



Is the US Prepared for a Chemical Attack?

CBRN Policy Brief #1

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Biodefense Graduate Program

About the CBRN Policy Brief Series

The CBRN Policy Brief series provides the George Mason University Biodefense Program faculty and affiliated research scientists a platform for providing expert analysis on current issues in domestic and international security.

About the Author

Dr. Garza is an Affiliate Research Scientist with the George Mason University Biodefense Program. He served as the Assistant Secretary for Health Affairs and Chief Medical Officer at the Department of Homeland Security from 2009 until April of 2013. During his career at DHS he managed the Department's medical and health security matters, and oversaw the operational health aspects for all chemical, biological, radiological and nuclear hazards. He lead efforts to ensure that the Department was prepared to respond to biological and chemical weapons of mass destruction and was in charge of the major CBRN programs inside DHS including the National Biosurveillance Integration Center, the Chemical Defense Program and the BioWatch program.

Prior to joining the Department, Dr. Garza spent 13 years as a practicing emergency physician, researcher and medical educator. Dr. Garza has worked as a Nationally Registered Paramedic as well as an EMS medical director. He is an expert in EMS systems and the delivery of quality care in the out of hospital environment.

Dr. Garza continues to serve in the U.S. Army Reserves as the Command Surgeon for the 352nd Civil Affairs Command. He has deployed as a battalion surgeon and public health team chief with the US Civil Affairs and Psychological Command (USACPOC) during Operation Iraqi Freedom and Operation Flintlock in Dakar, Senegal. Dr. Garza earned over a dozen awards including the Bronze Star and Combat Action Badge.

Dr. Garza holds a medical degree from the University of Missouri - Columbia School of Medicine and a Masters of Public Health from the Saint Louis University College of Public Health. He is a Senior Editor for the Oxford Handbook in Disaster Medicine and has authored numerous chapters in emergency medicine texts and has multiple peer-reviewed publications. He has lectured nationally and internationally about emergency, and disaster medicine and is one of the nation's foremost experts on the intersection of security and health.

About the Graduate Program in Biodefense

The George Mason University Graduate Program in Biodefense offers students the opportunity to pursue a MS or PhD in Biodefense. The goal of the Biodefense Program is to educate the next

generation of biodefense and biosecurity professionals and scholars. The program operates at the nexus of science and policy to provide students with the knowledge, skills, and training to assess the risks posed by natural and man-made biological threats, while teaching them to develop strategies for reducing these risks to national and international security. The Biodefense program seeks to train students for employment in all sectors, including work with the U.S. government, private corporations, and non-governmental organizations. The program provides students with a broad background in the science and technology of biodefense, while giving them the opportunity to specialize in the narrower fields of International Security, Terrorism and Homeland Security, or Technology and Weapons of Mass Destruction. To learn more about the program, visit us online at pia.gmu.edu.

Summer Program in International Security

GMU Biodefense also offers a summer program in International Security, featuring two professional short courses: the annual “[Pandemics, Bioterrorism, and International Security](#)” and the newly introduced “[Terrorism Analysis: Quantitative and Qualitative Research Methodologies and Tools](#)”. If you’re interested in biodefense but unsure if you could spend an entire summer studying it, these short courses are a great introduction to the key issues and debates in the field.

The Summer Program is structured such that “Pandemics, Bioterrorism, and International Security” introduces attendants to the most important issues within biodefense and security today, while “Terrorism Analysis: Quantitative and Qualitative Research Methodologies and Tools” delves deeper into the methodology involved in studying these issues. More information on both courses is available [here](#).

Graduate Certificate in Critical Analysis and Strategic Responses to Terrorism

The GMU Biodefense program also offers a part-time graduate certificate [in Critical Analysis and Strategic Responses to Terrorism](#) (CASR). The CASR is an interdisciplinary introduction to the phenomenon of modern terrorism and its implications for US domestic and foreign policy. It focuses on multidisciplinary analysis and holistic cross-sectorial approaches to long-term prevention of and response to terrorism.

Three unrelated events that occurred in April 2013 remind us that terrorism, including the use of chemical, biological, radiological, nuclear and explosive weapons (CBRNE), remains an ever-present danger to the United States. On April 15, improvised explosive devices (IEDs) were used to attack the Boston Marathon, killing three and wounding 150. The weapons used in the attack were reportedly based on a design found in an English-language online magazine published by an al-Qaeda affiliate in Yemen. Other issues of this magazine have called on jihadists to use chemical and biological weapons as well. The following day, the first of three letters containing the toxin ricin and addressed to government officials, including President Barack Obama, were intercepted. The FBI has arrested a Mississippi man for sending the letters. A week later, the United States publicly accused the Syrian government of using the nerve agent sarin against its own people. The United States and other countries remain concerned that Syria's stockpile of chemical weapons, believed to include the chemical warfare agents mustard, sarin, and VX, could potentially be transferred by the Syrian government to proxy groups such as Hezbollah or stolen during the chaos created by the country's civil war. One of the rebel groups, Jabhat al-Nusra (al-Nusra Front), has declared its allegiance to Ayman al-Zawahiri, who became the leader of al-Qaeda following Osama bin Laden's death in 2011.

Although the alleged use of chemical weapons occurred halfway around the world, it is still important to ask the question: how well prepared is the United States against chemical terrorism? In 2008, the Partnership for a Secure America published a report giving the United States a grade of B- on reducing the chemical terrorism threat. Where do we stand today, five years later?

This CBRN Policy Brief provides an overview of measures taken by the Federal government to prevent, prepare for and respond to a chemical terrorist incident. Over the past decade, the United States has greatly improved its capability for responding to chemical terrorism. Further steps are needed however to make the country more resilient against these threats.

CHEMICAL WEAPONS IN BRIEF

Chemical weapons are toxic mixtures that through their chemical action on life processes can cause death, temporary incapacitation or permanent harm. In addition to traditional chemical warfare agents, toxic industrial chemicals (TICs) and toxic industrial materials (TIMs) can also be used by terrorists targeting chemical storage sites and manufacturing plants (see Table 1).

TABLE 1. Chemical Threats to Homeland Security

Chemical Warfare Agents	Toxic Industrial Chemicals/Toxic Industrial Materials
Sulfur Mustard	Chlorine
Sarin	Methyl isocyanate
VX	Sulfur dioxide
Tabun	Ammonia
	Hydrogen chloride

Chemical weapons pose quite different challenges than the other weapons included in the category of CBRNE. Some lethal chemicals are colorless and odorless, making a release less obvious. Chemical weapons also by and large act rapidly whereas biological weapons need incubation periods of days to weeks before victims become symptomatic. This is an important distinction because it places a much larger burden on the local first responders to mitigate a chemical attack and take care of the victims. In addition, the issues of decontamination and responder safety make the rescue and treatment of victims of a chemical attack much more complex than in the case of an attack involving explosives. Chemical attacks also present a tremendous psychological problem as was witnessed in the sarin gas attacks by the Aum Shinrikyo cult in Japan. Scores of “worried well” flooded emergency departments fearing they had been exposed to sarin. The effects of a chemical attack, though it may or may not cause large numbers of casualties, would have devastating effects on the way of life in America.

OVERVIEW OF U.S. PREPAREDNESS FOR CHEMICAL TERRORISM

Following the pillars of national preparedness described in Presidential Policy Directive 8, this section provides a broad overview of U.S. capabilities and programs to prevent, protect, mitigate respond to, and recover from a chemical terrorism attack.

Prevention and Protection:

Federal Bureau of Investigation (FBI): In July 2006, the FBI created the [Weapons of Mass Destruction Directorate](#), or WMDD. Through the WMDD, the FBI focuses on intelligence, training, and awareness-raising as well as counterproliferation and preventing the acquisition of precursor chemicals. The FBI has designated a WMD Coordinator in all 56 of its field offices who provide these services and serve as a point of contact to report suspicious orders or behaviors relating to chemicals.

Department of Homeland Security (DHS): The Department of Homeland Security has a large chemical defense portfolio spread out across various offices.

The Chemical Facility Anti-Terrorism Standards (CFATS) program run by the [National Protection and Programs Directorate](#) (NPPD) provides risk-based security strategies and performance standards for chemical facilities. The goal of CFATS is to reduce the vulnerability of chemical facilities to sabotage or theft of chemicals that could be used in an explosive device or chemical weapon. In addition NPPD works with chemical facility operators to discuss security and threat information through the government coordinating councils.

The [Science and Technology \(S&T\) Directorate's Chemical Security Analysis Center](#) (CSAC) provides scientific and risk based assessments for the chemical threat including a comprehensive Chemical Terrorism Risk Assessment (CTRA). The CTRA is developed with input from the intelligence community and is used to assist various customers in the Federal government set priorities for the development of chemical defenses, such as medical countermeasures, detection devices, and chemical defense policies.

The S&T Directorate's Chemical and Biological Division (CBD) performs testing and development of chemical sensing technology for its operational partners.

The [Office of Health Affairs \(OHA\)](#) runs the [Chemical Defense Program](#) whose mission is the operational side of responding to chemical terrorism. In conjunction with Federal partners, this program develops national policy objectives and operational strategies to develop whole-of-community approaches to chemical terrorism. Unlike

the BioWatch program run by OHA, which provides a national platform and coordinated operations for the detection of biological agents, no such program for chemical terrorism exists. Instead there are multiple different programs and sensors used by various municipalities around the nation in high traffic areas such as subways and sporting venues. Recently OHA helped fund programs to review performance in detection technology, develop community-based risk assessments and concepts of operation, as well as guidance documents for state and local partners regarding mass decontamination.

Federal Emergency Management Agency (FEMA): Through the [Center for Domestic Preparedness](#) (CDP) and the Noble Training Facility in Anniston, GA, FEMA supports the training of first responders and others on the effects of CBRNE weapons. The CDP began operations in June 1998 as an all-hazards training center and is DHS's only federally chartered Weapons of Mass Destruction (WMD) training center.

Department of Health and Human Services (HHS) supports the prevention of and protection against chemical terrorism through a number of different programs. [The Assistant Secretary for Preparedness and Response \(ASPR\)](#), in partnership with DHS and other Federal agencies, supports the development of guidance for first responders including mass decontamination. The Biological Advanced Research and Development Agency (BARDA) develops the next generation of chemical antidotes for inclusion in the Center for Disease Control and Prevention (CDC)'s Strategic National

Stockpile. The National Library of Medicine (NLM) hosts various resource materials for health care providers on the diagnosis and treatment of chemical terrorism agents including the [Chemical Hazards Emergency Medical Management \(CHEMM\)](#) program.

Mitigation, Response and Recovery

HHS: In the event of a chemical terrorist attack, HHS is the lead federal agency under Emergency Support Function 8 for providing public health and medical services. ASPR administers the [Hospital Preparedness Program](#) which provides funding to states, territories and municipalities to improve surge capacity and enhance hospital and community preparedness for public health emergencies, including chemical accidents and attacks.

Centers for Disease Control and Prevention (CDC): Since 1999, the CDC has providing funding to state, territorial and local public health departments to prepare for public health emergencies including those caused by CBRN terrorism. The CDC has also launched some initiatives specific to responding to the chemical threat. In 2003, the CDC launched the [CHEMPACK program](#) which provides nerve agent antidotes for pre-positioning by State, local, and/or tribal officials throughout the U.S. There are approximately 2,000 caches at about 1,300 separate locations across the country. The CHEMPACK Program is envisioned as a comprehensive capability for the effective use of medical countermeasures in the event of an attack on civilians with nerve agents.

The CDC also runs the [Laboratory Response Network for Chemical Threats \(LRN-C\)](#) which is comprised of fifty-three laboratories around the nation that can diagnose exposure to a wide range of chemical threats. These laboratories are tiered based on their capabilities and include ten Level 1 laboratories which serve as regional surge-capacity laboratories for CDC. These labs are able to detect exposure to an expanded number of chemicals, including mustard agents, nerve agents, and other toxic industrial chemicals.

Department of Defense (DOD): DOD has robust capabilities to support domestic incidents including CBRNE attacks. Among these is the [US Army 20th Support Command](#) which integrates, coordinates, deploys, and provides CBRNE response forces. Although their mission is primarily in support of overseas contingencies and warfighting operations, this unit also supports homeland defense. DOD also maintains 57 **National Guard Civil Support Teams (CSTs)** to support states with the identification and assessment of hazards, provide advice to civil authorities, and facilitate the arrival of follow-on military forces in the event of an intentional or unintentional release of CBRN materials.

The Environmental Protection Agency (EPA) On-Scene Coordinators work with various Federal, State and local agencies to assure air monitoring, site assessment, and remediation in the event of a chemical release. In addition, the EPA has an Environmental Response Team (ERT) and a [Chemical, Biological, Radiological, and Nuclear Consequence Management](#)

[Advisory Team](#) (CBRN CMAT) that can provide scientific and technical expertise to the On-Scene Coordinators for all phases of

consequence management, including sampling, decontamination, and clearance.

RECOMMENDATIONS

1. Focus on the local first responder. Although the Federal Government has many programs to assist in the event of a chemical terrorism attack, the focus should always be on helping local first responders. The impact of a chemical attacks will most likely be sudden, with little or no advance warning. Improving survival and limiting morbidity of victims will depend on swift actions by the people on the front lines. All of the response capabilities that are contained within the Federal government will never get to the scene in enough time to mitigate most of the effects of a chemical release.

2. Improve interagency and intergovernmental coordination. As can be seen from the above description of Federal efforts to prevent, prepare for and respond to chemical terrorism, there are multiple programs that seem to perform similar functions. While most of the CBRNE expertise is coordinated in one place for the DOD, other organizations, including DHS, lack the equivalent convenience of a single point of contact and coordinating entity. This makes comprehensive policy planning and effective budgeting incredibly difficult. Each department within the Executive branch should designate a single office as the lead for CBRNE issues to better coordinate both within the Federal government and with state and local stakeholders.

3. Better coordination of chemical detection systems and national standards for detection systems. Unlike the national BioWatch system for biodetection, there is no coordination between different chemical detection systems used around the country in different venues. Furthermore, there is no specific detection standards for the multiple different chemical sensors currently marketed for detection purposes. Most of this equipment will be paid for with Federal grant dollars. It only makes sense that the taxpayer dollars should fund equipment that has met a standard for performance.