

# The smallpox vaccine and beyond

*Smallpox is not the only biological threat*

BY PEGGY C. WILDS

**T**he war against the smallpox virus, a potential biological weapon, officially began last December 13th when the federal government began vaccinating military personnel against the deadly virus. President Bush said that as commander in chief he would be vaccinated and ordered nearly half a million people in the armed forces inoculated. He encouraged as many as 10 million health care workers and emergency responders to quickly follow his example.

The vaccine will be made available to the general public, but is not recommended.

Bush's decision to make the vaccine available to all 286 million Americans alarmed some health and bioterrorism

experts who fear it will result in unnecessary medical complications and could divert resources from urgent national security needs. "The smallpox vaccine is decades old and is not harmless," said Dr. John O'Bannon III, a practicing neurologist and member of the House of Delegates in Virginia "We wouldn't approve it in today's climate."

Others fear that the heightened focus on smallpox could undermine the need for public health systems to protect the public from all potential biological, chemical and radiological weapons of terrorism. Mary Selecky, secretary of health for the state of Washington, believes that protecting the public is fundamentally about a solid foundation for the public health system, not just about smallpox. "The foundation is built on protection, prevention, and intervention for all communicable diseases," she said.

## The disease and the vaccine

Smallpox is a deadly disease caused by a virus. Symptoms of the disease are prolonged fever, vomiting, and eruptions of pus on the skin that leave pockmarks. It is spread most often by infected persons releasing saliva from their mouths into the air. A susceptible person in close contact with the ill then inhales the droplets. Contamination is also possible through bed linens and clothing. Smallpox kills about three out of 10 people who contract it. The last case of it in the United States was in 1949, and routine vaccination ended in 1972. Thus, about 45 percent of the public is totally unprotected.

The vaccine is made with a live virus called vaccinia, and that raises concerns about side effects that can be severe. Based



*Dr. John O'Bannon III,  
Virginia House Delegate*

on pre-1970s data, health experts estimate that 15 out of every million people vaccinated for the first time will face life-threatening complications, and one or two will die. Most deadly is encephalitis, or brain swelling, which can cause paralysis, permanent neurological damage and death. Persons at greatest risk for complications from the vaccination are those with weak immune systems caused by HIV, cancer therapy and transplants, and who have certain skin conditions such as eczema.

Some say that the risk of the vaccine is higher than the risk of having a case of smallpox. "Everyone must be fully informed before consenting to be vaccinated," said O'Bannon.

Then there is the problem of liability. According to a *Washington Post* article, the Service Employers International Union, the nation's largest union of health care workers, has attacked an 11th-hour provision in the Homeland



*Mary Selecky,  
Washington state secretary of health*

Security Act that grants liability protection to vaccine makers and people who administer it but offers no direct compensation for persons who suffer complications from the vaccine.

**Beyond smallpox**

The events of Sept. 11, the anthrax attacks, and other terrorist activities have brought the United States to a heightened level of awareness with an increased emphasis on public health. The public must have a solid working knowledge of the national, state and local plans for responding to a bioterroristic event.

By last December, 49 states and four cities had submitted a plan to the Centers for Disease Control and Prevention that detailed how public health and hospital workers would be vaccinated to prepare for a smallpox attack. At that time there was no new information regarding the level of threat. The CDC reports, however, that the use of the smallpox virus as a weapon of bioterror is a valid possibility, although no one knows when and if it will happen.

Smallpox is not the only bioterror agent that poses a threat to public health.

Richard Greenberg, a professor in the division of infectious diseases at the University of Kentucky and head of clinical smallpox trials there for the U.S. military, said that while smallpox is known as the “king of bioterrorism,” “Major havoc could be created by other agents that are deadly threats. Some experts are more concerned about anthrax than smallpox.”

The CDC has compiled a hit list of Class A biological agents that not only includes smallpox but also anthrax, botulism toxin, plague, smallpox, tularemia,

**Smallpox side effects**

- Accidental transfer of virus to other parts of the body.
- Vaccinia rash.
- Eczema vaccinatum. (Usually mild but can be severe.)
- Progressive vaccinia. (Frequently fatal for immune-suppressed people.)
- Encephalitis, or brain swelling. (Occurs at a rate of 12.3 per million for first-time recipients. 5 percent to 25 percent will die and another 25 will have permanent neurological damage.)

*Source: University of Minnesota, Center for Infectious Disease Research and Policy*

and viral hemorrhagic fevers such as Ebola. Anthrax, plague and tularemia are caused by bacteria that can be destroyed by antibiotics. However, overuse and misuse of these antibiotics have led to mutated bugs that resist those that were effective against them just a few years ago. Smallpox and viral hemorrhagic fevers are caused by viruses that antibiotics cannot kill. Only vaccines and a limited number of antiviral drugs are weapons against viruses.

**Who pays?**

Bush’s war on smallpox may have added more funding pressures on states as they prepare to respond to bioterrorism. The U.S. Department of Health and Human Services made available more than \$1.1 million dollars in grants to states to build a public health system capable of responding to bioterror events. But none of that money was earmarked for distributing the smallpox vaccine, according to State Sen. Richard Moore of Massachusetts, chairman of the legislature’s joint committee on health care.

“My understanding is that the federal government has not made any additional funds available for implementation of the smallpox vaccine plan,” he said. “Instead, they have said that states should use funds previously distributed for terrorism response

planning and infrastructure and redirect that money to the smallpox program.”

While the federal government has promised funds to help states battle bioterrorism, O’Bannon said, “I have not yet seen sufficient funds from the federal government, and I am guardedly optimistic about securing the funds. Yet the state of Virginia is prepared to do what we have to do.” Assemblyman Samuel Thompson from New Jersey agrees. “In New Jersey we will do whatever is necessary to combat bioterrorism or any type of terrorism,” said Thompson. “Despite our projected \$4 billion deficit, we will find solutions.”

**What can policy-makers do?**

Mary Selecky, secretary of health for the state of Washington, believes public health systems in the United States are more informed and better prepared than before Sept. 11. “We’ve learned a lot, but it’s not enough,” she said. She suggests that state policy-makers can strengthen public health systems by:

- focusing on public health, not just smallpox;
- learning more about existing public health laws and revising them for today’s needs;
- knowing how the public health system works and investing more in it as needed; and
- ensuring that state and local health officials have the authority to deal with bioterrorism and communicable diseases.

**Conclusion**

While the government and the public wring their hands over the smallpox scare, this is not the first time the country has faced a public health threat from hostile forces. “It may be like when we were building the fallout shelters in the 1960s,” said State Sen. Tom Buford of Kentucky. “Logistically, too, we’re into a bigger problem than we ever dreamed about and are probably more vulnerable than we would ever want to think about.”



— *Peggy C. Wilds is a health policy analyst with The Council of State Governments.*

**Resources**

For more information on smallpox, visit:

- <http://www.bt.cdc.gov/agent/smallpox>
- <http://www.doh.wa.gov/BioTerr/smallpox.htm>
- <http://www.smallpox.gov/>