



Smallpox: Fact vs. Fiction

Over the years, the writers of fictional film and television programs and movies have chosen disease outbreaks as the central theme of their storylines. The screening of F/X network's movie *Smallpox* and the May 2002 *ER* finale are examples of this type of outbreak story, specific to smallpox.

Telling this type of story in film or on television creates challenges for the writers and for audiences. Because of the immediacy of the film medium, scientific and medical facts have to be dramatized, leaving the audience with some very real misconceptions and questions about how smallpox spreads and the nature of this health threat.

This site addresses some of the most noticeable misconceptions you might derive from fictional programs about smallpox. You will also find links to more detailed CDC information about smallpox.

INCUBATION PERIOD OF THE SMALLPOX VIRUS

Fiction:

Movies and television often show people developing symptoms of smallpox right after exposure to someone who is contagious.

Fact:

Exposure to the virus is followed by an incubation period during which people do not have any symptoms and may feel fine. The asymptomatic incubation period for smallpox disease averages about 12 to 14 days but can range from 7 to 17 days. During this time, people cannot pass the infection to other individuals. For more information about the incubation period of the smallpox virus, see <http://www.bt.cdc.gov/agent/smallpox/overview/disease-facts.asp>.

INFECTIOUSNESS

Fiction:

In movies and television programs, a single infectious person may be shown infecting many people. In the movie *Smallpox*, the terrorist infected approximately 20 other people, who then infected twenty others, and so on, so that the subsequent infection rate was too great to contain.

Fact:

Smallpox is a contagious disease, but it is not generally as highly contagious as movies may depict. Historically, in smallpox outbreaks that occurred before naturally occurring smallpox was eradicated in 1980, each infectious person typically infected susceptible close or household contacts, but not casual or brief contacts. It is difficult to estimate possible transmission rates of smallpox infection which could occur today because of many factors which have changed over the past 25 years. However, there is some agreement amongst experts that each infectious person could infect 5-6 others. Nonetheless, measles, influenza, and whooping cough are each more contagious than smallpox.

The rate of transmission portrayed in the movie is on the extreme end and would greatly increase the number of people infected and the speed with which great numbers of people would be infected. In the movie, one person infected 20 people, who then infected 20 others, and so on. In a case such as this, the numbers of infected people would increase quite rapidly, so that by, for example, the fifth generation of cases of disease, 3,200,000 people would be infected. Whereas, in the model which CDC and others believe to be a more accurate estimate, in which 1 person

infected approximately 5 others, and so on, by the fifth generation, 3,125 people would be infected. While all deaths from such an illness would be a tragedy, the slower infection rate would make it much easier for public health officials to contain, and ultimately stop, an outbreak.

Regardless, efforts to contain the spread of smallpox would begin as soon as the first case was detected. The long asymptomatic (and non-contagious) incubation period permits easier containment of the spread of infection. Contacts of cases can be identified, monitored, and/or vaccinated to prevent the spread of infection. Even one case of smallpox would be considered a public health emergency. CDC and other experts believe that the technique our public health service will use to identify and contain the spread of the disease would be effective in stemming the disease. This method is commonly called **ring vaccination**. This method was used worldwide in 1967 to help eradicate smallpox disease. By 1980, these efforts had succeeded, and smallpox was eradicated worldwide. Ring vaccination involves finding people who were exposed to an infected person. Then, the exposed person and those people he or she had been in contact with are given the vaccine. That is, the smallpox vaccine is given to those people who had been, or could have been, exposed to an infected person. This approach creates a "ring" of vaccinated people around the people who were infected with smallpox and stops the spread of the disease. In the end, it was this strategy of "ring vaccination" that completely got rid of the disease.

TRANSMISSION

Fiction:

Fictional accounts, like that in F/X's movie *Smallpox*, show people becoming infected by walking into a space that a contagious person occupied 5-6 hours earlier. People with smallpox are depicted as capable of infecting other people by bumping into them or touching them briefly.

Fact:

Generally, direct (within 6-7 feet) and fairly prolonged (approximately 3 hours) face-to-face contact is required to spread smallpox from one person to another. Historically, close, intimate, or household contacts of symptomatic (with rash) smallpox patients were most susceptible to infection. For more information about the transmission of smallpox, see <http://www.bt.cdc.gov/agent/smallpox/overview/disease-facts.asp>.

VACCINATION

Fiction:

It's not always clear in movies and television programs about smallpox exactly when people need to be vaccinated in order to be protected from smallpox disease if they have been exposed to someone who is contagious.

Fact:

Vaccination within 3 days of exposure will completely prevent or significantly modify smallpox in the vast majority of people. Vaccination 4 to 7 days after exposure likely offers some protection from disease or may modify the severity of disease. For more information about smallpox vaccination, see <http://www.bt.cdc.gov/agent/smallpox/vaccination/faq.asp>.

SIGNS AND SYMPTOMS OF SMALLPOX DISEASE

Fiction:

In the F/X movie *Smallpox*, we see a police composite sketch of a supposed terrorist who is infecting people with smallpox, yet he has no visible rash. Later in the movie, video tapes of the terrorist don't show any other noticeable symptoms of smallpox disease. Could someone spread smallpox without appearing to be sick?

Fact:

Studies have shown that individuals with smallpox can infect others, or are most contagious when the rash appears. Some virus can be found in saliva after the onset of fever and before the rash onset, so it is possible that a person with smallpox could be contagious before a rash appears, but the person would by then be quite symptomatic: suffering from fever and likely severe flu-like symptoms of bodyaches and headache. This period of time may last, on average, a couple of days.

During the stage of the illness where he/she would be contagious, a terrorist would have noticeable symptoms of disease--including a rash, high fever, malaise, headaches, body aches, and vomiting. Even before the onset of rash, most people, once they start developing symptoms, are too sick to walk, or even stand. For this reason, it is highly unlikely that a terrorist or other contagious person would be well enough to be able to move around unnoticed throughout a city while attempting to infect others. Even if they were physically able to walk around, their symptoms would make them very conspicuous to those around them. For more information about the signs, symptoms, and stages of smallpox disease, see <http://www.bt.cdc.gov/agent/smallpox/overview/disease-facts.asp>.

ISOLATION OF SMALLPOX CASES AND CONTACTS AND VACCINE SUPPLY**Fiction:**

Movies and television shows about smallpox have shown public fear and panic caused by people trying to get a smallpox vaccine when supplies are limited. Some fictionalized programs have shown armed military staff controlling crowds or enforcing quarantine.

Facts about Vaccine Supply:

After the events of September and October, 2001, the U.S. government took actions to improve its level of preparedness against terrorism. One of many such measures—designed specifically to prepare for an intentional release of the smallpox virus—included updating and releasing a [smallpox response plan](#). Right now, the U.S. government has enough smallpox vaccine to vaccinate every person in the United States in the case of a smallpox emergency. For more information about smallpox vaccine supply, see <http://www.bt.cdc.gov/agent/smallpox/vaccination/facts.asp> and <http://www.bt.cdc.gov/agent/smallpox/prep/cdc-prep.asp>.

Facts about Isolation and Vaccination Strategy:***How Public Health Officials will Respond to a Smallpox Outbreak***

CDC has a detailed plan to protect Americans against the use of smallpox as a biological weapon. This plan includes the creation and use of special teams of health care and public health workers. If a smallpox case is found, these teams will take steps immediately to control the spread of the disease. Smallpox was wiped out through specific public health actions, including vaccination, and these actions will be used again.

- If a smallpox outbreak happens, public health officials will use television, radio, newspapers, the Internet and other channels to inform members of the public about what to do to protect themselves and their families.
- Officials will tell people where to go for care if they think they have smallpox.
- Smallpox patients will be isolated (kept away from other people who could get sick from them) and will receive the best medical care possible. Isolation prevents the virus from spreading to others.
- Anyone who has had contact with a smallpox patient will be offered smallpox vaccination as soon as possible. Then, the people who have had contact with those individuals will also be vaccinated. Following vaccination, these people will need to watch for any signs of smallpox. People who have been exposed to smallpox may be asked to take their temperatures regularly and report the results to their health department.

- The smallpox vaccine may also be offered to those who have not been exposed, but would like to be vaccinated. At local clinics, the risks and benefits of the vaccine will be explained and professionals will be available to answer questions.
- No one will be forced to be vaccinated, even if they have been exposed to smallpox.
- To prevent smallpox from spreading, anyone who has been in contact with a person with smallpox but who decides not to get the vaccine may need to be isolated for at least 18 days. During this time, they will be checked for symptoms of smallpox.
- People placed in isolation will not be able to go to work. Steps will be taken to care for their everyday needs (e.g., food and other needs).

For more information about what CDC will do in the case of a real smallpox outbreak, see <http://www.bt.cdc.gov/agent/smallpox/basics/outbreak.asp>.

For more information, visit www.cdc.gov/smallpox, or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).
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