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The Threat of Bioterrorism

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Conclusions

- A review of past incidents suggests limited interest on the part of terrorist groups in biological agents. While some have explored biological weapons as a potential terrorist tool, only a handful have attempted to acquire agents, and even fewer have attempted to use them.
- Yet, there is strong reason to worry that bioterrorism could become a much greater threat. An increasing number of groups-foreign and domestic-are adopting the tactic of inflicting mass casualties to achieve ideological, vengeful, or "religious" goals, often hard to understand. Biological weapons are well suited for their objectives. Moreover, terrorist groups could employ biological agents to incapacitate, rather than kill. Such agents are also potentially useful as instruments of extortion, for political or monetary gain.
- The greater availability of expertise and resources at the command of terrorist groups could overcome past technological barriers to effectively dispersing biological agents, especially if the terrorists gain access to the expertise of a state-sponsored biological warfare program. An attack involving anthrax, for example, could kill tens or hundreds of thousands, if the agent were properly prepared and disseminated.
- In the United States there is growing concern that terrorists will employ biological agents. Law enforcement officials have arrested individuals associated with white supremacist and militia groups for acquiring biological agents. As a consequence of this heightened awareness, the U. S . is improving its ability to respond to biological attacks on American population centers. Both the legislative and executive branches are working to strengthen the federal, state, and local capabilities in the areas of crises and consequence management. Yet, much more will need to be done if we are minimize the potential casualties from a bioterrorist attack.

The Threat of Biological Agents

Biological agents are organisms, or toxins derived from living organisms, that can be used against people, animals, or crops. In contrast, chemical agents, poisonous substances that can kill or incapacitate, are man-made materials. The agents used for biological warfare are drawn from pathogens and toxins that exist in nature. Among the pathogens that have been adopted as biological warfare agents are the organisms that cause smallpox, anthrax, plague, tularemia, brucellosis, and Q-fever. However, a terrorist could use virtually any pathogen or toxin.

Terrorists could employ agents or dissemination techniques different from those adopted by military programs. Thus, while military biological warfare programs have concentrated on aerosol dispersal of biological agents, terrorists have shown a greater interest in contamination of food and water.

Aerosol dissemination: State-sponsored biological warfare programs have concentrated on agents that can be delivered through the air, either when released from an exploding munition or as an aerosol cloud generated by a sprayer. The potential threat from aerosol clouds is evident from a World Health Organization estimate that 50 kilograms of dry anthrax used against a city of one million people would kill 36,000 people and incapacitate another 54,000. While the technology needed for aerosol dissemination is commercially available, so far only one terrorist group has attempted to master this technology.

Water: Water systems have been targeted by terrorist groups, but they are less vulnerable than often imagined. Municipal water systems are designed to eliminate impurities, especially pathogens, to protect public health. As part of this process, communities filter water to remove harmful organisms and add chlorine to kill those remaining. Although extremely difficult, there have been several attempts to deliberately contaminate water supplies with biological agents.

Food: Terrorists also have tried to contaminate food. In general, only uncooked or improperly stored food is vulnerable to biological agents, since the heat generated during cooking readily destroys most pathogens and toxins. This implies that a terrorist would need to target foods that are commonly eaten uncooked, or that are contaminated after being cooked. Alternatively, the terrorists would need to rely on a toxin that can survive cooking.

Anti-Agriculture: Biological agents also can be used against agricultural targets. During the First World War, German spies used biological agents to infect animals purchased for use by Allied military forces. Iraq admits that during the 1980s it was developing at least one biological agent for use against crops, including wheat smut rust, which makes infected grain unusable for human consumption.

The selection of an agent, agent availability and the resources of a terrorist group for producing and disseminating the agent will be influenced by the terrorists' objectives. This may lead to selection of unusual agents not associated with state-sponsored biological weapons programs. Fortunately, many of the alternative agents are unlikely to result in mass fatalities, even if they affect large numbers of people. Fear that a terrorist group might use biological agents that could inflict mass casualties, such as anthrax, is at the heart of the concern about bioterrorism.

Terrorist Interest in Biological Agents

Few terrorists have demonstrated real interest in bioterrorism, and fewer still have made an attempt to acquire biological agents. Indeed, it is possible to identify about a dozen instances in which a terrorist group possessed, attempted to acquire, or threatened to use a biological agent. Only six instances of actual or suspected acquisition are known. In some of the cases it is impossible to determine the seriousness of the interest in biological agents.

The motivations of those interested in biological agents are varied. The Aum Shinrikyo in Japan and RISE in Chicago both wanted to kill large numbers of people. In contrast, the Rajshneeshee in Oregon deliberately selected agents that would only incapacitate large numbers of people. The Minnesota Patriots Council intended to use ricin, a toxin, to murder law enforcement officials.

Terrorist Use of Biological Agents

The FBI reports that there is only one case in the United States in which a terrorist group actually used biological agents. A comprehensive review of all public sources identifies only three instances of terrorist use of biological agents anywhere in the world, although there are probably more that have never been publicly identified.

The one bioterrorism incident that occurred in United States took place in September 1984, and involved the Rajneeshee, a religious cult, who had established a large commune in Wasco County, a rural area east of Portland, Oregon. Relations between the county's residents and the cult were extremely contentious, leading the cult to adopt a plan to take over the

county by manipulating the results of the November 1984 election. They planned to bus homeless people into their commune and register them as voters, and they decided to make the opposing voters sick and thus unable to vote on election day.

To make the people of Wasco County sick, the cult grew *Salmonella typhimurium*, a diarrheal disease, from a culture purchased from a medical supply house (the Rashneeshee had a state-certified medical laboratory in their commune). To test their new weapon, members of the cult attempted to spread the disease during August 1984 in the county seat, the small town of The Dalles. These initial attacks were largely ineffective. On August 29, they gave water laced with *S. typhimurium* to two county commissioners the Rashneeshee considered hostile. Both became sick; one required hospitalization. Although the Rajneeshee were suspected of deliberately poisoning the commissioners, there was no evidence to support such a claim and there was no criminal investigation.

In September 1984, the Rajneeshees redoubled their efforts contaminating the salad bars of 10 restaurants in The Dalles. They spread the disease by pouring vials of media containing the organism over the foods. The result was an estimated 751 cases of salmonellosis. The actual number could have been higher, since the community is on an interstate and some of the infected travelers may not have reported their illness.

Despite the success of this effort, no follow-on attacks were made. The Rajneeshee abandoned their efforts to take over Wasco County by early October, when publicity and legal pressure made it evident they would fail. Two of the Rajneeshees were eventually convicted for their involvement in the plot.

Another bioterrorism incident involved the group responsible for the 1995 dissemination of sarin nerve gas, a chemical agent, in the Tokyo subway system. Aum Shinrikyo, a Japan-based religious cult, produced biological agents and tried to use them. According to Japanese press reports, as recounted in *The Cult at the End of the World,* written by David E. Kaplan and Andrew Marshall, the Japanese police discovered that the Aum included among its members skilled scientists and technicians, including some with training in microbiology, who attempted to generate weapons using anthrax, botulinum toxin, Q-fever, and even ebola. These accounts also suggest that there were four separate attempts to use biological agents, including anthrax once and botulinum toxin three times.

- In April 1990, the Aum Shinrikyo outfitted an automobile to disseminate botulinum toxin through the engine's exhaust. The car was then driven around Japan's parliament building.
- In early June 1993, the cult attempted to disrupt the planned wedding of Prince Naruhito, Japan' s Crown Prince, by spreading botulinum toxin in downtown Tokyo using a specially-equipped automobile.
- In late June 1993, the cult attempted to spread anthrax in Tokyo using a sprayer system on the roof of an Aum-owned building in eastern Tokyo. The anthrax was disseminated for four days.
- On March 15, 1995, the Aum planted in the Tokyo subway three briefcases designed to release botulinum toxin. Apparently, the individual responsible for filling the botulinum toxin had qualms about the planned attack and substituted a non-toxic substance. The failure of this attack led the cult to use sarin in its March 20, 1995 subway attack.

Fortunately, the Aum scientists apparently made mistakes in either the way they produced or disseminated the agents, and, so far as is known, no one became ill or died from the attacks.

Other than Rashneeshee and the Aum Shinrikyo, the only other confirmed attempt by a terrorist group to use bioagents involved the Mau Mau, who used a plant toxin to poison cattle.

Assessing the Bioterrorism Threat

Reviewing published accounts describing terrorist interest in biological agents, it is possible to draw some preliminary conclusions. First, few terrorist groups have attempted to acquire biological agents, and even fewer have actually attempted to use the agents. Second, the number of incidents involving use or attempted use of biological agents is extremely small, especially when compared to the thousands of known terrorist incidents. Third, the number of known victims from bioterrorist incidents is limited to the 751 people who became sick during the 1984 Rashneeshee attacks. There are no known fatalities. Finally, most terrorist groups have used dissemination techniques unlikely to cause mass casualties. Some have specifically targeted individuals, while others have focused on contamination of food and water. Aum Shinrikyo is the only group known to have shown an interest in developing aerosol dissemination capability.

	Table 1: Known Bioterrorism Incidents	
Date	Group	Event
April 1997	Counter Holocaust Lobbyists of Zion	Sent package falsely claiming that it contained anthrax.
February 1997	James Dalton Bell	Advocated assassination of government officials and allegedly investigated toxins
March 1992	Minnesota Patriots Council	Plotted to assassinate law enforcement officials using ricin toxin.
April 1990-March 1995	Aum Shinrikyo	Unsuccessfully tried to use botulinum toxin and anthrax, causing no casualities.
Mid-1980s	Tamil secessionist group in Sri Lanka	Threatened to spread pathogens to infect humans and crops.
August-September 1994	Rejneeshee	Contaminated salad bars and infected 751 people
October 1981	Dark Harvest	Spread dirt contaminated with anthrax.
November 1980	Red Army Faction	Reportedly tried to manufacture botulinum toxin.
June 1976	"B.A. Fox"	Threatened to mail ticks carrying pathogens.
January 1974	SLA	Showed some interest in biological warfare.
January 1972	RISE	Attempted to acquire biological agents to contaminate water systems.
November 1970	Weathermen	Attempted to acquire biological agents to contaminate water systems.

1950s	Mau Mau	Used plant toxins to kill livestock.

However, will past patterns hold true in the future, and if not, what factors would cause a change? Unfortunately, there is strong reason for concern that future bioterrorism attacks may be far more deadly than past incidents. Three factors account for the change.

First, there are terrorists who want to kill large numbers of people. There have been such groups in the past, but there appear to be a growing number who want mass casualties. The World Trade Center and Oklahoma City bombings both were conducted by people who had no compunction about mass killing. Second, the technological sophistication of the terrorist groups is growing. The Aum Shinrikyo was attempting to master the intricacies of aerosol dissemination of biological agents. Some terrorists might gain access to the expertise generated by a state-directed biological warfare program. Finally, Aum Shinrikyo demonstrated that terrorist groups now exist with resources comparable to some governments. It seems increasingly likely that some terrorist group will become capable of using biological agents to cause massive casualties.

Responding to the bioterrorism challenge

Responding to the shock of the Aum Shinrikyo attacks, Congress passed the "Defense Against Weapons of Mass Destruction Act of 1996" (Nunn-Lugar-Domenici). This initiative directed the President to enhance federal capabilities to respond to NBC terrorist threats and to assist in the creation of state and local government response capabilities.

The Department of Defense (DOD) was assigned a major role in supporting this initiative through its support of the FBI, which has the lead on the law enforcement side (known as crisis management) and the Federal Emergency Management Agency (FEMA), which has the lead in coping with the damage inflicted by a terrorist attack (known as consequence management).

DOD currently has two units with bioterrorism response capabilities, the Army's Technical Escort Unit (TEU) and the Marine Corps' Chemical-Biological Incident Response Force (CBIRF). DOD also possesses scientific capabilities that can be used in support of the civilian community, such as the U.S. Army's Institute for Infectious Diseases (USAMRIID) and the Naval Medical Research Institute (NMRI). At the same time, DOD is training and assisting local emergency response personnel in NBC contingencies.

Recommendations

Despite DOD's unique contributions, the primary responsibility for responding to bioterrorism attacks will fall on civilian organizations, including local and state emergency response groups and federal agencies with disaster response missions. This suggests that the primary focus of our responses to bioterrorist threats must be on those civilian groups and agencies.

- The United States should strengthen the disease surveillance systems operated by the federal, state, and local public health systems. Routine disease reporting systems are likely to be the first indicator of a bioterrorism attack, and the consequences of an attack will be magnified by inadequate surveillance.
- The capabilities of the law enforcement community to address potential bioterrorism incidents should be strengthened.
- The United States needs improved intelligence capabilities to track the interest of terrorist groups in developing biological toxins and delivery vehicles, and-to the extent possible-to provide warnings when terrorists begin production and before they attempt to employ such biological weapons.

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