

Bioterrorism

When No Place Is Immune, Public Health Agencies Must Prepare

Julie Wicklund Over the course of the twentieth century, the scope of public health practice expanded in step with societal changes, emerging threats to health, and medical and technological advances. As the twenty-first century opens, public health agencies again confront a new and especially difficult challenge — the threat of bioterrorism. Events of the last decade, such as the World Trade Center bombing, the Oklahoma City bombing, and the sarin nerve gas release in the Tokyo subway, have heightened concern about potential terrorist attacks in general and bioterrorist attacks in particular. Bioterrorism is the intentional or threatened use of viruses, bacteria, fungi, or toxins from living organisms to produce death or disease in humans, animals, or plants.

The easy movement of people across borders, global communication networks, and the difficulty of identifying potential terrorists, particularly those operating alone, mean that no place is immune from these frightening acts. Early this year a member of a terrorist group was arrested after entering the United States at Port Angeles, Wash. In the past year or so, local public health leaders in more than a dozen communities across the United States

have had to deal with claims of release of dangerous biological agents.

In response to this emerging issue, Congress authorized the Centers for Disease Control and Prevention (CDC) to coordinate the effort to upgrade national public health capability to counter bioterrorism. Following this mandate, the CDC established the Bioterrorism Preparedness and Response Program to facilitate collaboration, not only within CDC but also with international, state, and local health agencies and with nontraditional public health partners, such as military and law enforcement organizations. Additionally, CDC is working to establish a National Pharmaceutical Stockpile to ensure the ready availability of drugs, vaccines, prophylactic medicines, chemical antidotes, medical supplies, and equipment that might be needed in a medical response to a biological or chemical terrorist incident.

In September 1999, the CDC awarded federal money to state and large metropolitan health departments, including \$1 million to the Washington State Department of Health (DOH), to respond to the threat of bioterrorism. DOH received funding to upgrade public health infrastructure in three areas: epidemiology and surveillance, laboratory support, and health alert network and training. Specifically this funding will be used to:

- reinforce and enhance public health surveillance to detect unusual or covert events;
- build epidemiologic capacity to investigate and control health threats from such events;
- enhance public health laboratory capacity to manage specimens submitted for testing or to confirm biological agents possibly associated with bioterrorism;
- develop and coordinate rapid and secure electronic communications systems with other government agencies and the general public to disseminate critical information; and
- coordinate distance learning opportunities

Anthrax: A Potential Bioterrorist Agent

Anthrax, caused by a spore-forming bacterium, *Bacillus anthracis*, is a naturally occurring disease that is acquired through contact with infected animals or animal products.

Transmission: by cutaneous contact, eating undercooked, infected meat, or through inhalation of aerosolized spores. Inhalation anthrax will be the most likely consequence of an intentional (bioterrorist) exposure.

Symptoms: usually develop within 1–5 days; initial symptoms of inhalation anthrax resemble those of influenza (low-grade fever, nonproductive cough, malaise, fatigue); if untreated, symptoms progress after several days to severe respiratory distress, shock, and death.

Treatment: Antibiotic prophylaxis should be initiated when exposure to aerosolized anthrax spores is suspected. Prophylaxis should continue for at least 30 days (and possibly up to 60 days) if the exposure is confirmed.

to provide bioterrorism preparedness information to local health jurisdictions (LHJ).

A state coordinator, along with coordinators working in Public Health Seattle & King County and the Spokane Regional Health District, will develop materials to assist other LHJs with local surveillance and preparedness efforts.

In contrast to an obvious terrorist attack such as a bomb, or the release of nuclear or chemical agents, the initial detection of an unannounced release of a biological agent would rely on both the diagnostic capabilities of health care providers and clinical laboratorians, and the ability of public health surveillance to detect unusual patterns of disease. Early recognition of an event may be critical to minimizing its impact, especially if prophylaxis can be administered to others exposed or if the illness can be spread person-to-person.

Health care providers and public health officials need to be aware of the threat of bioterrorism and be familiar with the classes of agents used or potentially used in biological weapons and their symptom profiles. The CDC has listed several potential agents of particular concern including *Bacillus anthracis* (anthrax), smallpox virus, *Yersinia pestis* (plague), *Clostridium botulinum* toxin, and *Francisella tularensis* (tularemia). Many of these agents have nonspecific presenting symptoms (influenza-like prodrome), so it is also important for health care providers to understand the epidemiologic clues of a bioterrorism event. The following situations could represent possible bioterrorism events and should be reported to your LHJ:

- A single diagnosed or strongly suspected case of disease caused by an uncommon agent or a potential bioterrorist agent occurring in a patient with no known risk factors.
- A cluster of patients presenting with a similar syndrome that includes unusual disease characteristics or unusually high morbidity or mortality without obvious etiology.

- An unexplained increase in a common syndrome beyond seasonally expected levels. In addition to partnerships with the medical community, public health officials should enhance interagency coordination and communication with the FBI, police, fire, and emergency management agencies. Public health must work with these groups to integrate bioterrorism preparedness plans with existing emergency management and disaster response plans.

Although the possibility of a bioterrorist attack is remote, the implications of not preparing could be catastrophic. Preparing for bioterrorism will also improve the ability of public health agencies to respond to other naturally occurring biological disasters and emergencies such as an influenza pandemic or large outbreaks of endemic diseases and newly emerging diseases.

Recommended Reading

APIC Bioterrorism Task Force and CDC Hospital Infections Program Bioterrorism Working Group: *Bioterrorism Readiness Plan: A Template for Healthcare Facilities*. Washington, DC: Association of Professionals in Infection Control, 1999.

Bryan JL, Fox Fields H: An ounce of prevention is worth a pound of cure – shoring up the public health infrastructure to respond to bioterrorist attacks. *Am J Infect Control* 1999; 27(6):465–467.

Henderson DA: The looming threat of bioterrorism. *Science* 1999; 283(26):1279–1282.

Henderson DA, Inglesby TV, Bartlett JG, et al: Smallpox as a biological weapon: medical and public health management. *JAMA* 1999; 281(22): 2127–2137.

Inglesby TV, Henderson DA, Bartlett JG, et al: Anthrax as a biological weapon: medical and public health management. *JAMA* 1999; 281(18):1735–1745.

Lillibridge SR, Bell AJ, RS Roman: Centers for Disease Control and Prevention bioterrorism preparedness and response. *Am J Infect Control* 1999; 27(6):4634.

Author

Julie Wicklund, M.P.H., is an epidemiologist in the Communicable Disease Epidemiology Section of the Washington State Department of Health and is the state bioterrorism surveillance coordinator.

Reprinted from

Washington Public Health, Fall 2000

A publication of the University of Washington School of Public Health and Community Medicine Box 354809, Seattle, Washington 98195-4809 (206) 685-2617, Fax (206) 543-9345

On-line Information

The Association of Professionals in Infection Control (APIC), in cooperation with CDC, has created a reference document to raise awareness and facilitate preparation of bioterrorism readiness plans. It includes an overview of infection control activities and disease-specific information on smallpox, anthrax, plague, and botulism. This document is available at <http://www.cdc.gov/ncidod/hip/Bio/13apr99APIC-CDCBioterrorism.pdf>.