

Report for Congress

Received through the CRS Web

Terrorist Motivations for Chemical and Biological Weapons Use: Placing the Threat in Context

March 28, 2003

Audrey Kurth Cronin
Specialist in Terrorism
Foreign Affairs, Defense, and Trade Division

Report Documentation Page

Form Approved
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE 28 MAR 2003	2. REPORT TYPE N/A	3. DATES COVERED -		
4. TITLE AND SUBTITLE Terrorist Motivations for Chemical and Biological Weapons Use: Placing the Threat in Context		5a. CONTRACT NUMBER		
		5b. GRANT NUMBER		
		5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S)		5d. PROJECT NUMBER		
		5e. TASK NUMBER		
		5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) David D. Acker Library and Knowledge Respiratory Defense Acquisition University Fort Belvoir, VA 22060		8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)		
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited				
13. SUPPLEMENTARY NOTES				
14. ABSTRACT				
15. SUBJECT TERMS				
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified	SAR	18. NUMBER OF PAGES 11
				19a. NAME OF RESPONSIBLE PERSON

Terrorist Motivations for Chemical and Biological Weapons Use: Placing the Threat in Context

Summary

There is widespread belief that the likelihood of terrorist use of chemical and biological weapons (CBW) is increasing, in part as a result of publicized new evidence of terrorist interest and capabilities, as well as the political fall-out from the war in Iraq. This is a serious present concern that deserves examination in the broader framework provided by the patterns, motivations and historical context for the current terrorist threat. Although it can have a powerful psychological impact, past CBW use by terrorists has been rare and has not caused a large number of casualties, especially compared to other weapons. Terrorist attacks are deliberately designed to surprise, so no trend analysis will ever perfectly predict them, especially in the contemporary international climate. This report presents the arguments for and against future nonstate terrorist acquisition and/or use of CBW weapons against the United States, as well as a brief discussion of issues for congress concerning how best to counter the threat. It will not be updated.

Contents

Background	1
Possible Reasons for Increased Terrorist Use	2
Possible Reasons Against Terrorist Use	6
Issues for Congress	7

Terrorist Motivations for Chemical and Biological Weapons Use: Placing the Threat in Context

Background

Current popular attention being paid to the threat of chemical and biological weapons (CBW) use by terrorists may give the impression that this is a new phenomenon, but it is not. Most chemical and biological weapons themselves have a long history: the first chemical weapons were used in ancient Greece; biological weapons have been used in a wartime context since at least the Middle Ages.¹ Employed extensively in the first World War, notably in the use of mustard gas, chemical weapons have evolved very little in their technology since the mid-twentieth century. Although recent technological advances in biological weapons have been made, the vaccines and treatments available to deal with some of them have also advanced. Historically, most terrorist groups have avoided using CBW, in part because they do not want to alienate their own constituencies, and in part because they have not had the technical expertise to turn them into effective weapons.² Those CBW attacks that have occurred represent a small proportion of the total number of international terrorist incidents.³ CBW weapons have rarely been used by subnational groups.

But there is growing concern that past patterns of use could be about to change. Many experts worry about the increasing availability of CBW in the last decade or so, combined with the serious *psychological* impact that their use would have. This concern was heightened after 1995, when the Japanese terrorist organization Aum Shinrikyo used the chemical nerve agent sarin on the Tokyo subway, killing 12

¹ “Chronology of State Use and Biological and Chemical Weapons Control,” Center for Nonproliferation Studies, Monterey Institute of International Studies, accessed at [<http://cns.miis.edu/research/cbw/pastuse.htm>].

² For more information about technical aspects of the threat, see CRS Report RL31669, *Terrorism: Background on Chemical, Biological, and Toxin Weapons and Options for Lessening Their Impact*, by Dana Shea., and CRS Report RL31332, *Weapons of Mass Destruction: The Terrorist Threat*, by Steve Bowman.

³ For example, the U.S. State Department lists 348 international terrorist attacks for 2001, whereas the Center for Nonproliferation Studies lists only 25 CBW attacks. Even accounting for differences in how incidents are counted, there is a large magnitude of difference. U.S. Department of State, *Patterns of Global Terrorism*, Office of the Coordinator for Counterterrorism, May 2002, p. 171; and Adam Dolnik and Jason Pate, “2001 WMD Terrorism Chronology,” CNS Reports, Monterey Institute of International Affairs, accessed at [<http://cns.miis.edu/pubs/reports/cbrn2k1.htm>].

people and injuring up to 6,000. The group's efforts, which fell far short of its goals, attracted widespread attention and helped increase focus on the so-called weapons of mass destruction (WMD) terrorist threat.

While there is considerable information about state acquisition and/or use of CBW, evidence regarding nonstate acquisition and/or use is contradictory and often sketchy.⁴ Although hard evidence is limited, a sampling of terrorist groups or individuals that are reported to have shown an interest in or used chem-bio agents (usually in very limited ways) includes the PKK (Kurdistan Worker's Party), believed to have weaponized the nerve gas sarin; HAMAS (Islamic Resistance Movement), which has reportedly coated shrapnel with poisons and pesticides; numerous U.S. domestic individuals and groups without foreign connections (including the Minnesota Patriots Council, the so-called "Alphabet Bomber," R.I.S.E., Larry Wayne Harris, and others) who have used or intended to use ricin, plague, anthrax, hydrogen cyanide, sarin, and other agents; and of course Al Qaeda and its associated groups.⁵ But the efforts of Aum Shinrikyo represented a watershed, with its bizarre and seemingly irrational agenda, its systematic pursuit of technical competency, and its repeated attempts to kill a large number of Japanese civilians. Even with its multiple technical failures, Aum Shinrikyo led to heightened anxiety about the attractiveness and feasibility of future mass casualty terrorist use of CBW.

Still, numerical trends for CBW attacks have not increased. According to the Monterey Institute of International Studies' terrorism chronology, between 2000 and 2001 (the last year for which published data are available), the number of hoaxes went up (from 25 to 603) but the number of CBW incidents actually decreased (from 48 to 25).⁶ Thus it would appear that the fall 2001 anthrax attacks in the United States resulted in numerous copy-cat hoaxes, but they did not reflect an overall increase in bioterrorism events. However, terrorism experts continue to worry about the use of chemical and biological agents.

Possible Reasons for Increased Terrorist Use

The reasons for increased potential use can be grouped into four major categories: the growth of militant religious groups with political agendas as a percentage of all terrorist groups, the increasing global availability of CBW information and stockpiles, the internationalization of the threat of terrorism, and the clear evidence of terrorist interest and capabilities.

⁴ Indeed, some of the most-often cited examples of terrorist use of chem-bio agents have proven to be overblown or lacking evidence. See Jonathan B. Tucker, editor, *Toxic Terror: Assessing Terrorist Use of Chemical and Biological Weapons* (Cambridge, Mass.: MIT Press, 2000), especially chapters 3, 6, and 7.

⁵ Amy Sands, "Deconstructing the Chem-Bio Threat: Testimony for the Senate Foreign Relations Committee," March 19, 2002, accessed at [<http://cns.miis.edu/pubs/reports/asands.htm>], p. 6; *Patterns of Global Terrorism 2001*; and Tucker, *Toxic Terror*. This list is illustrative, not comprehensive.

⁶ Dolnik and Pate, "2001 WMD Terrorism Chronology."

First, there has been a sharp increase in militant religious groups internationally as a percentage of all terrorist groups. Over the last years of the twentieth century, such groups went from being just over three percent of all identified terrorist groups in 1980 to forty-three percent by 1995.⁷ Militant religious terrorists, experts note, may label their victims as heretics or infidels and thus unfit to live. The incentives for such groups to kill large numbers of people may thus be unconstrained by the scruples of earthly constituencies.

In combination with this worrisome development, the lethality per terrorist attack went up over the course of the past decade. While there were fewer attacks overall in the 1990s, the number of people killed and maimed per attack increased. This confirmed the fear of many experts that terrorism based on extreme religious beliefs, in association with other developments discussed below, might be even more dangerous than were the left wing, right wing, and ethnonationalist/separatist groups that predominated in earlier years.⁸ A larger proportion of the attacks that did occur were executed by persons with religion-based animus. The tragedies of September 11th seemed to bear out both of these trends.

Second, there is a growing concern about the increasing availability of information and resources for the building of weapons by subnational groups that in former years had been feasible only with the resources of a state. Like the rest of the world, terrorist groups have access to the vast amount of technical data disseminated through the Internet. More and more information that might previously have been difficult to collect is becoming easily accessible. Among the groups that have reportedly demonstrated interest in acquiring unconventional weapons (besides Al Qaeda) are the PLO, the Red Army Faction, Hezbollah, the Kurdistan Workers' Party, German neo-Nazis, and the Chechens.⁹ At the same time, the breakup of the Soviet Union increased potential access to a vast, highly advanced arsenal of not only nuclear but also chemical and biological weapons and expertise. The combination of greater movement of people, knowledge and products across borders in a globalized world, and greater availability of materials and expertise in the post-Soviet era, have together led to a potentially serious erosion in state control over chemical and biological weapons (or their ingredients).¹⁰

⁷ In 1980 there were 2 out of 64, and in 1995 there were 25 out of 58 religious groups listed in the RAND-St. Andrews University Chronology of International Terrorism. See Bruce Hoffman, *Inside Terrorism*, (New York: Columbia University Press, 1998) pp. 90-91; and Nadine Gurr and Benjamin Cole, *The New Face of Terrorism: Threats from Weapons of Mass Destruction* (London: I.B. Tauris, 2000), pp. 28-29. Admittedly, some of that increase may be accounted for by changes in how groups are categorized.

⁸ These figures are derived from an examination of annual data from *Patterns of Global Terrorism*. See Audrey Kurth Cronin, "Behind the Curve: Globalization and International Terrorism," *International Security*, Vol. 27, No. 3 (Winter 2002/03), p. 42-43.

⁹ Richard A. Falkenrath, Robert D. Newman, and Bradley A. Thayer, *America's Achilles' Heel: Nuclear, Biological, and Chemical Terrorism and Covert Attack* (Cambridge, Mass.: MIT Press, 1998), pp. 31-46.

¹⁰ Another factor is the general increase in off-the-shelf technology that is dual-use in nature. See CRS Report RS21422, *Dual-Use Biological Equipment: Difficulties in Domestic* (continued...)

Third, the nature of international terrorism has evolved in dangerous ways in recent years. Although many traditional groups carry on in their struggles, the growth of religiously-oriented groups has led to an increased commonality of interests between populations in disparate geographical areas. In part in reaction to American global policies and cultural as well as political global reach, groups are developing ties across formerly divisive ideological, ethnic, and national lines. The area of potential recruits is thus broader than it might have been for a traditional ethnonationalist/separatist group supported only by its local constituency, for example. Also, this internationalization of the threat has often led to a greater distance between groups and targets. The result is not only a removal of moral constraints but also political constraints, with less worry about potentially sullyng a homeland or killing potential constituents. Thus, the internationalization of terrorism may unfortunately imply an increase in just the sorts of incentives that lead groups to consider unconventional weapons.

Fourth, and perhaps most important, there are clear indications of interest in CBW on the part of contemporary terrorist groups, as well as some evidence of actual capabilities. With a long-standing expressed desire to acquire them and a demonstrated willingness to kill Americans, Al Qaeda (and its associates) is the group that most worries U.S. experts. Osama bin Laden has reportedly pursued the development of chemical and biological weapons since the early 1990s.¹¹ In 1998, he spoke of acquiring weapons of mass destruction being a “religious duty,” and the eleventh volume of Al Qaeda’s 5,000-page “Encyclopedia of Jihad” is devoted to explaining how to construct CBW.¹²

There are many substantiated examples in the open press of efforts by Al Qaeda and its allies to develop these weapons. During operations in Afghanistan, coalition forces found trace amounts of ricin and anthrax at five or six sites, as well as evidence of an interest in plague, cyanide, and botulinum toxin.¹³ In December 2001, CNN obtained a cache of 64 Al Qaeda video tapes containing gruesome evidence of experiments using an apparent nerve gas against dogs.¹⁴ Further afield, in 2002 a reported plot by nine Moroccans to use a cyanide compound to poison the

¹⁰ (...continued)

Regulation, by Dana Shea.

¹¹ The Central Intelligence Agency, *Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, 1 January Through 30 June 2001*, accessed at [http://www.cia.gov/cia/publications/bian/bian_jan_2002.htm], on March 11, 2003.

¹² Kimberly McCloud, Gary A. Ackerman, and Jeffrey M. Bale, “Chart: Al-Qa’ida’s WMD Activities,” Center for Nonproliferation Studies, Monterey Institute of International Studies, accessed at [http://cns.miis.edu/pubs/other/sjm_cht.htm], on March 6, 2003.

¹³ “Al Qaeda: Anthrax Found in Al Qaeda home,” *Global Security Newswire*, 10 December 2001; Judith Miller, “Labs Suggest Qaeda Planned to Build Arms, Officials Say,” *New York Times*, September 14, 2002; cited *Ibid*.

¹⁴ Nic Robertson, “Tapes shed new light on bin Laden’s network,” *CNN.com/U.S.* August 19, 2002; accessed at [<http://www.cnn.com/2002/US/08/18/terror.tape.main/index.html>] on March 26, 2003.

water supply of the U.S. Embassy in Rome was disrupted; several of the men involved had ties to Al Qaeda.¹⁵ In January 2003, a reported plot by six Algerians to use ricin was uncovered in a London apartment. One of the six arrested had attended Al Qaeda training camps, whereas the others had received training in Chechnya and the Pankisi Gorge region of Georgia.¹⁶ Most recently, evidence seized in March 2003 with the arrest of operations chief Khalid Shaikh Mohammed demonstrated surprising technical sophistication, with production timetables and manufacturing specifications for bio-chemical agents, especially weaponized anthrax.¹⁷ In addition to these highly publicized examples, there are many other press reports of varying reliability.

It is hard to know with confidence what the logic of this apparently growing interest in CBW is. If high casualties are the intended end, these agents are not the most effective means: chem-bio agents are generally more useful for increasing anxiety and panic than causing high numbers of casualties. Projections of tens of thousands of casualties are theoretically possible,¹⁸ but many such estimates are worst-case scenarios likely to occur in hard-to-achieve circumstances, with ideal weather conditions, temperature controls, dispersion rates, concentrations of agent, and so on.¹⁹ Still, terrorism is a psychological weapon, intended for political effect. The goal might instead be to cause economic damage, or to show strength and increase political support or leverage, or to copy other terrorist groups, or to emulate the technological capabilities of states—or some combination of these. While this is a fine line to draw, there is a danger that Western governments might overstate and hype the threat, leading to some of the same outcomes by heightening anxieties. There are a large number of practical obstacles to terrorists using these weapons, and these will be discussed next.

¹⁵ Eric Cuddy, Matthew Osborne, and Kimberly McCloud, "Chemical Terrorist Plot in Rome?" Research Story of the Week, Center for Nonproliferation Studies, Monterey Institute of International Studies, accessed at [<http://cns.miis.edu/pubs/week/020311.htm>], on March 19, 2003.

¹⁶ Jeffrey M. Bale, Anjali Bhattacharjee, Eric Cuddy, Richard Pilch, "Ricin Found in London: An al-Qa`ida connection?" CNS Reports, Center for Nonproliferation Studies, Monterey Institute of International Studies, accessed at [<http://cns.miis.edu/pubs/reports/ricin.htm>], on March 6, 2003.

¹⁷ Barton Gellman, "Al Qaeda Near Biological, Chemical Arms Production," *The Washington Post*, March 23, 2003, pp. A1 and A10.

¹⁸ The most well known and oft-cited example is Secretary of Defense William Cohen's 1997 interview with ABC News, where he held up a five-pound bag of sugar and speculated that this amount of anthrax spores could wipe out Washington, D.C. "Interview with William Cohen," *ABC This Week*, November 16, 1997, Transcript #97111604-j12, transcribed by the Federal Document Clearing House, Inc., (New York, New York: American Broadcasting Co., 1997).

¹⁹ See Amy E. Smithson and Leslie-Anne Levy, "Grounding the Threat in Reality," Chapter 2 of *Ataxia: The Chemical and Biological Terrorism Threat and the US Response*, Report No. 35, Henry L. Stimson Center, Washington, D.C., 1999, pp. 11-69; accessed at [<http://www.stimson.org/cbw/pubs.cfm?id=12>].

Possible Reasons Against Terrorist Use

There are at least four reasons why terrorist groups like Al Qaeda might avoid using chem-bio agents in attacks against the United States and its interests. First and most important, the technical difficulties in carrying out such attacks continue to be significant. Aum Shinrikyo is a good example of a group that had unusually favorable circumstances for producing chemical and biological weapons, including money, facilities, time and expertise, yet they were unable to do so effectively. Some experts argue that Aum Shinrikyo's experience, which included problems ranging from obtaining biological seed cultures to effectively disseminating them to chemical leaks and accidents, is as easily a warning of the technical challenges involved as it is an example for future groups.²⁰ For most nonstate actors, difficulties with acquiring materials, maintaining them, transforming them into weapons, and disseminating them effectively are numerous. While many technical advances have occurred in recent years, arguably reducing the barriers somewhat, there are still considerable obstacles to terrorist development of chemical and biological weapons.²¹

Second, as mentioned above, there are far easier and potentially more "effective" (at least in terms of casualty numbers) alternatives to chemical and biological weapons. On the rare occasions when they have been used, CBW have not resulted in large death tolls, especially compared to conventional weapons such as truck bombs and individual explosive devices.²² It is worth bearing in mind that the attacks of September 11th accomplished mass destruction without any unconventional weaponry. If measured strictly in terms of their proven capacity to kill people or the frequency of terrorist use in the past, CBW weapons are not the most worrisome threat.

Third, the incentives and disincentives for individual terrorists to use chemical and biological weapons are complex and may not be exactly the same as those that guide the use of more conventional weapons. Recent suicide attacks indicate, among other things, an apparently growing willingness on the part of terrorist organizations to plan and condone the death of their own operatives in the service of the cause. It is difficult to handle many chemical and biological agents without putting the handler at risk, especially in the absence of the kind of top-quality equipment that is more commonly available to states. But instantaneous death in a dramatic explosion is a far cry from the agony of a slow death from smallpox or exposure to a nerve agent. Of course, there are many unknowns; but from an individual perspective, the incentives and disincentives for dying in a CBW attack should not be assumed to be the same as those that factor into other types of attacks. Indeed, the existence of

²⁰ See Smithson and Levy, "Rethinking the Lessons of Tokyo," Chapter Three, *Ibid.*, pp. 71-111.

²¹ For much more information on this, see CRS Report RL31669, *Terrorism: Background on Chemical, Biological, and Toxin Weapons and Options for Lessening Their Impact*, by Dana Shea.

²² According to Smithson and Levy, the largest death toll resulting from a single CBW attack was 19, and in 96 percent of the cases three or fewer people were either injured or killed. *Ataxia*, p. xiii.

larger numbers of religious terrorists could actually imply a *decreased* likelihood of the use of chemical and biological weapons. Although this point should not be overstated, violence whose primary aim is to kill as many perceived enemies as possible may not be likely to employ these agents. It is difficult in most scenarios to execute an attack with chem-bio weapons that kills a large number of people.

Finally, groups tend to mimic previous successes. Although terrorists do innovate in various ways,²³ groups have most often preferred to use weapons that have a proven track record. There are no guarantees, but going strictly on the odds and the historical patterns of terrorist behavior, most experts posit that there is a higher likelihood that the next major attack will use conventional not unconventional means. But, again, the caveat is that terrorism seeks to shock.

Issues for Congress

If a chemical or biological terrorist attack were to occur, it is most likely that the event would be on a small scale physically, with much larger effects on the population psychologically. For this reason, targets of terrorism are forced to seek a fine balance: On one hand, it is important to prepare the public for the possibility of an attack. Among other things, since one of the incentives for using these weapons is to induce panic, preparations lower the likelihood of their occurrence in the first place. On the other hand, hyping and publicizing the threat potentially distorts its probable magnitude and likelihood. This could arguably add to the incentives for a terrorist organization to attempt an attack.

Additional measures to counter both state and especially non-state means of proliferation of chemical and biological weapons are crucial to reducing the threat in the future, both domestically and internationally. This is a difficult technical challenge in an age of globalization, when the expertise and means to carry out attacks are becoming much harder to control through traditional state measures like border controls, export controls, treaties and sanctions. Defensive measures and consequence management to reduce both the effects of an attack and the incentives to carry one out will be increasingly important. Within the United States, some measures enhancing the security of laboratories/facilities have already been enacted.²⁴ Some believe that existing measures are adequate, and others disagree.

With respect to the increasing global availability of information and materials related to chemical and biological weapons, an important issue could be the fate of the people who have worked in the Iraqi weapons programs. At this writing, the full nature of those programs is not publicly known; however, as the United States forcibly disarms Iraq, it could become critical to ensure that CBW materials and

²³ See Paul Wilkinson, "Editor's Introduction: Technology and Terrorism," in *Technology and Terrorism* (London, England: Frank Cass, 1993), pp. 1-11. Among terrorism experts, the question of how terrorists use technology, especially the degree to which they innovate technologically, is complex and contentious.

²⁴ For example, see the USA PATRIOT Act (P.L. 107-5) and the Public Health Security and Bioterrorism Preparedness and Response Act (P.L. 107-188).

expertise are not disseminated during and after military operations. This is a potential danger not only with respect to keeping track of the whereabouts and behavior of the scientists who have been in charge (and may have already been identified by UNMOVIC and/or U.S. intelligence) but also the production-level technicians and others who may have access or some degree of knowledge.

At least in the short term, the nightmarish scenario of loss of control of Iraqi CBW, including potential sale or transfer to terrorist organizations, could arguably be more likely in an atmosphere of political or economic instability. There might be incentives for new links to develop between Iraqis who might have benefitted from the previous regime, and well-heeled groups like Al Qaeda (and its associates). Osama bin Laden's expression of support for the Iraqi people (if not the Ba'athist regime), as well as evidence of Al Qaeda's existing interest and capabilities, argue for scrupulous caution along these lines. There have been extensive measures under the Nunn-Lugar Comprehensive Threat Reduction program oriented toward the arsenal of the former Soviet Union, but a post-conflict Iraq could present important new proliferation risks. Existing legislation, including the Iraq Sanctions Act of 1990 and existing provisions under the Chemical Weapons Convention and the Biological and Toxin Weapons Convention, may not adequately address this new concern,²⁵ and additional measures targeting this emerging danger may be worth considering.

²⁵ For more information, see CRS Report RL31502, *Nuclear, Biological, Chemical and Missile Proliferation Sanctions: Selected Current Law*, by Dianne E. Rennack, and CRS Report RL31559, *Proliferation Control Regimes: Background and Status*, by Sharon A. Squassoni, Steven R. Bowman, and Carl E. Behrens.