

Chemical Terrorism: Assessment of U.S. Strategies in the Era of Great Power Competition

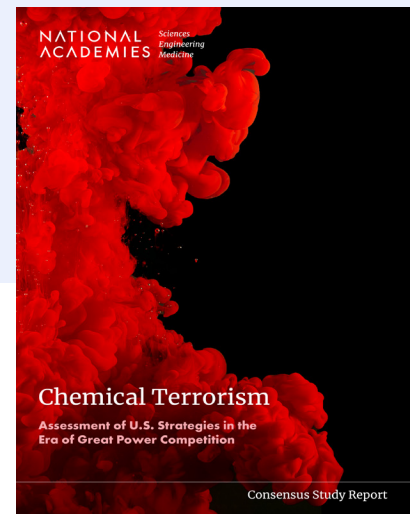
Domestic and foreign violent extremist organization, or terrorist groups, have caused a greater amount of harm with chemical agents than with biological or radiological weapons. Incidents or attempts at chemical terrorism have involved more than 100 different perpetrators motivated by a wide range of ideologies (see Figure 1). Chemical agents used in those attacks include commonly available chemicals (e.g., fertilizers), toxic industrial chemicals (TICs) and toxic industrial materials (TIMs), and chemicals used in the military context such as the nerve agent, sarin. Dispersal methods used include explosive devices and the spraying of aerosols.

The U.S. capacity and capability to identify, prevent, counter, and respond adequately to chemical threats is established by the strategies, policies, and laws enacted across multiple levels of government. To date, there has not been a chemical terrorist event in the United States that has had consequences approaching those observed outside of the country. Generally, U.S. response organizations have been effective in identifying and thwarting chemical threats, with a few notable exceptions.

While the number of chemical terrorism incidents has risen and fallen over time, there is no empirical or analytical indication that the threat is disappearing. Factors that could increase that threat include the large and growing number of available chemicals and a rise in foreign or domestic terrorism in general. Of particular concern is the growing trend for state actors and terrorists to collude in this era of Great Power Competition (GPC). GPC is a strategic posture that the United States has taken over the last decade to focus on challenges from interstate competition. This study, which was recommended in the 2021 National Defense Authorization Act (NDAA), reviews the adequacy of U.S. strategies to prevent, counter, and respond to chemical terrorism.

PRIORITIES IN A SHIFTING THREAT LANDSCAPE

This report comes at a time when the nation's highest-level strategies have shifted from focusing primarily on violent extremist organizations to focusing



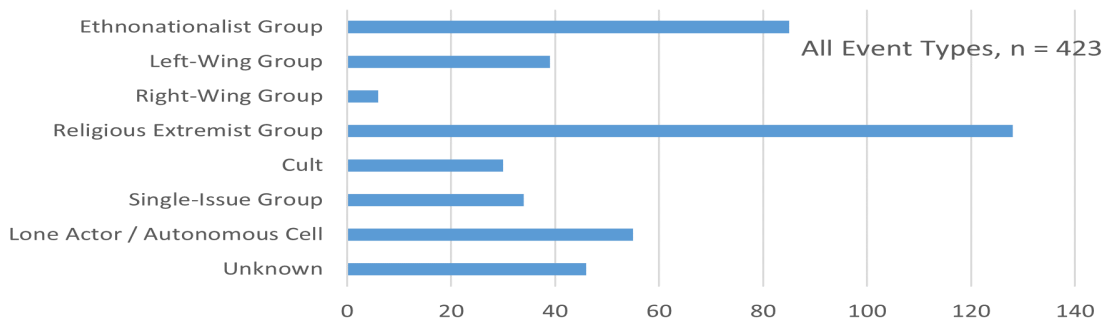


FIGURE 1: Interest in or pursuit of chemical weapons by perpetrator (Binder and Ackerman, 2020).

more on the GPC. In the words of President Biden, “*The most pressing strategic challenge facing our vision is from powers that layer authoritarian governance with a revisionist foreign policy... a challenge to international peace and stability.*” This shift in relative perceived threat and consequent prioritization will impact efforts against chemical terrorism, and in turn, affect funding priorities.

Recommendation: The shift in the global threat landscape has led to a corresponding shift in countering weapons of mass destruction (WMD) to a focus on GPC, but care should be taken to ensure existing capabilities focused on countering terrorism are maintained. Recommendations based on revised risk assessments that are aligned with new national-level priorities should be developed.

IDENTIFYING CHEMICAL THREATS

The total number of chemicals that constitute or could constitute WMD chemical terrorism threats is vast and continually expanding. Over 200 million chemicals have been synthesized or isolated, and another is identified every 3–4 seconds. While it is impossible to identify and prevent or counter every threat, the intelligence community should continue to monitor trends by terrorist groups to innovate and improvise using chemical agents, including identifying the chemicals that may be used in an attack, potential threat actors, and entities that may support or sponsor chemical attacks or terrorism.

The report concludes that the Federal Bureau of Investigation (FBI) and partner law enforcement and intelligence communities have been effective in identifying and interdicting the majority of domestic terrorist attacks involving chemical materials, which have

typically employed conventional TICs rather than chemical warfare agents. However, efforts could be strengthened by working on communication and coordination between local and state enforcement and the intelligence community. Additional recommendations include looking beyond traditional terrorism suspects, updating threat assessments, and improving the ability to detect potential migration of chemical agents and technology from state actors to violent extremist organizations.

PREVENT AND COUNTER CHEMICAL WMDs

After reviewing several agency strategy documents to prevent and counter chemical WMDs, the report concludes that most of them have a coherent action plan or set of strategy elements that include a well-defined goal with a corresponding definition of success, as well as at least one policy, plan, and/or resource allocation designed to meet the goal. Successful strategies focus on the following elements, each of which was assessed in this report:

Deterrence. Deterrence is the effort to dissuade an adversary from undertaking an action by using negative incentives. Multiple agency documents refer to deterrence by denial, which attempts to dissuade an actor by denying attainment of benefits. Some documents reference deterrence by punishment, for example use of “overwhelming force” against any use of WMD against the United States.

Recommendation: The National Security Council should give careful consideration to incorporating direct deterrence of chemical terrorism into existing Chemical WMD Terrorism (WMDT) strategies.

Reducing Material Availability and Chemical Substitution. Chemicals are on a spectrum from extremely accessible (e.g. commercially available household chemicals), relatively accessible (e.g. TICs from chemical plants and manufacturing facilities), to extremely inaccessible (e.g. organophosphate nerve agents). Regulatory efforts to reduce material availability include EPA’s Management Program Regulation, and the former DHS’s Chemical Facility Anti-Terrorism Standards (CFATS) program, which once played an important role in regulating material availability.

Another key avenue by which the risk of chemical terrorism can be reduced is to replace existing processes and materials with less toxic alternatives, often referred to as inherently safer technology. For decades, occupational and environmental safety concerns have long driven industry to seek substitution as a strategy to mitigate hazards as reflected in works by Occupational Safety and Health Administration and EPA. However, the strategy documents do not cite chemical substitution as a key part of an overall chemical security strategy.

Recommendation: Congress should immediately reauthorize the CFATS program and consider long-term reauthorization.

Recommendation: Substitution of safer alternative chemicals for hazardous chemicals in industrial and academic settings should be included as part of the overall strategy to impede acquisition of raw materials for chemical terrorism.

Addressing Insider Threats. In certain sectors, the threat lies not only in the theft of information and the disruption of an organization’s functions, but also in the possibility that sabotage by insiders could have extremely detrimental consequences for broader public health and safety. Despite this significance, strategic documents surveyed did not explicitly mention insider threat in the chemical terrorism context.

Recommendation: Counter-insider threat activities should be incorporated explicitly into broader counter WMD strategy. The Department of Homeland Security should develop a strategy to ameliorate insider threats explicitly for the chemical domain.

Other Prevent and Counter Activities. Some of the effective activities and programs undertaken by the U.S. government are not mentioned in the strategy documents reviewed, for example: military capabilities to provide early warning of chemical terrorism plots; law enforcement capabilities to counter chemical threats tactically; and integration of strategies with broader counter-terrorism and counter-smuggling efforts. The absence of such activities from the strategies could impact policy implementation, such as budgeting, program prioritization, and other consequences

Recommendation: Agencies should work to reconcile operational practice with policy by supplementing extant strategies to include current omitted effective activities and programs for countering chemical terrorism.

ADEQUACY OF STRATEGIES TO RESPOND TO CHEMICAL TERRORISM

The vast majority of chemical incidents in the United States are not from terrorism but are instead chemical releases from accidents, transportation incidents, or the results of natural phenomena, which over the period of 2012–2022 caused nearly 100 recorded fatalities and almost 2000 injuries. Selected agency strategies for responding to chemical terrorism were evaluated according to the following criteria: their ability to enable a response that will minimize potential impact to life, property, and the environment; their alignment with the priorities of the United States; and whether they anticipate emerging threats.

The report concludes that the United States has well-defined authority and organizational constructs for emergency response, including large-scale and chemical terrorism response. Extensive multi-agency response capabilities are complexly governed, coordinated in policy, sufficiently connected to intelligence activities, and sufficiently capitalized; however, a mass casualty, multi-point, or cross-jurisdiction incident could have an impact beyond the State, Local, Territorial, and Tribal (SLTT) capabilities. While in the context of a GPC-focused national strategy, it is difficult to recommend dramatic investments or changes, there are opportunities for improvements in the following areas:

Need for First Responder Input. A major component for creating a robust strategy is to ensure critical information is collected and included from the first responder community.

Access to Intelligence. Providing first responders with quick access to critical information during hazardous material incidents and other emergencies is of paramount importance. However, several informational networks serving that purpose have been discontinued, and at times, information that would be most helpful is classified.

Top-Down and Bottom-Up Information Flow. All the agency briefings demonstrated a clear understanding looking upstream to current authorities, strategies, policies, and laws governing internal agency responsibilities. However, less clear is the systematic flow of information downstream to subsidiary organizations and finally to first responders. Unclear chains of communication could lead to confusion at the local level that could potentially impede response to an incident.

Enhanced Interagency Coordination. Coordination among the different organizations can be improved to ensure first responders receive the needed information. Work by Federal Emergency Management Agency and the FBI is building relationships that can encourage a smoother

response to a chemical incident, for example, through workshops and trainings.

Recommendation: Considering the complexity of the chemical threat space and U.S. government coordination required for an effective response to a chemical event, the committee recommends continuing a robust program of inter-agency exercises and trainings that practice communication and resource sharing.

BUDGET RECOMMENDATIONS

If resources for counter terrorism decrease due to the shift towards GPC, then a burden will be placed on existing programs to use their resources more efficiently in countering chemical threats. The report's authoring committee heard from several agencies that budgets are inadequate to address the breadth of possible chemical threats, even for agencies for which WMD is the highest priority. The material reviewed by the committee showed insufficient detail to allow a robust assessment of budgets likely to be required to implement strategies effectively. Revised risk assessments are needed to reprioritize risks guided by new strategies, so that strategy-aligned budgets can be created. The report recommends that WMD budgets be aligned with evolving priorities and incentivize activities that transition promising research to operations.

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