

Chapter 1

Introduction

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The last time Americans were so thoroughly unhinged by something from Tokyo was 1954, when up on the silver screen Japanese soldiers battled a giant celluloid lizard fictitiously born out of a US nuclear test.¹ The most recent Japanese horror import is imminently more believable because it is the outgrowth of a real event, a deluded religious sect's poison gas attack against Tokyo subway commuters on 20 March 1995. Terrorists packing guns and bombs are frightening enough, but chills go down the spine at the thought of indiscriminate killers employing weapons that at times cannot be seen, heard, smelled, or tasted: arbitrary death from an imperceptible cause is a nightmare if ever there was one.

Apprehension began building in the United States after the Aum Shinrikyo cult upset the conventional wisdom that the possession and use of weapons of mass destruction was the province of governments alone. This cult's shocking attack was proclaimed the dawn of a new age "catastrophic" terrorism involving chemical, biological, and nuclear weapons. According to a trio of former senior government officials, including one of cabinet rank, "Experts combining experience in every quadrant of the national security and law enforcement community all consider this catastrophic threat perfectly plausible today."² Talk of unconventional terrorism spilled from academic and government circles to Hollywood, which was unable to resist a plot line as juicy as terrorists menacing Metropolis, USA, with chemical or biological weapons.³ Novelists found the subject just as enticing.⁴ In fact, it was the novel *Cobra Event* that caught the eye of President Clinton, who subsequently told the *New York Times* that he was so worried about

¹ In the first three films of the Godzilla series, the monster destroys Tokyo repeatedly, flattening Osaka and various smaller Japanese towns along the way. Subsequently, Godzilla battles a variety of enemies—a big black chicken, a giant cockroach, a smog monster, an oversized crab, a mechanical version of himself—to save the planet. In the ninth film, however, aliens program Godzilla and his fellow monsters to obliterate capitols around the globe. The film series also features the Son of Godzilla, a giant moth named Mothra, and Gamera, a giant prehistoric turtle awakened by the make-believe crash of a nuclear-armed aircraft. Godzilla and other monster films in Japan have often reflected larger Japanese societal concerns, from nuclear weapons to pollution to over-mechanization. For more on these films, see Phil Hardy, *The Encyclopedia of Science Fiction Movies* (London: Aurum Press, 1984).

² Ashton B. Carter, John M. Deutch, and Philip D. Zelikow, *Catastrophic Terrorism: Elements of a National Policy*, Stanford-Harvard Preventive Defense Project 1, no. 6 (Stanford, Calif.: Stanford University; Cambridge, Mass: Harvard University, 1998), 2. Italics in the original. Elsewhere, this group advised: "The danger of weapons of mass destruction being used against America and its allies is greater now than at any time since the Cuban missile crisis of 1962." Ashton B. Carter, John M. Deutch, and Philip D. Zelikow, "Catastrophic Terrorism: Tackling the New Danger," *Foreign Affairs* 77, no. 6 (November/December 1998): 81.

³ Cases in point include 1995's *Outbreak* and *Bullet to Beijing*; 1996's *The Rock*, *Executive Decision*, and *The Long Kiss Goodnight*; 1997's *Face/Off*; 1999's *Chill Factor*; and 2000's *Mission: Impossible 2*.

⁴ See, for example, Tom Clancy's *Executive Orders* (New York: G.P. Putnam's Sons, 1996), and Robin Cook's *Contagion* (New York: G.P. Putnam's Sons, 1995) and *Vector* (New York: Putnam Publishing Group, 1999).

unconventional terrorism that it caused him sleepless nights: “[I]f the issue is, is it a near certainty that at some time in the future there will be some group, probably a terrorist group, that attempts to bring to bear either the use or the threat of a chemical or biological operation, I would say that is highly likely to happen sometime in the next few years.”⁵ That presidential pronouncement accompanied new White House initiatives to prepare the country for this novel form of terrorism, augmenting considerable efforts that were already underway.

Actually, the first prominent policy makers to speak out on the implications of Aum Shinrikyo’s sarin attack were Senators Sam Nunn (D–Georgia, ret.) and Richard Lugar (R–Indiana), who are to be credited for investigating the cult’s activities and, along with Senator Pete Domenici (R–New Mexico), kicking off some pointed federal programs to help rescuers in the nation’s 120 largest cities better deal with unconventional terrorism.

- * “The case of Aum can provide us with many instructive lessons about weapons proliferation, about the capabilities and limitations of intelligence and law enforcement, and about the adequacy of our medical and civil preparedness.”—Senator Sam Nunn⁶
- * “Domestically, we here in the United States are not equipped to manage the crisis posed by the threatened use of [unconventional] weapons or to manage the consequences of their use against civilian populations. . . . That preparation must take the form of help to local ‘first responders’—the firemen, police, emergency management teams, and medical personnel who will be on the front lines if deterrence and prevention of such incidents fail.”—Senator Richard Lugar⁷

As the body of this report underscores, it is one thing to recognize a threat to the security and safety of Americans and have the good sense and initiative to insist that the country address it. Having that good idea implemented in a competent, coherent, and cost-effective manner is another thing entirely.

⁵ President William J. Clinton, “Interview of the President by the New York Times” (Washington, DC: White House Office of the Press Secretary, 23 January 1999). On Clinton’s reading of Richard Preston’s *Cobra Event*, see Judith Miller and William J. Broad, “Exercise Finds US Unable to Handle Germ War Threat,” *New York Times*, 25 April 1998. Earlier, Clinton stated: “In light of what happened in Japan, all advanced countries should be very, very concerned about the prospect of the merger of terrorism and weapons of mass destruction. . . .” “Transcript of Remarks by President Clinton and President Yeltsin in a Joint Press Conference Today in Moscow,” *US Newswire*, 10 May 1995.

⁶ Statement of Senator Sam Nunn, US Senate, Committee on Governmental Affairs, Permanent Subcommittee on Investigations, *Global Proliferation of Weapons of Mass Destruction*, Part I, 104th Cong., 1st sess., 1 November 1995 (Washington, DC: US Government Printing Office, 1996), 151.

⁷ Senator Richard Lugar, “Remarks on the Terrorist Threat,” speech presented at Jane’s Information Group Conference on Countering Chemical and Biological Weapons: Government Programs, Industry Opportunities, 19 November 1997, Washington, DC.

Following the November 1995 Senate hearings on global proliferation of weapons of mass destruction and possible implications for terrorist activities, government agencies started coming out of the woodwork to assert their capabilities and missions pertaining to unconventional terrorism response. In the late 1990s Washington was awash with cabinet officers and elected officials issuing warnings about the problem, a familiar sign that a competition for federal funds was afoot:

- * “With advanced technology and a smaller world of porous borders, the ability to unleash mass sickness, death, and destruction today has reached a far greater order of magnitude. A lone madman or a nest of fanatics with a bottle of chemicals, a batch of plague-inducing bacteria, or a crude nuclear bomb can threaten or kill tens of thousands of people in a single act of malevolence. These are not far-off or far-fetched scenarios. They are real—here and now.”—Secretary of Defense William S. Cohen⁸
- * “The acquisition, proliferation, threatened or actual use of weapons of mass destruction by a terrorist group or individuals constitutes one of the gravest threats to the United States.” —Federal Bureau of Investigation Director Louis J. Freeh⁹
- * “Perhaps most worrisome, we have seen in the last year growing indications of terrorist interest in acquiring chemical, biological, and nuclear weapons.”—Central Intelligence Agency Director George J. Tenet¹⁰
- * “The potential for a [chemical or biological weapons] attack against the United States represents one of the principal national security threats to our country in the 21st century.”—Senator Jon Kyl (R–Arizona)¹¹

⁸ “Message of the Secretary of Defense,” in *Proliferation: Threat and Response* (Washington, DC: US Department of Defense, November 1997), iii. Cohen’s op-ed on the topic was equally ominous. “A plague more monstrous than anything we have experienced could spread with all the irrevocability of ink on tissue paper. Ancient scourges would quickly become modern nightmares.” William Cohen, “Preparing For a Grave New World,” *Washington Post*, 26 July 1999.

⁹ Statement of FBI Director Louis J. Freeh, US Senate, Committee on Appropriations, *Special Hearing on Counterterrorism*, 105th Cong., 1st sess., 13 May 1997 (Washington, DC: US Government Printing Office, 1998), 16.

¹⁰ Testimony of George J. Tenet, US Senate, Select Committee on Intelligence, *Hearing on Current and Projected National Security Threats*, 105th Cong., 2nd sess., 28 January 1998 (Washington, DC: US Government Printing Office, 1998), 14.

¹¹ Senator Jon Kyl, prepared statement before the Senate Judiciary Committee and Select Intelligence Committee, 105th Cong., 2nd sess., 22 April 1998.

- * “Terrorism is no longer something that we read about happening in foreign lands. It is a real threat and our vulnerabilities are real here, particularly against chemical and biological weapons.”—Senator Carl Levin (D–Michigan)¹²
- * “[W]e have seen terrorism emerge as one of the thorniest problems of the post-Cold War era. We have seen that terrorists are always searching for new weapons, and we have already seen sarin nerve gas released in the Tokyo subway. It may not happen immediately, but somewhere, sometime in the future, terrorists may well threaten to use or attempt to use a biological weapon against the United States.”—Secretary of Health and Human Services Secretary Donna Shalala¹³

These statements conveyed an impending doom that left some perplexed. What had changed so dramatically overnight to warrant such alarm about unconventional terrorism? The technologies and know-how to make chemical and biological weapons were no more available to terrorists on 21 March 1995 than on 19 March 1995. Terrorism has been around for many a century, and while there were lessons to be learned from Aum Shinrikyo’s attack, it was somewhat rash to project that terrorists henceforth would embrace unconventional weapons, particularly when the regular tools of their trade are much easier to acquire and use, and serve their purposes equally well. Chicken Little statements are better for scaring up money than forming sound public policy.

As both programs to aid front-line responders and a rash of anthrax hoaxes crossed the country, local media avidly covered the story anew. Denizens of Cleveland and Baltimore, Sarasota and Norfolk, Salt Lake City and Worcester, Massachusetts, were treated to the lurid details of how their city could soon be stricken with this disease or that toxic gas, inevitably accompanied by a quote from someone stating how easy it would be for terrorists to perpetrate this type of attack.¹⁴ This saturated coverage and all of the ominous

¹² Senator Carl Levin, prepared statement before the Senate Judiciary Committee and Select Intelligence Committee, 105th Cong., 2nd sess., 22 April 1998.

¹³ Donna Shalala, “Bioterrorism: How Prepared Are We?” *Emerging Infectious Diseases* 5, no 4. (July/August 1999): 492–3.

¹⁴ “On Thursday night at 8, a cloud of fine white powder will be released into an Old Dominion University auditorium. If all goes as planned, a large audience will breathe the powder; particles will settle on their skin. Within seconds the dust will be sucked into air vents and then blown into every corner of the building, ‘infecting’ every human inside. The powder at ODU will be harmless. But bestselling author Richard Preston will use it to illustrate how quickly a deadly chemical weapon can be dispersed.” Lorraine Eaton, “Author to Give Germ-Warfare Talk at ODU,” *The Virginian-Pilot*, 7 April 1999. “Biological weapons kill, too. In a slower and nastier way. And, they spread from person to person. They keep on killing. The right bioweapon, released in the right way at the right place, could just about wipe out the population of a city, or a nation, or a planet.” Waldo Proffit, “Wishing Against Biological Warfare,” *Sarasota Herald-Tribune*, 1 April 1998. “Domestic terrorism involving chemical or biological weapons is likely to occur because of various factors, Moon said, including the enhanced accessibility of technology and an active black market in such weapons.” Ian Donniss, “Professor Sounds Alarm on Chemical Weapons,” *Worcester Telegram & Gazette*, 27 August 1998. Also, John Mangels, “Scientists Try to Counter Bioweapons,” *Plain Dealer*, 23 November 1998; Joe Bauman, “US Falls Short in Anti-terrorist Preparedness,” *Deseret News*, 29 April 1998; Tom Bowman, “US Lacks a Broad Plan to Combat Bioterrorism” *Baltimore Sun*, 16 January 2000.

forecasts from Washington took their toll on the American psyche. According to a survey published in 1999, 84 percent of Americans viewed international terrorism as the most serious threat facing the country. Chemical and biological weapons were the second most feared threat, according to 76 percent of those queried.¹⁵

Moreover, Washington's response to the problem took its toll on the American pocketbook. Public officials both pumped and rode the swell of anxiety, sending a slice of the federal counterterrorism budget to organizations back home and countless government agencies. In 1998, the federal budget for combating unconventional terrorism was \$645 million, rising to \$1.5 billion in 2000. The overall counter-terrorism budget in 1996 was \$5.7 billion, versus \$10.2 billion in 2000.¹⁶ US citizens would assume that somewhere between 1995 and 2000, Washington policy makers had done some fundamental thinking about the purpose and effectiveness of these programs.

Taxpayers might also expect that officials had agreed upon a definition of the problem, measures of performance for government programs, and overall program objectives. Instead, Congress buckshot funds to dozens of government agencies, several of which were pushing their own agendas to the detriment of a coordinated federal effort and wise spending of taxpayer dollars. To illustrate the point, by mid-2000, seventy-six cities had received federal training and assistance but had no firm idea as to what standards of unconventional terrorism preparedness they should be striving to meet.¹⁷ Late in the summer of 2000, there seemed to be no end in sight to the proliferation of federal programs. Coordination and efficiency were still taking a backseat to interagency jockeying for control over this or that portion of terrorism preparedness programming. Americans deserve better.

US citizens also count on their government to address real problems, not manufactured ones. A number of countries are known to harbor genuine chemical and biological warfare capabilities.¹⁸ The

¹⁵ This fall 1998 Chicago Council on Foreign Relations survey interviewed more than 1,500 people. See John Rielly, "Americans and the World: A Survey at Century's End," *Foreign Policy*, no. 114 (Spring 1999): 99; John Rielly, ed. *American Public Opinion and US Foreign Policy 1999* (Chicago: Chicago Council on Foreign Relations, 1999). The survey is available in its entirety at <http://www.c CFR.org/publications/opinion/opinion.html>. See also Leonard A. Cole, "Risks of Publicity about Bioterrorism: Anthrax Hoaxes and Hype," *American Journal of Infection Control* 27, no. 6 (December 1999): 470-3.

¹⁶ The 2000 combating terrorism budget includes nearly \$7 billion for defense against conventional terrorism, \$1.5 billion specifically for unconventional terrorism, and \$1.8 billion for protection of critical infrastructures. Executive Office of the President, Office of Management and Budget, *Annual Report to Congress on Combating Terrorism*, Pursuant to Public Law 105-85, 18 May 2000, 45, 59; Michael Dobbs, "An Obscure Chief in US War on Terror," *Washington Post*, 2 April 2000.

¹⁷ A running list of the cities trained can be found on the Soldier and Biological Chemical Command website at: <http://www.sbccom.apgea.army.mil>.

¹⁸ See, for example, US Arms Control and Disarmament Agency, *Adherence to and Compliance with Arms Control Agreements* (Washington, DC: US ACDA, 1998); US Senate, Committee on Governmental Affairs, *Proliferation Threats of the 1990's*, 103rd Cong., 1st sess. 24 February 1993 (Washington, DC: Government Printing Office, 1995); US Department of Defense, Office of the Secretary of Defense, *Proliferation: Threat and Response* (Washington, DC: US Department of Defense,

minute the US government had knowledge that another nation had not only weaponized contagious biological agents (e.g., smallpox, plague, Marburg), but also had a doctrinal concept of attacking an opponent's civilian populace, then it was incumbent upon Washington to throw US biodefense programming into high gear to safeguard the health of soldiers and civilians alike.¹⁹ Confirmation of the US government's intelligence about the Soviet biowarfare program began with high-level defections in the late 1980s and early 1990s, yet Washington did not escalate efforts to develop new licensed vaccines and stockpile existing vaccines until 1996 and 1998, respectively.²⁰ Nor did the government make any move to resuscitate the country's long-neglected disease surveillance system until 1998. What little has been done to improve the nation's biodefenses has to a large extent ridden the coattails of bioterrorism concerns. Some good things, in other words, have been accomplished under the banner of unconventional terrorism preparedness programming.

This set of circumstances is emblematic of what ails US unconventional terrorism programs. Real problems and solutions have been attended to tangentially and half-heartedly while mega-millions have been spent on efforts that have little chance of saving lives should a government or terrorist group actually attack US citizens with biological or chemical agents. The bottom line: US unconventional terrorism preparedness programming could benefit from a major overhaul.

PURPOSE, ORGANIZATION, AND METHODOLOGY OF THE REPORT

As one analyst observed, "Television interviews where public officials describe how many people a vial of anthrax will kill terrify, but do they enlighten?"²¹ True, major features of modern

1997); United Nations, *Report of the Secretary-General on the Status of the Implementation of the Special Commission's Plan For the Ongoing Monitoring and Verification of Iraq's Compliance With Relevant Parts of Section C of Security Council Resolution 687 (1991)*, S/1995/864 (New York: United Nations, 11 October 1995).

¹⁹ Among those arguing for stronger programs to cope with the possible release of smallpox are Dr. Michael Osterholm, previously the state epidemiologist of Minnesota, and Dr. D.A. Henderson, who oversaw the global eradication of smallpox in 1977. This pair's smallpox concerns can be found in several places, including Michael T. Osterholm and John Schwartz, *Living Terrors* (New York: Random House, 2000) and D.A. Henderson, "Bioterrorism as a Public Health Threat," *Emerging Infectious Diseases* 4, no. 3 (July/September 1998): 488–92. Among those issuing reminders that the problem lies much more at the state level than at the sub-national actor level is Dr. Seth Carus. See, for example, W. Seth Carus, testimony before the House Committee on Government Reform, Subcommittee on National Security, Veterans Affairs, and International Relations, 106th Cong., 2nd sess., 26 July 2000.

²⁰ The first high-level defector from the USSR's program was Dr. Vladimir Pasechnik, who left Leningrad's Institute of Ultra-Pure Biopreparations in 1989 for the United Kingdom. Three years later, the deputy director of Biopreparat, Dr. Ken Alibek, defected to the United States. The release of Alibek's book, with its revelations of Soviet stockpiling of contagious agents and counter-civilian biowarfare doctrine, made public what the government had known for quite some time. Ken Alibek with Stephen Handelman, *Biohazard* (New York: Random House, 1999). As discussed in chapter 7, the Defense Department launched the Joint Vaccine Acquisition Program in 1996. The 1998 decision to create a national pharmaceutical stockpile is addressed in chapter 4, the stockpile's role and attendant problems in chapter 6.

²¹ David C. Rapoport, "Terrorism and Weapons of the Apocalypse," *National Security Studies Quarterly* V, no. 3 (Summer 1999): 60.

society—skyscrapers, sporting arenas, amusement parks, mass transit, and the like—are by their nature open to terrorist attack. Moreover, the chemical and biological weapons options available to terrorists would appear to be abundant. However, when discussion of the problem of chemical and biological terrorism is dominated by scary what-if scenarios almost to the exclusion of technical and historical analysis, poor public policy results.

A principal purpose of this report is to inject an appreciable dose of pragmatism into the what-if frenzy over the chemical and biological terrorism threat and the attendant federal programs. One wonders for example, if those who speak so alarmingly about this threat are aware that in the last century not a single American died as a result of bioterrorism and only one US citizen perished in a terrorist assassination involving a chemical agent.²² Do those who opine about the unconventional terrorism threat know or appreciate that amassing from scratch a genuine mass casualty capability with poison gas or germ weapons is not exactly a snap? In short, some perspective is needed to cut through what one author, playing off of the adage about the “fog of war,” has termed the “dense ‘smog of terrorism.’”²³

The pragmatism in the next chapter of the report comes from world-renowned experts in terrorist behavior and historical databases on terrorist activities, as well as from those who have extensive knowledge in the manufacture and dissemination of chemical and biological agents. Chapter 2 delves into the changing nature of terrorism and the technical challenges of acquiring and effectively dispersing chemical and biological agents. The third chapter is devoted to the events surrounding Aum Shinrikyo, the taboo-busting case that prompted US unconventional terrorism preparedness programs in the first place. Gross misperceptions persist about Aum Shinrikyo’s chemical and biological weapons prowess, so chapter 3 dissects the cult’s weapons programs and examines as well the rescue efforts mounted after Aum’s sarin attacks, seeking lessons to inform US preparedness programs.

Chapter 4 addresses just how many federal agencies have wrapped themselves in the mantle of chemical and biological terrorism preparedness and response programs. Far too frequently, Washington started new response units instead of examining the sufficiency of existing capabilities and then building upon them, if needed. New training and research centers dot the country, each touting its own niche. Stimson Center Research Associate Leslie-Anne Levy maps out the federal programs and the reasons behind this less than cost-effective approach.

²² In 1973, the Symbionese Liberation Army assassinated a school superintendent in Oakland, California with a bullet tipped with cyanide. Jonathan B. Tucker and Amy Sands, “An Unlikely Threat,” *Bulletin of the Atomic Scientists* 55, no. 4 (July/August 1999): 46, 48.

²³ According to Stephen Sloan, “If there is a ‘fog of war,’ there is probably a more dense ‘smog of terrorism.’” Stephen Sloan, “Terrorism: How Vulnerable is the United States?” in *Terrorism: National Security Policy and the Home Front*, ed. Stephen C. Pelletiere (Strategic Studies Institute, US Army War College, 1995), 51.

Much of the pragmatism in chapters 5, 6, and 7 comes directly from rescuers and health care personnel who face emergencies and save lives on a daily basis. In February 1999, Amy E. Smithson, the director of the Stimson Center's Chemical and Biological Weapons Nonproliferation Project and the report's principal author, began crisscrossing the country to interview public safety and health care providers about their experience with the federal programs—good, bad, or indifferent. Accordingly, chapter 5 presents their evaluations of the federal training and equipment grant programs. What these first responders and health care providers say in this chapter and the next should remove any illusions held by policy makers in Washington or in the recipient cities about the ease of preparing for this type of disaster as well as the current status of preparedness in cities across the land.

Chapter 6 presents chronological descriptions, built upon these interviews, of the caliber of response a large US city that has received federal aid is likely to muster in the event of a chemical or biological terrorist attack causing mass casualties. This chapter identifies a few response areas where local personnel can begin to contend with this type of calamity, but large segments are devoted to response areas where cities are still struggling to put coordination mechanisms, plans and tactics, and capabilities in place. The cities are laboring with common response problems, and this chapter features practical solutions that some cities have crafted. Accordingly, chapter 6 may provide helpful ideas for emergency personnel who are trying to move preparedness programming forward in their cities. From both the text and the interviewees' own ratings of their preparedness status, federal and local policy makers will gain a better understanding of just how far those on the front lines have yet to go before they believe they are ready to respond effectively to a major chemical or biological terrorism attack.

As is customary, the final chapter of the report contains observations and conclusions drawn from the preceding research. Some recommendations come directly from the personnel on the front line, others from the project staff's analysis.

By choice, this report leaves aside the issue of terrorist acquisition and use of radiological devices or nuclear weapons. The topic of "loose nukes" garnered a significant amount of attention in the aftermath of the USSR's collapse, but attempts to smuggle nuclear materials out of the former Soviet states have been quashed.²⁴ Also, terrorists have not been nearly as active with nuclear materials as they have with chemical

²⁴ For a discussion of the "loose nukes" problem, see Graham T. Allison et al., *Avoiding Nuclear Anarchy: Containing the Threat of Loose Russian Nuclear Weapons and Fissile Material* (Cambridge, Mass.: MIT Press, 1996); Oleg Bukharin and William Potter, "Potatoes Were Guarded Better," *Bulletin of the Atomic Scientists* 51, no. 3 (May/June 1995): 46–50; Rensselaer Lee, "Smuggling Update," *Bulletin of the Atomic Scientists* 53, no. 3 (May/June 1997): 52; Paul Mann, "Clinton Upbraided On 'Loose Nukes,'" *Aviation Week and Space Technology* 147, no. 14 (6 October 1997): 45.

and biological substances.²⁵ Finally, as indicated by the title of the Chemical and Biological Weapons Nonproliferation Project, matters pertaining to nuclear weapons are outside of the project's portfolio.

Furthermore, the report does not dwell on a known viable threat, the chemical and biological weapons programs of various nations. Government weapons programs, which in the biological area have devoted considerable effort not just to anti-human but to anti-crop and anti-livestock agents as well, are discussed only with regard to whether nations would assist terrorist acquisition of these weapons. Focusing on terrorism's human targets, the report also leaves aside the issue of whether terrorists might use unconventional weapons against crops and livestock. Such sabotage would have huge economic ramifications, and this particular problem rightfully garnered government attention and funding in the late 1990s.²⁶

As noted, front-line interviews with rescuers and health care personnel are a principal source of data for this report. Interviews were conducted with individuals from over thirty US cities located just about as far north, south, east, and west as one can go, as well as numerous midway points. Those interviewed included fire fighters, hazardous materials specialists, bomb technicians, city emergency personnel, public health department staffers, paramedics, special operations police, nurses, physicians, hospital administrators, and disaster response coordinators. In addition, personnel from state-level emergency offices were interviewed. The Stimson Center is grateful to those who shared their time and insight and has agreed to cite these interviews by job title alone. Unless otherwise noted as affiliated with a state or county organization, interviewees were working within a city context. A few individuals gave express permission for the Stimson Center to identify a city and a point of contact. Officials in the various federal programs were also interviewed and are identified in a generic fashion. Technical specialists in several disciplines associated with chemical and biological weaponry graciously shared their knowledge as well. Some are identified by name, others by area of expertise.

²⁵ The most prominent incidence of nuclear terrorism was in November 1995, when Chechen separatists observed the first anniversary of the outbreak of hostilities with Russia by threatening to explode radiological devices in Moscow. At Ismailovsky Park, a popular flea market for tourists and locals alike, authorities recovered 70 pounds of cesium-137, a radioactive material that cannot sustain a nuclear chain reaction. Michael Spector, "Chechen Insurgents Take Their Struggle to a Moscow Park," *New York Times*, 24 November 1995.

²⁶ The costs of a terrorist attack on the US food supply should not be underestimated. A natural outbreak of pathogenic avian influenza in Pennsylvania during the early 1980s forced the US government to slaughter all infected chickens and decontaminate facilities at a cost of \$63 million. Had the government opted against the depopulation and cleanup, the tab was estimated at \$5.6 billion. See Corrie Brown, College of Veterinary Medicine, University of Georgia, testimony before the Senate Armed Services Committee, Subcommittee on Emerging Threats, 106th Cong., 1st sess., 27 October 1999. The Department of Agriculture enhanced its unconventional terrorism efforts, primarily through specialized research centers that study highly infectious diseases in animals. For example, the agency proposed upgrades at its Plum Island Animal Disease Center off the coast of Long Island. The 2001 budget request also included funding to bolster the National Animal Disease Center in Ames, Iowa. See Judith Miller, "Administration Plans to Use Plum Island to Combat Terrorism," *New York Times*, 21 September 1999; Steve Goldstein, "Plant Scientists Sound the Alarm On Agroterrorism," *Philadelphia Inquirer*, 13 September 1999; Steve Goldstein, "US Could Face New Terror Tactic: Agricultural Warfare," *Philadelphia Inquirer*, 22 June 1999.

The study also benefitted from the database on chemical and biological terrorism maintained by the Center for Nonproliferation Studies at the Monterey Institute of International Studies, which provided information for the analysis presented at the close of chapter 2. Other databases, case histories, technical studies, reports, books, and articles were also consulted, as the text and footnotes reflect. All totaled, the report draws upon over 400 print sources and 135 interviews.