

An invisible arsenal

Despite federal preparations, many medical experts say the U.S. health system is ill-equipped to manage the fallout from a large-scale bioterrorist attack. But the threats are clear. Five biological agents have been given high priority because of their risks to national security.

Biological terrorism

Background	How you can get it	Symptoms	Vaccine	Treatment	Other
Anthrax A government study estimated that about 200 pounds of anthrax released upwind of Washington, D.C., could kill up to 3 million people.	Inhaling spores sprayed in the air. It's not contagious.	Usually within 7 days, fever, cough and cold-like symptoms show up. About 85 percent of people die within one to three days.	A vaccine is available only to the military. Fewer than 20 percent of U.S. troops have been vaccinated.	If diagnosed before symptoms appear, anthrax can be treated with antibiotics such as ciprofloxacin, penicillin and doxycycline.	The anthrax bacterium is abundant in soils and has been heavily produced by Iraq and the former Soviet Union. It's attractive to terrorists because it is resistant to heat, cold and wind.
Smallpox It killed more than 500 million people in the 20th century before being eradicated in 1977. Vaccinations stopped in 1980.	Inhalation, and from contact with infected clothing, bedding, fabrics. It's highly contagious between people.	About 10 to 12 days after exposure, high fevers, fatigue, open sores appear. About 30 percent die.	The CDC has about 7.5 million doses available, which isn't considered enough to handle a mild outbreak. A British company is making 40 million doses, with the first batches available later next year.	None. Smallpox patients are quarantined, because each patient can spread the disease to an average of 10 to 20 others.	The only legal stocks are at the CDC in Atlanta and in Russia. But other stocks of virus are known to exist, making vaccine a priority. Considered the most devastating of all biological weapons, because it's contagious.
Botulism The toxin produced by this bacterium is the single most poisonous substance known. Typically foodborne, but could be developed as an aerosol weapon.	Inhalation, eating in contaminated food. Not contagious. Chlorination kills it in water.	Within one to eight days, double vision, stomach pains, paralysis, suffocation, death. Fatigue and shortness of breath can linger for years afterward.	A scarce antidote made from horse serum, which can cause a serious allergic reaction. It is most effective if used after early diagnosis.	Ventilators, supportive care. Exposed skin and clothing should be washed with soap and water. Exposed objects or surfaces should be washed in a bleach solution and avoided for days.	Considered the most toxic substance known. Iraq says it has produced 19,000 liters of the toxin.
Plague Between 1980 and 1994, 18,739 cases of history's most feared contagious disease were reported in 20 countries.	Inhalation of plague bacteria spread in aerosols. It is contagious.	Fever, chest pain, nausea, and severe pneumonia-like symptoms within 1 to 6 days. People die quickly after symptoms appear.	The U.S.-licensed vaccine was discontinued in 1999 and is no longer available. Research is ongoing into a pneumonic-plague vaccine.	Antibiotics, particularly streptomycin, gentamycin and doxycycline, are thought to be effective if given quickly. Limited tests have been done in animals.	Plague caused the "Black Death" in the 14th century, which killed about one-third of the European population. Plague bacteria are more vulnerable to weather than anthrax.
Tularemia The United States studied this infectious organism as a weapon in the 1950s and 1960s.	Inhalation, skin absorption, eating or drinking contaminated food or water. Not contagious, but easily caught.	Within three to five days, fever, vomiting, pneumonia-like symptoms, respiratory failure, shock, death. It is difficult to distinguish from flu.	A vaccine is currently under review by the FDA.	Antibiotics, particularly streptomycin, gentamycin, doxycycline and ciprofloxacin. Skin and clothing must be decontaminated with soap and water.	Tularemia is caused by a hardy bacterium that resists the elements. Antibiotic- and vaccine-resistant strains were developed by the Soviet Union.

Chemical terrorism

Background	Common agents	How you can get it	Symptoms	Vaccine	Treatment	Other
Nerve agents Most agents were developed in the 1930s and 1940s in Germany as insecticides, and later used in sprays as chemical weapons.	Sarin, Tabun, Soman, VX	Inhalation or skin absorption.	Within minutes, wheezing, blurry vision, constricted pupils, foaming at the mouth, convulsions, paralysis, suffocation and death.	None	Wash off immediately with soap and water. Atropine, oximes; must be injected soon after exposure. Assisted ventilation.	Can be transmitted by contact.
Mustard agents Developed in 1820s, were first used as chemical weapons in World War I.	Sulfur Mustard, Nitrogen Mustard, Lewisite	Inhalation or skin absorption.	Within minutes, skin blisters, nausea, blindness, permanent lung damage. Death is rare.	None	Wash off skin with soap and water, and rinse eyes. Antibiotics for secondary infections and pain relievers can also be used. If it is washed off within five minutes, injury can be reduced 50 percent.	

Sources: Centers for Disease Control, Journal of the American Medical Association, Occupational Medicine Program at Harborview Medical Center, Organisation for the Prohibition of Chemical Weapons, U.S. Army Medical Research Institute of Chemical Defense, The Associated Press