approximately two million people died every year.

The World Health Organization (WHO) mounted an aggressive worldwide campaign of immunisation and by 1977, the last naturally occurring case was detected in Somalia. Eradication was certified by a commission of scientists in 1979 and endorsed by the World Health Assembly the following year. Small stocks of smallpox virus remain in two designated international laboratories.

Vaccination against smallpox is not recommended in Australia and is not on the National Immunisation Program Schedule.

Symptoms of smallpox

The smallpox virus incubates inside the body for between seven and 17 days, usually for 12 days.

Symptoms include:

- fever
- headache
- muscular aches and pain, particularly in the back
- a non-specific red rash on the face, body and limbs
- feeling unwell and likely to be confined to bed
- the rash develops into small blisters or pustules. The pustules split, dry and scab, then the scabs fall off, leaving scars.

Death can result if the virus attacks the circulatory system, bone marrow or respiratory system.

Smallpox and vaccination

Smallpox has played an important role in the development of vaccination.

Since ancient times, it was common knowledge that an infection with smallpox conferred lifelong immunity. An 18th century doctor, Edward Jenner, first discovered the key to immunising people against smallpox. He noticed that milkmaids hardly ever fell victim to the disease, and hypothesised that their prior infection with the relatively

harmless disease known as 'cowpox' may have protected them.

Jenner tested his theory by deliberately infecting a boy with cowpox, harvested from the pus of a milkmaid's skin pustule. Jenner then exposed the boy repeatedly to the smallpox virus, but the boy didn't catch the disease.

The word 'vaccination' recognises Jenner's discovery, since 'vacca' is Latin for cow. However, Jenner and his contemporaries still didn't understand the underlying mechanisms of vaccination, as bacteria and viruses hadn't yet been discovered.

Using a similar technique to that used by Jenner, researchers devised an effective smallpox vaccine based on a similar virus, called the vaccinia virus. Different formulations of this vaccine were used until the 1970s.

In 1967, the World Health Organisation mounted a major campaign to eradicate smallpox. Within 12 years, smallpox disease was eradicated.

Stores of smallpox and future vaccination

The only remaining smallpox viruses are contained in two WHO collaborating centres: the Centers for Disease Control, Atlanta, USA, and the Laboratory for Applied Microbiology at Koltsovo in the Novosibirsk region of the Russian Federation.

Smallpox has recently been assessed as a possible biological weapon that could be used in non-conventional warfare or in a terrorist attack. Although this is believed to be unlikely, planning for such an eventuality has commenced worldwide. In Australia, a small amount of smallpox vaccine is available for essential medical personnel and contacts in the case of an outbreak.

Immunisation programs

Immunisation has saved more lives this century than any other medical discovery, including antibiotics. Many infectious diseases have been contained by immunisation programs. For instance, cases of invasive haemophilus influenzae b (Hib disease) in Victoria have declined by more than 90 per cent since vaccination was introduced in 1993. Immunisation programs are one of the cheapest and most effective preventative measures against many infectious diseases.

Immunisation and HALO

The immunisations you may need are decided by your health, age, lifestyle and occupation. Together, these factors are referred to as HALO.

HALO is defined as:

- **Health** – some health conditions or factors may make you more vulnerable to vaccine-preventable diseases. For example, premature birth, asthma, diabetes, heart, lung, spleen or kidney conditions, Down syndrome and HIV will mean you may benefit from additional or more frequent immunisations.
- **Age** – at different ages you need protection from different vaccine-preventable diseases. Australia's National Immunisation Program sets out recommended immunisations for babies, children, older people and other people at risk, such as Aboriginal and Torres Strait Islanders. Most recommended vaccines are available at no cost to these groups.
- **Lifestyle** – lifestyle choices can have an impact on your immunisation needs. Travelling overseas to certain locations, planning a family, sexual activity, smoking, and playing contact sport that may expose you directly to someone else's blood, will mean you may benefit from additional or more frequent immunisations.
- **Occupation** – you are likely to require additional or more frequent immunisations if you work in an occupation that exposes you to vaccine-preventable diseases or puts you into contact with people who are more susceptible to problems from vaccine-preventable diseases such as babies or young children, pregnant

women, the elderly, and people with chronic or acute health conditions. Workers in aged care, childcare, healthcare, emergency service or sewerage repair and maintenance need to discuss their immunisation needs with their doctor. Some employers help with the cost of relevant vaccinations for their employees.

View the [HALO graphic \(PDF\) to find out more.](#)

Where to get help

- Your doctor

Things to remember

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This page has been produced in consultation with and approved by:

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