

Unit II

Weapons and Motivations

Our understanding of the WMD terrorism threat requires a recognition of how different types of chemical, biological, radiological and nuclear (CBRN) weapons have different levels of appeal to terrorist groups as well as different levels of difficulty in cost and production, potential effectiveness, and means of protection. Unit two of this volume thus offers detailed accounts of the characteristics, availability, and dangers of CBRN weapons, along with case studies that associate theory with practice—an important feature of this volume. Each of the following four sections begins with a brief fact summary developed by the National Academies and the Department of Homeland Security (DHS), offering important basic information required by all students of the WMD terrorist threat. These are followed by selections that offer rich, scholarly perspectives on a specific category of weapon.

Chemical

The first part of this unit examines the threat of chemical terrorism. After the brief overview provided by the National Academies and DHS, Jonathan Tucker's article assesses the threat of chemical terrorism and examines strategies for prevention and response. Tucker identifies four primary types of threat: release of a military-grade chemical warfare agent against a civilian target; sabotage of a chemical manufacturing plant or storage facility; contamination of public water or food supplies; and targeted use of a chemical agent to assassinate specific individuals. He notes that most incidents of chemical terrorism have involved the use of household or industrial chemicals, but that the sabotage of a commercial chemical plant or a series of railroad tank cars could be catastrophic and more likely than the large-scale release of a military nerve agent. Thus, he calls for improving the security of chemical plants and the transportation infrastructure, which will require greater cooperation between government and the private sector.

Biological

The second part of this unit offers three perspectives on the critical threat of bioterrorism. Following the National Academies and DHS fact summary, a history of biological weapons is provided by James Martin (a Colonel in the U.S. Army Medical Corps), George Christopher (a Lieutenant Colonel in the U.S. Air Force Medical Corps) and Edward Eitzen (former Commander of the U.S. Army Medical Research Institute of Infectious Diseases). They describes how the history of state-sponsored biological weapons programs is obscured by secrecy, propaganda, and a lack of rigorous microbiologic or epidemiological data to confirm allegations of use. Further, biological weapons programs have been renounced by over 40 signatory states to the Biological Weapons Convention for numerous political and strategic considerations. Yet, as demonstrated in October 2001, we must be prepared for the possibility that some non-state actor (a terrorist group or even a deranged individual) may intentionally release a lethal pathogen in the hopes of indiscriminately killing scores of innocent civilians. Responding to this threat requires coordination among local and federal intelligence, law enforcement, public health, and medical professionals.

Next, Brian Finlay of the Stimson Center describes how new biotechnologies have brought tremendous benefits for health and economic development, and yet their inherent “dual-use” potential also makes them attractive to those who seek to do harm. As a result, the fundamental challenge of the biotech revolution is to ensure that dual-use knowledge and technologies with a clearly legitimate use in the civilian economy are neither inhibited by overly invasive legal restrictions on their discovery, use, and dissemination, nor diverted for nefarious use as bioweapons. And in the final selection on the bioterror threat, Benjamin Wittes of the Brookings Institution echoes these concerns and then addresses the legal and ethical implications of potentially controversial government responses to this threat. He concludes with some recommendations for how researchers and technology can help address some of the most pressing concerns of the threat posed by modern and future biological weapons.

Radiological

In the third part of this unit, we examine the threat of radiological terrorism. Following the National Academies and DHS fact summary, Charles Ferguson of the Federation of American Scientists and Michelle Smith of the Council on Foreign Relations provide a detailed analysis of these weapons, their effects, and the kinds of potential attacks in which they could be used. They note an attack using radiological materials

(a so-called “dirty bomb” attack) would require technical, logistical, and financial means beyond those needed for terrorism using conventional methods. Following a summary of the commercially available radioactive sources, dispersal methods, and exposure pathways that could be deployed in a radiological attack, the authors assess various attack scenarios and draw conclusions for how to prevent such an attack. The authors also illustrate the need to secure the sources of radiation that could be used to develop a radiological dispersal device.

Nuclear

The fourth part of this unit addresses the worst of all WMD scenarios—a terrorist attack using a nuclear weapon. Following the National Academies and DHS fact summary, Morten Bremer Maerli (of the Norwegian Institute of International Affairs), Annette Schaper (of the Peace Research Institute Frankfurt) and Frank Barnaby (of the Oxford Research Group) provide some observations on the likelihood of nuclear terrorism and on the technical feasibility of crude nuclear weapons production. Of particular importance, they illustrate how the production obstacles may be lower than anticipated and that technical barriers should not be regarded as sufficient to avoid nuclear terrorism in the future. They conclude that preventing any extremist group from achieving their goals of large-scale nuclear violence can best be done by denying them access to highly enriched uranium or plutonium, the essential ingredients of any nuclear device, and that adequate protection and control of such materials is thus vital.

Next, Matthew Bunn and Anthony Wier of the Managing the Atom Project at Harvard University identify seven misconceptions about the threat of nuclear terrorism and how governments should respond to this threat. For example, they argue that despite what the scholarly literature suggests, many terrorist groups are interested in staging a nuclear catastrophe, and that the nuclear materials required to make a bomb are not as impossible for terrorists to obtain as some government officials believe. They also note that it is not possible to put in place around the United States and other major countries a security cordon that can reduce to a low level the risk that nuclear weapons and materials might be smuggled in. Overall, their analysis helps guide our understanding of the threat and how best to prevent and respond to nuclear terrorism in new and more sophisticated ways.

And in the final selection in this part, Professor John Mueller of the Ohio State University offers a different perspective about the threat of nuclear terrorism. In his view, alarms about such an attack must be tempered by several key realities. First, terrorists have likely realized that the chances to succeed in acquiring and deploying a nuclear weapon are exceedingly small. It is highly improbable that a would-be atomic

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terrorist would be given or sold a bomb by a state, and manufacturing the device themselves from stolen materials would require a considerable series of difficult hurdles to be conquered in sequence, including the effective recruitment of people who at once have great technical skills and will remain completely devoted to the cause. The combination of technical challenges, operational security, and financial costs for this kind of attack could easily become insurmountable.

Case Studies

Finally, this unit concludes with four case studies, each of which addresses specific areas of concern regarding one or more of the weapons categories discussed above. First, David Albright and Cory Hinderstein of the Institute for Science and International Security examine the development and implications of the A. Q. Khan clandestine network. Khan, with the help of associates on four continents, managed to buy and sell key nuclear weapons capabilities for more than two decades while eluding the world's best intelligence agencies and nonproliferation institutions and organizations. They created a network of suppliers, manufacturers, and shippers that provided secret nuclear technology to Iran, Libya, North Korea, and perhaps others. After describing these events and the environment that enabled them, Albright and Hinderstein offer recommendations for how to make it significantly more difficult for nuclear smuggling to occur.

In the next case study, Professor Jeffrey Bale of the Monterey Institute for International Studies describes how ethno-nationalist separatism and Islamism, combined with brutal Russian repression, have unfortunately succeeded in fueling hatred, cruelty, and violence in Chechnya and other regions of the North Caucasus. Although several incidents involving radiological materials have occurred in this conflict, he notes that a true mass casualty event involving a radiological dispersion device would require international assistance from ideologically-aligned or sympathetic groups.

And in the last article of this unit, three physicians associated with the U.S. military—Robert Jones, Brandon Wills and Christopher Kang—describe recent events involving chlorine gas and its use by terrorists, discuss pre-hospital considerations and suggest strategies for the initial management for acute chlorine exposure events. They note that Operation Iraqi Freedom has demonstrated the use of weaponized chlorine transport vehicles, resulting in hundreds of casualties. Successful management of a chlorine mass casualty incident requires increased awareness and planning, proper equipment and training for emergency responders, and a network of supporting medical facilities.

Together, these chapters provide a solid grounding in the scientific and technical aspects of these weapons, where and how they may be available, and those who have indicated an interest in acquiring them. Of course, it must be noted that these are necessarily snapshots in time: new discoveries in science and technology occur daily, criminal and terrorist networks are constantly changing, and national strategies and policies can have a positive (or negative) impact on the evolving threat of WMD and terrorism. Because of these temporal dynamics, readers are encouraged to monitor these issues regularly and explore new sources of information that provide the most current understanding of the threat.

Second Edition

WEAPONS *of* MASS DESTRUCTION

and TERRORISM

James J.F. Forest
University of Massachusetts, Lowell

Russell D. Howard
Brigadier General USA (Ret.)

Foreword by
Ambassador Michael Sheehan

