Biological Terrorism

Preparing to Meet the Threat

Jeffrey D. Simon, PhD

The threat of terrorists using biological warfare agents has received increased attention in recent years. Despite the hope that, with the right mix of policies, security measures, and intelligence gathering, a major biological warfare terrorist attack can be prevented, the history of conventional terrorism indicates otherwise. The greatest payoff in combating biological terrorism lies in focusing on how best to respond to a terrorist attack. The medical and emergency service communities will play the most important role in that process. Ensuring that they are trained to recognize the symptoms of diseases caused by biological warfare agents and have Critical Incident Stress Debriefing teams available to help them cope with the emotional aspects of treating exposed survivors should be part of contingency planning. By improving our readiness to respond to biological terrorism, many lives can be saved and terrorists denied their goal of creating panic and crisis throughout the country.

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THE THREAT of terrorists using biological warfare (BW) agents has received increased attention in recent years. Congressional hearings,[1] research studies,[2-5] government warnings,[6] and commentaries[7,8] have all pointed to a potentially more ominous terrorism future. Many factors account for this concern—revelations that Iraq, a state sponsor of terrorism, stockpiled anthrax, botulinum toxin, and other BW agents during the Persian Gulf War; the discovery that Aum Shinrikyo, the Japanese religious cult that released the chemical agent sarin in the Tokyo subway system in 1995, had a research and development program for BW agents; the low cost and minimum scientific knowledge required for producing BW agents; and the tendency for terrorists to move into new areas of violence when current ones no longer achieve the intended effect—publicity, reaction, chaos.[9]

Despite this growing concern, however, we still know very little about the nature of BW terrorism. There has never been a major BW terrorist attack. Therefore, there is no track record of incidents, groups, tactics, motives, and targets for analysis to determine the best strategies for combatting this global threat. In this regard, we are today with respect to BW terrorism where we were nearly 30 years ago with respect to "conventional" terrorism. A new international threat was emerging then, but it was unclear as to the direction it would take.

It took several years after the first major international hijacking in 1968 for the diverse nature of conventional terrorism (hijackings, bombings, hostage situations) to become clear and for governments to take action against the threat. Biological warfare terrorism, however, will not allow governments, publics, and the international community the luxury of time to watch this threat unfold and then determine the proper responses. Since BW terrorist attacks could have catastrophic effects in terms of lives lost and create a medical, political, and social crisis unparalleled in our history, it is important to prepare now for this new age of terrorism.

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The first step is to accept the reality that we will not be able to prevent every act of BW terrorism. Governments have learned that painful lesson with respect to conventional terrorism. While preventive measures must continue to be pursued, the greatest payoff in fighting BW terrorism lies in improving our response to an incident. There will be more opportunity for saving lives in the emergency medical response to a BW terrorist attack than in the response to a conventional terrorist attack. Whereas most of the fatalities in a conventional terrorist bombing occur immediately or shortly after the explosion,[10] in BW terrorism the incubation period for the virus, bacterium, or toxin could be several days. Accurate diagnosis and speedy treatment could save many lives.

The medical and health communities will therefore play the most significant role in combatting BW terrorism, and they will have to carry out their duties at a time of unprecedented crisis and fear throughout the country. To the extent that we can reduce the uncertainty about how BW terrorist incidents are likely to

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unfold, the better the medical and health professions will be prepared to deal with the aftermath of this most dangerous form of global terrorism.

BIOLOGICAL TERRORISM: LIKELY TACTICS AND TARGETS

The most distinguishing feature separating BW terrorism from conventional terrorism is the extraordinarily larger number of casualties that could follow a major terrorist attack involving biological agents. Whereas bombings of airplanes or buildings with conventional explosives have occasionally resulted in a few hundred deaths, each act of BW terrorism could result in hundreds of thousands or even millions of casualties.[2] Adding to the death toll would be the fact that civilian populations are not immunized against most BW agents and do not have protective equipment, such as filtered respirators and gas masks, readily available.[1]

Some biological agents have been used in the past for selective attacks. For example, Bulgarian agents assassinated Georgi Markov, a Bulgarian emigré and writer for the British Broadcasting Company, by stabbing him in London with an umbrella-type weapon that contained ricin,[11] which is a potent protein toxin derived from the bean of the castor plant (*Ricinus communis*).[12] (Another Bulgarian émigré, Vladimir Kostove, was attacked in a similar fashion in Paris in 1978, but lived when physicians removed the pellet containing ricin from his body.) However, a terrorist group that uses BW agents will likely be attracted to the mass killing potential of these weapons. It makes little sense for terrorists to experiment with dangerous biological agents—they could be killed handling and using them—if their goal is a limited attack that could have been achieved by using safer and more familiar conventional weapons.

Biological warfare terrorism will also encompass a narrower range of tactics than conventional terrorism. Although BW agents could be used during a hijacking or hostage situation, there would be little incentive for terrorists to do so. The projected death toll would be no higher than if conventional weapons were used. And while BW agents could be delivered against a target by means of a bomb or missile, the likelihood that the organisms will be destroyed in the explosion makes this an unattractive delivery method.[2]

Rather, the most likely BW terrorist tactic will be to release BW agents—anthrax spores, botulinum toxin, ricin, or other deadly agents—into the air as a biological aerosol, a stable cloud of suspended microscopic droplets of bacterial or virus particles.[3] Since BW agents are invisible, odorless, and tasteless, no one would know that a terrorist attack is under way. The aerosol release of BW agents could be accomplished in several ways, including using low-flying airplanes, crop dusters, or trucks equipped with spray tanks and releasing the BW agent upwind of populated areas; leaving aerosol canisters filled with the BW agent and timing devices in subways, airports, air-conditioning/heating systems in buildings, or other crowded places; or directly contaminating bulk food supplies in restaurants, supermarkets, or other places with a BW agent. However, large US water supplies such as a city water supply would not be an attractive target for contamination due to the large amount of BW agent required and water purification procedures used by most cities in the United States.

Since there are no reliable detection systems for BW agents, terrorists will be able to strike any target they desire. Whereas terrorists with conventional weapons have to be concerned about metal detectors, x-ray machines, and other physical security measures, terrorists with BW agents do not face those means of detection. With maximum casualties the likely goal, metropolitan areas are the most at risk. At the present time and for the foreseeable future, major cities in the United States and around the world remain indefensible to a BW terrorist attack.

RESPONDING TO BW TERRORISM: UNCHARTERED WATERS

The heightened concern regarding biological terrorism has led to studies of how well prepared the United States is to respond to a major incident. The findings are not encouraging. During hearings held in 1995 and 1996, the US Senate Permanent Subcommittee on Investigations, for example, found that the United States did not have a plan that coordinated federal, state, and local agencies in managing the consequences of a terrorist attack with a weapon of mass destruction.[1] The subcommittee also found that principal field officers with police, fire, and emergency service departments in major cities are inadequately trained and do not have basic equipment to deal with biological, chemical, or nuclear terrorism, including protective gear, breathing apparatus, decontaminants, and antidotes.[1,13]

The lack of preparedness is attributable to several factors. One is that since the casualties from a biological terrorist incident are so disturbing even to think about, many public officials cling to the hope that with the right mix of police, security measures, and intelligence gathering, BW terrorism can be prevented. Funding for emergency responses to BW terrorism therefore has not been given the high priority it deserves until very recently. The second factor is the difficult task of planning for an event that has never occurred before. Emergency response teams are therefore left only with alternative scenarios to guide them in their plans.

An amendment to the 1997 Defense Authorization Act addresses some of these issues by calling for better training, equipment, and coordination among emergency response personnel in the United States to deal with a terrorist incident involving a weapon of mass destruction.[14] There is also a need for hospitals to have adequate supplies—or ways to quickly obtain these supplies—of antibiotics and antitoxins that could be used to treat those exposed to BW agents. Medical personnel also should be trained to recognize the different symptoms of various BW agents so that those exposed can be treated quickly. Most physicians do not see cases of anthrax in their daily practices.[1]

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An important part of the response to BW terrorism will be dealing with the psychological reactions among survivors, emergency workers, and the public. Terrorism is a form of psychological warfare with terrorists often perpetrating their violence to cause fear among the public. In BW terrorism, that fear will understandably be great as people watch their fellow citizens fall ill and possibly die in large numbers due to anthrax, botulism, or other diseases. Contingency plans for dealing with public hysteria and disruption of health care delivery systems—including the possibility of health care professionals' becoming ill from the BW attack, or fleeing the affected area if they are not confident that they have adequate equipment to protect themselves—should be established in every large city.

The mental health of emergency workers and medical personnel will have to be monitored during a BW terrorism crisis. Research indicates that the most traumatic events for emergency nurses are the death of a child and the death of a coworker.[15] A major BW incident will likely have many of these types of victims. Dealing with dead bodies can also cause emotional and psychological problems for disaster rescue and recovery workers.[6] During a BW terrorist incident, rescue workers will face the unique situation of dealing with large numbers of deaths in a setting that otherwise seems very normal. There will not be any collapsed or bombed-out buildings, fires, plane crashes, and so forth. The psychological impact of that situation on first-

responders needs to be addressed in contingency plans.

The Critical Incident Stress Debriefing (CISD) process could help in dealing with the psychological aspects of a BW terrorist attack. This process is part of a broad crisis intervention program known as Critical Incident Stress Management (CISM), which is designed to prevent or mitigate the development of adverse psychological reactions among emergency service and public safety personnel, nurses, physicians, and disaster workers. The program has been used during earthquakes, plane crashes, terrorist bombings, and other tragic events. Through various psychological intervention techniques, a CISD team led by mental health professionals and including peer support personnel from the emergency services can help emergency workers and medical personnel recover as quickly as possible from the stress associated with the crisis.[17]

A potential problem, however, is that some CISD and CISM teams could become a hindrance to first-responders. They might interfere with the duties of emergency service personnel, or inadvertently aggravate the emotional trauma being experienced by making incorrect assessments of mental health needs. It is therefore crucial that CISD and CISM teams be properly trained for crisis intervention services.

The military will also play an important role in the aftermath of a BW terrorist attack. They will be called on to assist federal and local authorities, just as they have helped local communities following domestic disasters such as hurricanes, floods, and earthquakes.[15] But since their BW training has focused on defending against BW perpetrated by enemy troops in a battlefield setting, there will be a need to retrain them for responding to a BW terrorist attack in a civilian setting.

CONCLUSION

Terrorists with BW agents pose a threat to this nation's—and all nations'—vital interests. In the 1960s, the physicist Herman Kahn wrote a book on fighting a nuclear war entitled *Thinking About the Unthinkable.*[18] Fortunately, we never had to experience that event, and the end of the cold war hopefully means we never will. But we face a new threat at the dawn of the 21st century, and it is one that we must think about and for which we must prepare. By improving our readiness to respond to a BW terrorist attack, many lives can be saved and the terrorists denied their goal of creating panic and crisis in this country.

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