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Weapons of Mass Destruction: The Terrorist Threat

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Summary

The continuing possibility of terrorist attacks using nuclear, biological, or chemical weapons is an ongoing concern in the national security policy arena in the face of a clear trend among terrorists to inflict greater numbers of casualties. Until the anthrax attacks targeted at selected individuals in the Congress and the media, it was thought that the terrorists most likely to attempt attacks with weapons of mass destruction (WMD) were extremist religious groups and small splinter terrorist cells. Though incomplete, the investigation into the anthrax attacks has begun to suggest that a domestic “lone wolf” with professional biotechnical expertise may be responsible.

Worldwide, the likelihood of terrorists being capable of producing or obtaining WMD may be growing due to looser controls of stockpiles and technology in the former Soviet states specifically, and the broader dissemination of related technology and information in general. However, WMD remain significantly harder to produce or obtain than what is commonly depicted in the press. The Central Intelligence Agency has reported that it is likely that most terrorists will continue to choose conventional explosives over WMD, but warns that the al-Queda network has made obtaining WMD capability a very high priority. This report will be updated in the event of significant further developments. For a more comprehensive discussion of terrorism and relevant legislation, see the CRS Electronic Briefing Book [<http://www.congress.gov/brbk/html/ebter1.shtml>].

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Weapons of Mass Destruction: The Terrorist Threat

Background

Weapons of mass destruction is a former Soviet military term which was euphemistically used to denote nuclear, chemical, and biological weapons. It is now widely used, despite debate over its appropriateness, and its definition has broadened to include radiological weapons.¹ For some, particularly in the wake of the World Trade Center airliner attacks, the term WMD has come to include any means capable of inflicting mass casualties. This report will, however, focus on the nuclear, chemical, and biological threat.

Even before the Fall of 2001, catastrophic terrorism had become a significant issue in the national security arena, and spurred debate over the nature of the threat and the appropriate response. Several occurrences over the last decade contributed to this increasing attention: the 1995 Aum Shinrikyo's nerve agent attack in the Tokyo subway, the Oklahoma City and World Trade Center bombings in the United States, and the 1998 bombings of the U.S. embassies in Kenya and Tanzania. Also of concern has been the possibility of WMD proliferation to terrorists from the former Soviet states where old research, production and storage facilities remain with questionable security and economically distressed personnel. In light of the heightened attention and increased government spending, the General Accounting Office (GAO) repeatedly called for additional risk assessment of the possibilities of a WMD terrorist attack.²

However, it has been the combined effect of the latest World Trade Center attacks and the subsequent anthrax attacks on Capitol Hill and news media organizations, that has spurred unprecedented attention on this issue. These attacks have also highlighted the irony that anthrax, a so-called weapon of mass destruction, actually produced dramatically fewer casualties and destruction than the airliners crashing into the World Trade Center.

¹ Radiological weapons use conventional high explosives to disperse radioactive material over an area. They are useful primarily as an area denial weapon, forcing evacuation and extensive decontamination.

²U.S. General Accounting Office (GAO), *Combating Terrorism — Need for Comprehensive Threat Assessments of Chemical and Biological Attacks*, GAO/NSIAD-99-163, September 1999.; *Combating Terrorism: Linking Threats to Strategies and Resources*, GAO/T-NSIAD-00-218, July 26,2000.

Terrorist Motivation to Use Weapons of Mass Destruction

Traditional Motivations and Constraints

A number of factors are seen as having previously constrained terrorist use of WMD. Most terrorists groups possess political goals and have traditional, ethnic, nationalist, or ideological associations.³ These groups seek to gain politically from attacks and to draw the attention of large audiences without diminishing their base of support. The conventional wisdom was reflected in expert Brian Jenkins comment several years ago, “Terrorists want lots of people watching, not lots of people dead.” For some groups, this is demonstrably no longer the case. However, even if a terrorist group sought to create an atmosphere of terror by inflicting large numbers of casualties, it need not turn to WMD, as the latest World Trade Center airliner attacks graphically demonstrated.⁴ In another comparison of conventional vs WMD attacks, 168 people died in the conventional bomb attack in Oklahoma City, while only 12 people died in the nerve agent attack in the Tokyo subway.

WMD use is risky for the terrorists themselves, uncertain in its effects, and carries with it the possibility of severe retaliation. However, the increasing casualty count of attacks over the last several years has led many to argue that growing terrorist fanaticism and erosion of traditional constraints have negated the stigma of WMD.⁵ Although WMD terrorism remains rare, the Central Intelligence Agency has reported for the last several years that terrorist interest in WMD is growing, as is the number of potential perpetrators.⁶ This assessment has been reinforced with the discovery of documents in Afghanistan indicating the interest of both the Taliban and the al-Qaeda network in weapons of mass destruction.

Potential WMD Terrorists

Prior to the Fall 2001 anthrax attacks, the Center for Nonproliferation Studies at the Monterey Institute of International Studies conducted a study of terrorist use of chemical and biological weapons.⁷ The institute identified six characteristics among the groups involved in chemical/biological weapons (CBW) incidents: charismatic

³Ehud Sprintzak, “The Great Superterrorism Scare” *Foreign Policy* Fall 1999; John Parachini, *Combating Terrorism: Assessing the Threat*, Congressional Testimony (Prepared Statement) before the House Committee on Government Reform, Subcommittee on National Security, Veterans Affairs, and International Relations, October 20, 1999. For a discussion of trends and definitions see: Raphael E. Perl, *Terrorism, the Future, and U.S. Foreign Policy*, CRS Issue Brief IB95112, pp. 1-3.

⁴The Department of Health and Human Services defines mass casualties as more than 1,000.

⁵Walter Laqueur, “Terror’s New Face”, *Harvard International Review*, Fall 1998. Department of State, *Patterns of Global Terrorism 2000*, April 2001.

⁶GAO, *Combating Terrorism*, GAO/NSIAD-99-163, September 1999, p.18.

⁷Tucker, Jonathan, ed., *Toxic Terror: Assessing Terrorist Use of Chemical and Biological Weapons*, MIT Press, Cambridge, MA, 2000.

leadership, no external constituency, apocalyptic vision, loner or splinter group, sense of paranoia/grandiosity, and preemptive aggression. The two common characteristics that appeared in all cases of actual CBW use were the lack of outside constituency and a sense of paranoia/grandiosity. Only a limited number of groups were motivated enough to employ CBW, amongst them religious millenarian groups, small terrorist cells, and brutalized groups seeking revenge or facing destruction.⁸

Though the continuing investigation of the Fall 2001 anthrax attacks has reached few firm conclusions, there is no evidence yet that a known terrorist organization was involved. While initial suspicions, given the timing of the attacks, focused upon al-Qaeda or possibly Iraq as possible perpetrators, it is now suspected that the attacks were domestic in origin. It has also been suggested that the attacks may have been carried out by a “lone wolf” terrorist, possibly someone with previous professional access to weaponized anthrax. Though the effects of the attacks were very significant, particularly on the U.S. Postal Service and the Capitol Hill building complex, the means of dissemination (i.e., tape-sealed letters addressed to specific individuals) indicates that mass casualties were not intended. The specific targeting of news media and Democratic senators has led a growing number of experts to believe that the perpetrator did not anticipate, or even desire, the widespread agent dispersal inadvertently occasioned by mail-handling equipment. One possible motivation suggested for the attacks has been the desire of the perpetrator to deliver a perversely extreme warning to the media and government officials about the seriousness of the bioterrorism threat. This remains pure speculation, but would make it relatively unlikely there would be follow-up attacks from the same source.⁹

Another irony stemming from the Fall 2001 anthrax attacks, is that the combination of relatively few casualties, but very extensive disruption, could make this a desirable weapon for those terrorists who do not seek mass casualties, but rather seek significant psychological, social, or economic disruption. Simply the **potential** for mass casualties occasions significant long-term protective measures and heightens public anxieties.

Osama bin Laden’s al-Qaeda organization remains the group of greatest concern for terrorist use of nuclear, chemical, and biological weapons. The U.S. intelligence community has long reported that al-Qaeda is attempting to acquire this type of weapons capability. Documents and interrogations from military operations in Afghanistan have reinforced the assessment that the Taliban sought, and al-Qaeda, continues to seek to develop biological weapons and obtain radioactive material for a radiological weapon.¹⁰ Loss of operating bases in Afghanistan and intensified

⁸Sprintzak, Ibid

⁹ “Capitol Hill Anthrax Matches Army’s Stock”, *Washington Post*, December 16, 2001. p. 1.

¹⁰ Director of Central Intelligence, Testimony before the Senate Select Committee on Intelligence, February 6, 2002.

world-wide investigations of al-Qaeda has probably disrupted the organization's WMD weapons acquisition efforts, but is generally assumed that they will not cease.¹¹

Terrorist Acquisition of WMD Capabilities

Nuclear

While a nuclear weapon is the most destructive of all WMD, obtaining one poses the greatest difficulty for terrorist groups. The key obstacle to building such a weapon is the availability of a sufficient quantity of fissile material — either plutonium or highly enriched uranium. Some experts believe that if allowed access to the necessary quantities of fissile material, extraordinarily capable groups could build a crude nuclear weapon.¹² A much less difficult nuclear option is a radiological weapon using conventional high explosives to disperse any type of radioactive material. The obviates the need for fissile material and the complexity of a nuclear bomb. Though unlikely to cause mass casualties, radiological weapons could still have very significant radiation contamination effects if well-targeted.

Some experts point to Iraq's efforts to acquire a nuclear capability — a nation with economic resources, technical expertise, and motivation — to demonstrate the significant difficulty of building even a crude nuclear weapon.¹³ State sponsors of terrorists have been considered unlikely to turn over control of such weapons, once developed, to terrorist groups because of possible international retaliation or concern that the groups might leave their control. However, the problem of “loose nukes,” i.e., the possible leakage of nuclear weapons material and technical know-how from the former Soviet states, remains a cause of concern that some believe increases the likelihood of a terrorist group obtaining a nuclear capability. It is important to note that even if a terrorist group were to get hold of an **assembled** nuclear weapon covertly, the built-in safeguards and self-destruction mechanisms would pose a serious challenge to detonating the weapon. In addition, the size of most nuclear weapons makes them rather hard to transport, especially clandestinely.¹⁴ The most likely means for such transport is judged to be commercial shipping.

Biological

According to a recent GAO report, terrorists working outside a state-run laboratory would have to “overcome extraordinary technical and operational

¹¹ For a detailed account of Bin Laden's search for WMD see: Stefan Leader, “Usama Bin Laden and the Terrorist Search for Weapons of Mass Destruction” *Jane's Intelligence Review*, 6/1/1998, Vol 011, Issue 006; Also, Kenneth Katzman, *Terrorism: Middle Eastern Groups and State Sponsors*, CRS Report RL30277.

¹²Richard A. Falkenrath, “Confronting Nuclear, Biological and Chemical Terrorism”, *Survival*, Autumn 1998.

¹³Karl-Heinz Kamp, “WMD Terrorism-An Exchange” *Survival*, Winter 1998/1999

¹⁴Ibid.

challenges to effectively and successfully weaponize and deliver a biological agent to cause mass casualties.”¹⁵ Despite the Fall 2001 anthrax attacks, this statement may still hold some validity. The attacks did not result in mass casualties, and investigators suspect that the anthrax used may have been obtained from a Department of Defense government-sponsored laboratory.¹⁶ This has led to much greater attention to the issue of physical security in those laboratories/facilities, both governmental and civilian, that house dangerous pathogens.¹⁷

While many biological agents can be obtained or grown with relative ease, several significant steps remain on the way to weaponization and effective use of these agents. The main challenge is effective dissemination, which requires an aerosol form. The formulation of agents for airborne dispersal requires dissolving optimal amounts of agent in a specific combination of different chemicals (with each agent requiring a unique formulation). Moreover, aerosol disseminators need to be properly designed for the agent used, and suitable meteorological conditions must be present to carry out a successful BW mass casualty attack. The Aum Shinrikyo sect again provides an example of the difficulty of conducting a successful attack. The sect had substantial resources, members who were trained chemists and bioscientists, motivation, and ample time for research. Yet, they failed to carry out an effective BW attack despite several attempts, apparently due to the agent choice, and a formulation that clogged the nozzles of the aerosol sprayers¹⁸ However, some experts believe that less efficient aerosol techniques may be obtained by capable non-state groups, and that even a crude delivery system could still cause casualties or injuries in the thousands, especially if the attack is carried out against a large indoor population.¹⁹

Of particularly great concern is the threat of highly contagious diseases, particularly smallpox. Anthrax is not contagious from person to person, consequently its spread can be relatively easily contained. With a disease like smallpox, however, contagion can spread very rapidly. The breath or coughing of an infected person at the fever stage of the disease is sufficient to infect those around him or her. The disease has an incubation period of 12-14 days, during which an infected person experiences no symptoms. Consequently, a clandestine smallpox release in a major transportation hub could infect hundreds, and would, in two weeks time, result in disease outbreaks wherever the passengers eventually traveled. Smallpox has been eradicated as a naturally occurring disease, and the only two known existing cultures

¹⁵GAO, *Combating Terrorism...*, pp.13,7.

¹⁶ “FBI Hones [sic] in on Military Labs in Hunt for Source of Anthrax”, *Wall Street Journal*, February 12, 2002

¹⁷ See. H.R. 3016: To amend the Antiterrorism and Effective Death Penalty Act of 1996 with respect to the responsibilities of the Secretary of Health and Human Services regarding biological agents and toxins, and to amend title 18, United States Code, with respect to such agents and toxins; and H.R. 3160: To amend the Antiterrorism and Effective Death Penalty Act of 1996 with respect to the responsibilities of the Secretary of Health and Human Services regarding biological agents and toxins, and to amend title 18, United States Code, with respect to such agents and toxins.

¹⁸Ibid

¹⁹Falkenwrath, Ibid.

of the virus are held by the United States and Russia. Even so, concerns over the security of the Russian samples and the possibilities of unknown samples, have kept smallpox in the forefront of threat considerations. Though the probability of terrorists gaining access to the virus may be very low, the severity of the potential consequences has nevertheless led the federal government to begin stockpiling 300 million smallpox vaccine doses.

A relatively new concern is agroterrorism: the use of biological agents against agricultural targets. The recent outbreaks of foot-and-mouth and “mad cow” disease in Europe have demonstrated the tremendous economic damage done to agricultural markets even when these epidemics occur naturally. Agroterrorism also provides the opportunity to inflict significant economic and social disruption without the stigma of inflicting human casualties. It is generally agreed that there is no way to guarantee protection against agroterrorist attacks; the targets and opportunities are too many. Consequently, significant attention must be paid to rapid detection and remediation.²⁰

Chemical

Toxic industrial chemicals such as chlorine or phosgene are easily available and do not require great expertise to be adapted into chemical weapons. Nerve agents are more difficult to produce, and require a synthesis of multiple precursor chemicals.²¹ They also require high-temperature processes and create dangerous by-products, which makes their production unlikely outside an advanced laboratory. Blister agents such as mustard can be manufactured with relative ease, but also require large quantities of precursor chemicals. The production and transfer of CW precursor chemicals is internationally monitored under the Chemical Weapons Convention and the informal international export control regime of the Australia Group, providing some degree of control over their distribution²²

Aerosol or vapor forms are the most effective for dissemination, which can be carried out by sprayers or an explosive device. However, agents are vulnerable to temperature, moisture and wind, and would therefore be most effectively used on an indoor population. The Aum Shinrikyo again provides an example of the unpredictable effectiveness of chemical weapons. Although the cult was able to produce the nerve agent Sarin and release it in a closed environment — the Tokyo subway — the attack resulted in only 12 fatalities, whereas there were 301 fatalities and 5,000 injured in the conventional bombing of the U.S. embassies in Kenya and Tanzania.²³

²⁰ “Planting Fear: How Real is the Threat of Agricultural Terrorism?”, *Bulletin of Atomic Scientists*. September/October 201. p. 38.

²¹Statement of Henry L. Hinton, Jr., Assistant Comptroller General, National Security and International Affairs Division, before the House Committee on Government Reform, Subcommittee on National Security, Veterans Affairs , and International Relations, on *Combating Terrorism: Assessing the Threat*, October 20, 1990.

²²GAO report GAO/NSIAD-99-163, *Combating Terrorism...* p. 12.

²³John Parachini, *Combating Terrorism: Assessing the Threat*, Congressional testimony (continued...)

Since the September 11 attacks, the U.S. chemical industry has begun to pay greater attention to the possibility of terrorist sabotage of facilities housing toxic chemicals. This approach could provide the effects of a chemical weapons attack without requiring a terrorist group to either develop or obtain chemical agents on their own. The potential consequences of such an occurrence were graphically demonstrated in Bhopal, India in 1984, when a disgruntled pesticide plant employee is believed to have caused the release of 40 metric tons of methyl isocyanate into the atmosphere. Over 2,000 people were killed and 100,000 injured, of whom an estimated 50,000 suffered permanent disabilities.²⁴ Though the manufacturing plants, storage depots, and hazardous materials transportation infrastructure have long been recognized by counterterrorist experts as potential targets, until recently relatively little attention had been paid to the problem by private industry or the government. In January 2002, the American Chemical Council [<http://www.cmahq.com/>] (formerly the Chemical Manufacturers' Association) made enhanced securities measures mandatory for its members. Legislation has also been introduced to address this issue, seeking to require specific security measures to protect toxic chemical facilities.²⁵

²³(...continued)

before the House Committee on Government Reform, Subcommittee on National Security, Veterans Affairs, and International Relations, October 20, 1999.

²⁴ "Bhopal Disaster Spurs U.S. Industry, Legislative Action", United States Chemical Safety and Hazard Investigation Board [<http://www.chemsafety.gov/lib/bhopal01.htm>]

²⁵ S. 1602 (Chemical Security Act of 2002) directs the Administrator of the Environmental Protection Agency to promulgate regulations to: (1) designate certain combinations of chemical sources and substances of concern as high priority categories based on the severity of the threat posed by an accidental or criminal release of such substance; and (2) require each owner and operator of a high priority category chemical source to take specified actions to prevent, control, and minimize the potential consequences of such a release.