

# BRIEFER

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## Definitions Matter: The Role of WMD in Shaping U.S. National Security Strategy

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### Introduction

To develop its national security strategy, the U.S. government typically formulates a set of agreed definitions and concepts about the current threat environment to help delineate top priorities. Once established, these impose clarity on mission spaces, shape the delegation of tasks and operations, justify budgets and the distribution of resources and personnel, and influence organizational structures. The notion of weapons of mass destruction (WMD) has long served as one of these key defining concepts that shape U.S. national security strategy. The two most common characteristics used to define WMD are mass casualties and mass destruction, as indicated by the U.S. Department of Defense's definition.<sup>1</sup> These characteristics were intended to clarify why the U.S. places top priority on WMD in its national security strategy; they are capable of significant damage in terms of destruction, casualties, and strategic impact.<sup>2</sup>

Within the U.S. context, concepts about the threat environment tend to evolve incrementally with changes in administration and the emergence of new technologies and threats, or specific events that dramatically alter threat perceptions. However, the longer certain threat perceptions survive the political wrangling of opposing interests, the more likely they evolve into threat paradigms—i.e., patterns or standard models of behavior, against which any new ideas about emerging threats are thoroughly tested. In such cases, a major catalyzing event must occur to produce dramatic change and reorganization of national security priorities.

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<sup>1</sup> *DoD Dictionary of Military and Associated Terms*, June 2019.

<sup>2</sup> See W. Seth Carus, *Defining "Weapons of Mass Destruction"*, Occasional Paper No. 8, Washington D.C.: National Defense University, 2012.

The major overhaul of the U.S. government in response to the 9/11 terrorist attacks illustrates the impact of such an event. The attacks brought the growing strategic threat of violent non-state actors to the fore. Despite being conducted with civilian aircraft rather than what is usually considered to be WMD, the 9/11 attacks coupled with the 2001 anthrax letters mailed to Congressional offices and elsewhere further cemented the threat of WMD in the minds of U.S. policymakers and led to the first-ever national-level strategy to counter WMD in 2002.<sup>3</sup> For many, a WMD attack in the United States was not a matter of if, but when.

Yet the character of the threat of WMD in the hands of both states and violent non-state actors remains up for debate since the actual track record of WMD use contains some unexpected, historical twists. Despite their intentions, the WMD-related activities of violent non-state actors have been stopped or mostly unsuccessful in recent decades.<sup>4</sup> Eschewing for now the potential of WMD for mass destruction, several nations have focused their attacks on targeting individuals for political assassinations or specific populations in domestic or regional conflicts (in several cases, using chemical weapons).

Beyond the use of nuclear weapons for deterrence, it is clear that some actors likely consider using WMD in order to capitalize on their disproportionate psychological effects and for their significant advantage of mass publicity. Meanwhile the toolbox available to malicious actors seeking to achieve strategic impact appears to be expanding as a result of new technologies and a growing variety of mass effect scenarios.

Why have U.S. policymakers prioritized WMD in a way that excludes other risks capable of producing mass effects? Are there new types of technologies and scenarios that rise to the level of WMD that should be prioritized as well? Should policymakers put more emphasis on the implications of WMD use at the lower end of the casualty/destruction spectrum? Has WMD lost its utility as an organizing principle for U.S. national security?

This briefer is the second in a series in which I deconstruct the concept of WMD and its influential role in shaping U.S. national security policy. It examines the extent to which WMD has become a paradigm—an organizing principle for U.S. national security bureaucracy and a surrogate for thinking about strategic threats—with major implications for the ability of the U.S. to confront new systemic and potentially existential threats. This briefer begins with a detailed overview of the origins of the term WMD and its emergence as a paradigm. It concludes by examining the historical record of WMD as a means to assess its utility as an organizing principle.

### Early Origins of “Weapons of Mass Destruction”

The term “weapons of mass destruction” originated during a specific historical context, on the heels of two destructive world wars, the fire bombings of Germany and Japan, and the use of nuclear weapons by the U.S. on Hiroshima and Nagasaki.<sup>5</sup> Archbishop of Canterbury, William Cosmo Gordon Lang is thought to be the first to use the term during a Christmas speech in 1937, but it is unclear to which weapons he was referring. By this time, chemical weapons had been widely used on the battlefield by

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<sup>3</sup> United States Government, *National Strategy to Combat Weapons of Mass Destruction*, December 2002,

<sup>4</sup> See for example, Richard Danzig, Marc Sageman, Terrance Leighton, Lloyd Hough, Hidemi Yuki, Rui Kotani and Zachary M. Hosford, *Aum Shinrikyo: Insights into How Terrorists Develop Biological and Chemical Weapons*, Washington D.C.: Center for a New American Security, 2012; Rolf Mowatt-Larssen, *Al Qaeda Weapons of Mass Destruction Threat: Hype or Reality*, Cambridge, MA: Belfer Center for Science and International Affairs, 2010.

<sup>5</sup> The term was first used in 1937 by William Cosmo Gordon Lang, the Archbishop of Canterbury, in his Christmas address. See W. Seth Carus, *Defining “Weapons of Mass Destruction”*.

Germany, France, and the United Kingdom during World War I to great effect. Germany also used biological weapons in World War I, as did Japan years later in World War II.<sup>6</sup>

The use of these weapons on the battlefield led a number of countries to sign the Geneva Protocol in 1925, an international agreement that prohibited the use of biological and chemical weapons in warfare due to their indiscriminate nature and what was perceived as unnecessary cruelty (though it did not ban countries from experimenting with or stockpiling them). With the dawn of the nuclear age in 1945, however, the focus of the international community quickly shifted away from biological and chemical weapons toward efforts to control the peaceful uses of nuclear energy by nation-states and prevent the proliferation of nuclear weapons.

After the first uses of the atomic bomb in 1945, the term WMD became tightly linked to nuclear weapons, which far exceeded the explosive power of conventional alternatives at the time. Although the Tokyo fire bombings during World War II decimated the city and killed as many as 100,000 people, the campaign required 48 hours and approximately 2,000 tons of incendiary bombs delivered by 300 B-29 aircraft.<sup>7</sup> In stark contrast, the two atomic bombs dropped on Hiroshima and Nagasaki were carried by two B-29 aircraft. The two atomic bombs killed about the same number of people in each city in just a few hours. Each atomic bomb contained ten times the explosive power of the conventional munitions dropped on Tokyo. The enormous destructive power of nuclear weapons left a profound imprint on the minds of world leaders who began to think in terms of conventional and unconventional weapons—even before the devastating long-term effects of radiation came to light.

In November 1945, the United States, United Kingdom, and Canada issued a joint declaration calling for the creation of a commission to address the challenges posed by a distinct category of “weapons adaptable to mass destruction” at the newly formed United Nations (UN).<sup>8</sup> Several years later, in 1948, the UN Commission on Conventional Armaments (CCA) defined WMD for the first time as “atomic explosive weapons, radioactive material weapons, lethal chemical and biological weapons, and any weapons developed in the future which have characteristics comparable in destructive effect to those of the atomic bomb or other weapons mentioned above.”<sup>9</sup> Note that the definition explicitly provides that WMD could encompass weapons based on new scientific principles with similar characteristics.<sup>10</sup>

During that time frame, chemical, biological, radiological, and nuclear weapons (CBRN) shared several important characteristics that distinguished them from existing conventional alternatives. For one, the new weapons were based on advances in major scientific disciplines—physics, biology, and chemistry. Using them on the battlefield required different sets of technical expertise than conventional weapons and initially produced unknown effects as demonstrated during wartime use. In the late 19<sup>th</sup> century, an international taboo began to emerge in the wake of the use of chemical weapons on the battlefield, fears about the potential development of biological weapons, and the emergence of nuclear weapons as the ultimate force of mass destruction. The emerging consensus about the moral repugnance of such weapons helped contribute to the idea of WMD as a distinct category of weapons.

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<sup>6</sup> W. Seth Carus, “A Century of Biological-Weapons Programs (1915–2015): Reviewing the Evidence.” *The Nonproliferation Review* 24, no. 1–2 (2017): 129–53. For more on the history of biological warfare, see W. Seth Carus, *A Short History of Biological Warfare: From Prehistory to the 21<sup>st</sup> Century*, Occasional Paper No. 12, Washington D.C.: National Defense University, 2017.

<sup>7</sup> Jonathan Rauch, “Firebombs over Tokyo.” *The Atlantic*, July/August 2002.

<sup>8</sup> W. Seth Carus, “Defining “Weapons of Mass Destruction,”” 7-8.

<sup>9</sup> Commission for Conventional Armaments, *Resolutions Adopted by the Commission at its Thirteenth Meeting*, 12 August 1948.

<sup>10</sup> W. Seth Carus, *Defining “Weapons of Mass Destruction”*, 21.

## The Formation of International and Domestic Bureaucratic Structures

The early definition of WMD included sufficient flexibility for considering new weapons with similar characteristics. However, the notion of CBRN as the only existing forms of WMD became deeply embedded in international and domestic bureaucratic structures established during the Cold War.

Despite rising tensions between the United States and the Soviet Union in early postwar years, the world wars also generated significant diplomatic momentum within the international community to work toward disarmament in both conventional and unconventional weapons. Unlike the more controversial realm of controlling conventional weapons, a majority of countries were able to agree on a simple definition for WMD that was sufficiently vague to secure agreement among countries with diverse interests. They were also willing to sign up to the notion of limiting the use of such weapons. As such, the problem of WMD was more amenable to certain types of diplomatic solutions than conventional weapons such as cluster bombs or landmines.

With the new priority focus on limiting nuclear weapons and maintaining stability between the United States and the Soviet Union during the Cold War, members of the international community negotiated numerous treaties, export control regimes, and other diplomatic instruments to regulate CBRN and prevent their proliferation—e.g., the Statute of the International Atomic Energy Agency in 1957, the Limited Test Ban Treaty in 1963, the Nuclear Nonproliferation Treaty (NPT) in 1968, the Biological Weapons Convention (BWC) in 1972, and the Australia Group in 1985. Some instruments even made a direct reference to the term WMD—e.g., the 1967 Outer Space Treaty, the 1971 Seabed Treaty, and the 1991 Strategic Arms Reduction Treaty.<sup>11</sup>

Such treaties and instruments required years of negotiation to finalize, but agreement was often facilitated by the perceived common interest shared by the United States and Soviet Union in preventing WMD proliferation. There was also a strong desire within the international community to avoid derailing positive developments between the two superpowers. These treaties operated on consensus, making them inherently difficult to amend and slow to adapt to new challenges. As a result of their rigid design, these instruments likely exerted stabilizing effects on relations between the United States and the Soviet Union, improving transparency and creating an atmosphere of confidence that states were complying with treaty obligations on the acquisition and use of CBRN.

Over several decades, the development of these treaties and other multilateral efforts to manage the threat of WMD led to the creation of stable bureaucratic structures at both the international and domestic levels designed to regulate state behavior pertaining to CBRN-related materials, equipment, and technology. At the international level, these structures included organizations to manage treaties, UN committees to handle the negotiation of further diplomatic instruments, and even an enforcement authority within the UN Security Council to prosecute violations of international agreements on WMD. At the domestic level, the United States and other countries stood up offices within various foreign policy and defense agencies and developed WMD expertise to manage the issues associated with these WMD-related instruments.<sup>12</sup>

By the end of the Cold War, the treatment of CBRN as a special category of weapons and the only forms of WMD had become tightly embedded in complex regimes of diplomatic instruments prohibiting,

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<sup>11</sup> Ibid.

<sup>12</sup> For example, during the Cold War, the U.S. created the Arms Control and Disarmament Agency as an independent agency within the State Department charged with treaty management and negotiation. The Department of Defense created the On-Site Inspection Agency to support inspections related to a growing number of arms control treaties.

controlling, and regulating WMD and related materials, equipment, and technology.<sup>13</sup> Whilst these bureaucratic structures were stabilizing during the Cold War, they have discouraged U.S. policymakers from thinking more broadly about the evolution of this category of threats for many decades since.

### Emergence of a WMD Paradigm in the United States

In the early 1990s, the use of the term WMD by U.S. government officials had almost died out in favor of the Cold War focus on nuclear deterrence and survivability.<sup>14</sup> However, the stage for treating CBRN as a special category of weapons and making WMD the new cornerstone of U.S. national security policy had largely been set. By this time, there were firmly established bureaucratic structures and a broad consensus on the synonymy between CBRN and WMD. Several key events during the 1990s overturned major Cold War assumptions and further confirmed WMD as a priority focus for U.S. national security strategy. With the dissolution of the Soviet Union, a multidimensional and complex threat environment emerged. As they believed they no longer faced an escalating arms race and the possibility of nuclear war between superpowers, U.S. policymakers spent much of the first decade coming to grips with the unpredictable features of the new security environment. In the face of uncertainty, U.S. policymakers seemed to at least agree on the threat posed by WMD. In 1992, President George H.W. Bush signed a National Security Directive asserting that the proliferation of WMD constituted a threat to U.S. national security interests.<sup>15</sup>

Just as the Cold War was ending, the Bush administration also negotiated significant and irreversible reductions in strategic nuclear arms between the United States and the former Soviet Union under the Strategic Arms Reduction Treaty (START). The treaty transitioned the U.S. and Russia away from an antagonistic bilateral relationship toward one defined by cooperative arms reduction despite some remaining tensions. The dissolution of the Soviet Union, along with START and the 1992 U.S. moratorium on nuclear testing, promised a reduced role for nuclear weapons and a new mission to maintain effective nuclear deterrence without the need for further testing.

With the global threat of nuclear war seemingly coming to such an abrupt end, so did fears of regional escalation and fighting limited wars. The use of chemical weapons during the Iraq-Iran war in the late 1980s and the escalating nuclear arms race in South Asia in the 1990s confirmed an important connection between regional conflicts, security concerns, and the pursuit of CBRN.<sup>16</sup> During the Gulf War in Iraq, U.S. policymakers confronted the possible use of chemical and biological weapons against American troops on the battlefield and determined the U.S. military was not adequately prepared to protect troops against such scenarios.<sup>17</sup> This new awareness reinforced the importance of nuclear, chemical, and biological defense and the creation of consequence management (i.e., pre-incident mitigation and post-incident response and restoration) as a new mission area.

Against this complex and diffuse backdrop, U.S. policymakers began the hard task of forming a consensus on the new threat environment, adjusting U.S. national security strategy to meet post-Cold War challenges. They also had to adapt the missions of key agencies to the prospect of much smaller defense

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<sup>13</sup> For a brief overview of these regimes, see Natasha E. Bajema, “Assessing the Role of the Nonproliferation Regimes: Are They Relevant Tools for Countering WMD Terrorism,” in Russell D. Howard and James J.F. Forrest, eds., *Weapons of Mass Destruction and Terrorism*, Dubuque, IA: McGraw Hill, 2007.

<sup>14</sup> W. Seth Carus, *Defining “Weapons of Mass Destruction,”* 3.

<sup>15</sup> National Security Directive 70, “[United States Nonproliferation Policy](#),” 10 July 1992.

<sup>16</sup> Gilles Andreani, “The Disarray of US Nonproliferation Policy,” *Survival* 41, no. 4 (Winter 1999-2000), 51-56.

<sup>17</sup> In his 1995 annual report to Congress, Secretary of Defense William Perry pointed out that American military forces deployed to defeat aggression would likely face the threat of use of WMD. See DTRA, [Defense’s Nuclear Agency: 1947 to 1997](#), Washington, D.C.: DTRA, 2002, 301.

budgets and declining nuclear weapon stockpiles.<sup>18</sup> The previous threat paradigm for U.S. national security had centered on guaranteeing survivability against nuclear attack and effective nuclear deterrence. However, two post-Cold War assessments, the Department of Defense's *Bottom-Up Review: Forces for a New Era* in 1993 and the *Nuclear Posture Review* in 1994, concluded that Russia was no longer an enemy of the United States. Even so, Russia's nuclear arsenal would continue to pose a potential threat in the future.<sup>19</sup>

Blatant treaty violations by Iraq, North Korea, and Russia in the 1990s overturned another key Cold War assumption. Until then, it was widely assumed that most treaty members would not violate their obligations in order to remain in good standing with the international community and to gain access to the peaceful uses of related technologies. Consequently, proliferation threats were primarily assessed to emanate from countries which had refused to sign onto the major WMD treaties. Iraq and North Korea's clandestine WMD programs shocked the international community, exposing significant gaps in the treaties and export control regimes. The violations implied that nonproliferation instruments were not sufficient for containing all threats posed by WMD. Iraq and North Korea's clandestine WMD programs reinvigorated the notion that states might seek biological or chemical weapons capability as an affordable counterbalance to the nuclear arsenals of other countries.<sup>20</sup> Exposed by defectors, Russia's blatant violations of the BWC demonstrated the potential weakness of the treaties for constraining major powers. For this reason, the U.S. government acknowledged the need to strengthen controls on WMD-related materials, equipment, and technology and engage in efforts designed to deter, prevent or defend against the use of CBRN weapons.<sup>21</sup>

With the perceived threat of WMD proliferation on the rise, terrorism also emerged as a new national security threat for the United States in the 1990s.<sup>22</sup> Given the global diffusion of dual-use technology and advanced science, U.S. policymakers needed to contend with new risks associated with violent non-state actors gaining access to "loose nukes" or weapons-grade material emanating from countries of the former Soviet Union. Meanwhile, the terrorist bombing of the World Trade Center in 1993, the Khobar Towers Bombing in 1993, the Oklahoma City Bombing in 1995, and Aum Shinrikyo's sarin attack on the Japanese subway in 1995 raised the specter of terrorist use of WMD. The subway attack killed thirteen people and sickened thousands. It was considered by many terrorism analysts to be a watershed event and a harbinger of future threats. Tying together disparate elements of the post-Cold War security environment, a consensus had emerged among U.S. policymakers by the late 1990s in which the term WMD became an important part of the national security discourse (see Table 1).<sup>23</sup> U.S. policymakers agreed that the United States faced an imminent threat of WMD in the hands of rogue states and violent non-state actors. Under the Cooperative Threat Reduction program, the Department of Defense, and later the Departments of State and Energy, began collaborating with partner countries to reduce WMD stockpiles and prevent terrorists from gaining access to WMD.

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<sup>18</sup> Ibid, 312.

<sup>19</sup> Les Aspin, US Secretary of Defense, [Report on the Bottom-up Review](#), October 1993.

<sup>20</sup> See Brad Roberts, "Proliferation and Nonproliferation in the 1990s: Looking for the Right Lessons," *The Nonproliferation Review* 6, no. 4 (Fall 1999): 70.

<sup>21</sup> The *Bottom-Up Review* provided the first national assessment of the post-Cold War environment, noted the end of the global threat posed by the USSR and identified the proliferation of NBC as the primary threat to the United States.

<sup>22</sup> *DTRA History 1998-2008*, 2.

<sup>23</sup> For example, WMD appeared 31 times in the Clinton administration's 1998 *National Security Strategy*. See W. Seth Carus, *Defining "Weapons of Mass Destruction,"* 3 and 28.

**Table 1: Estimated Usage of the Term “WMD” by U.S. Presidents and National Security Policy Documents<sup>24</sup>**

| Administration       | Used the Term WMD? | Where?  | How Many Times? |
|----------------------|--------------------|---|-----------------|
| Dwight D. Eisenhower | Yes                | Public speech   | At least once   |
| John F. Kennedy      | Yes                | Public speech   | At least once   |
| Lyndon B. Johnson    | Yes                | Public speech   | At least once   |
| Richard Nixon        | Yes                | Public speech   | At least once   |
| Gerald R. Ford       | No                 |   |                 |
| Ronald Reagan        | Yes                | Public speech   | At least once   |
| George H.W. Bush     | Yes                | Public speech   | At least once   |
|                      |                    | National Security Strategy (1990)   | 2               |
|                      |                    | National Security Directive (1992)  | At least once   |
|                      |                    | Defense Strategy for the 1990s (1993)   | 10              |
| William J. Clinton   | Yes                | Public speech   | ~63 per year*   |
|                      |                    | Executive Order 12938 (1994) on WMD   | 9               |
|                      |                    | National Security Strategy (1998)   | 33              |
|                      |                    | Other documents   | 500             |
| George W. Bush       | Yes                | Public speech   | ~100 per year*  |
|                      |                    | National Security Strategy (2002)   | 24              |
|                      |                    | National Security Strategy (2006)   | 34              |
|                      |                    | Combating WMD Strategy (2002)   | 72              |
|                      |                    | Other documents   | 820             |
| Barack Obama         | Yes                | Public speech   | ~20 per year*   |
|                      |                    | National Strategy for Countering Biological Threats (2009)                    | 2               |
|                      |                    | National Security Strategy (2010)   | 6               |
|                      |                    | National Security Strategy (2015)   | 4               |
|                      |                    | Other documents   | 50              |
| Donald Trump         | Yes                | Public speech   | Frequent        |
|                      |                    | National Security Strategy (2017)   | 10              |
|                      |                    | National Biodefense Strategy (2018)   | 3               |
|                      |                    | National Strategy for Countering Weapons of Mass Destruction Terrorism (2018) | 145             |
|                      |                    | Other documents   | 7               |

\*Denotes average number of references per year across a presidential term.

The U.S. government decided to devote significant resources to new mission sets such as counterproliferation and consequence management that would address the prospects of failed nonproliferation efforts, which could open the door for WMD to be used against a U.S. city or American forces abroad.<sup>25</sup> The shift from a focus on nuclear deterrence between superpowers to the potential use of WMD by rogue states and violent non-state actors thrust the mission space of certain government

<sup>24</sup> The research conducted by W. Seth Carus in *Defining “Weapons of Mass Destruction”* was used as the initial basis for this chart, which was built upon with more recent documents in order to count the references.

<sup>25</sup> National Defense Panel, *Transforming Defense: National Security in the 21<sup>st</sup> Century*. Washington D.C.: Department of Defense, 1997. Secretary of Defense William Cohen stated “as the new millennium approaches, we face the very real and increasing prospect that regional aggressors, third-rate armies, terrorist groups and even religious cults will seek to wield disproportionate power by acquiring and using these weapons that can produce mass casualties. These are neither far-fetched nor far-off threats.”

agencies into question, requiring major bureaucratic adaptation and reorganization.<sup>26</sup> As an example, the perceived threat of terrorist use of WMD increased political support for the establishment of the Defense Threat Reduction Agency (DTRA) in 1998, a move which joined together several existing agencies and new programs, and refocused the mission specifically to addressing WMD threats.<sup>27</sup>

Two decades later, the role of WMD as priority threat in shaping U.S. national security policy has been mostly unchanged (see Table 1 for the ongoing use of the term across three administrations).<sup>28</sup> Although mission areas, pillars, and nuances of various agency strategies to counter WMD have evolved incrementally, the treatment of WMD at the national level has remained the same since the late 1990s. In December 2018, the Trump administration released the *National Strategy for Countering Weapons of Mass Destruction Terrorism*. The document represented the second WMD-threat-focused national-level strategy in U.S. history, but it was the first strategy focused solely on the threat of WMD terrorism.<sup>29</sup> Although the text mirrored the language of the previous strategy on WMD released by the Bush administration in 2002, the Trump administration argued that the threat of WMD terrorism had become “progressively more acute” due to the growth in terrorist capabilities and the spread of dual-use technology.<sup>30</sup>

### Assessing the “WMD Paradigm” Against the Record of Use Since 1990

For the past three decades, the WMD paradigm has served as a defining feature of U.S. national security strategy. However, when assessing the WMD paradigm against the historical record of use cases by state and violent non-state actors over the past three decades, it is difficult to see its continuing utility as an organizing principle for a number of reasons--especially at the exclusion of other types of threats with the potential for mass effects.

#### *Violent Non-State Actors*

Since 9/11, violent non-state actors have been considered the most likely users of WMD, given their propensity toward mass casualties and lesser concerns about attribution and retaliation. Many experts assume that terrorists today have greater access to technical information, requisite expertise, and the ability to acquire necessary materials and equipment than ever before, especially for conducting attacks using chemical weapons.<sup>31</sup> A recent study found an estimated total of 1,061 people have died worldwide over a forty-year time period ending in 2012 as a result of incidents involving the use of chemical agents

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<sup>26</sup> The Defense Nuclear Agency’s charter was “modified to provide focus for non-nuclear activities of critical importance to DoD.” See DTRA, *Defense’s Nuclear Agency: 1947 to 1997*, 309. In response to several assessments including the Defense Science Board 1997 Summer Study on Transnational Threats, Secretary of Defense Bill Cohen called for a review of all Department of Defense organizations and support agencies dealing with threats of WMD, nonproliferation, and counterproliferation. [Volume I](#) of *The Defense Science Board 1997 Summer Study Task Force on DoD Responses to Transnational Threats* examined the nature of the threat and response and [Volume II](#) addressed the topic of force protection.

<sup>27</sup> Bianca J. Adams and Joseph P. Harahan, [Responding to War, Terrorism, and WMD Proliferation: History of DTRA, 1998-2008](#), DTRA History Series, Washington, D.C.: DTRA, 2008, 3.

<sup>28</sup> See Carus, *Defining “Weapons of Mass Destruction.”*

<sup>29</sup> [National Security Strategy for Countering Weapons of Mass Destruction Terrorism](#), Washington D.C.: White House, 2018.

<sup>30</sup> *Ibid.* See also [National Strategy to Combat Weapons of Mass Destruction](#), Washington D.C.: White House, 2002.

<sup>31</sup> Sammy Salama and Edith Bursac, “Jihadist Capabilities and the Diffusion of Knowledge,” in Gary Ackerman and Jeremy Tamsett, eds., *Jihadists and Weapons of Mass Destruction: A Growing Threat*, Taylor & Francis (Auerbach Publications), December 2008.

by non-state actors.<sup>32</sup> Given that chemical weapons are most often used, this tally is quite revealing. The casualties and destruction caused by terrorist attacks using conventional means have more often than not exceeded those caused by WMD-related incidents--the 9/11 attack alone exceeded the number of people killed by the use of WMD over many decades.

As another striking example of this contradiction, two notable domestic terrorist attacks and a foiled plot occurred in 1995, all of them designed to target law enforcement officials--two involved WMD and the other relied on conventional explosives.

Viewed as a watershed attack by many experts, the Japanese cult group, Aum Shinrikyo, carried out a last-minute attack in March 1995 against the Tokyo subway with a crude dispersal of sarin nerve agent. The group had become aware of an impending police raid on their facilities and decided to target the Tokyo Metropolitan Police Department.<sup>33</sup> They timed their attack around the morning shift change for the police in the hopes of foiling the planned search. Thirteen people died from exposure to sarin gas, and thousands were injured. Subsequent investigations into Aum Shinrikyo's WMD-related activities revealed that despite the group's vast membership, extensive financial resources and facilities, its motivation to cause mass destruction, and its access to biological and chemical technical expertise within the group, it was largely unsuccessful in its efforts to use WMD as desired.

About one month later, a few anti-government, white supremacists led by Timothy McVeigh, detonated a truck full of conventional explosives outside the Alfred P. Murrah Federal Building in Oklahoma City, killing 168 people and injuring hundreds more.<sup>34</sup> At the time, the attack constituted the deadliest terrorist attack on U.S. soil. During the same timeframe, the Minnesota Patriots Council, an anti-government group with a similar ideology to McVeigh, were arrested for producing ricin from a supply of castor beans with the intent to target law enforcement officials. They were caught and prosecuted before implementing their plot. Although the group had extracted enough ricin to kill as many as 129 people, their chosen method of delivery (contaminated door knobs or shoes) would have only injured a few targeted individuals.<sup>35</sup>

Despite these contradictions, U.S. policymakers continued to view WMD terrorism as a much more significant threat than attacks by other means, in part due to a professed interest in WMD by other terrorist groups such as al Qaeda and the Islamic State. Both groups enjoyed access to a safe haven and vast resources. Over many years, they also failed to carry out a WMD attack resulting in mass destruction and mass casualties.<sup>36</sup>

The 9/11 terrorist attacks, masterminded by Osama bin Laden and al Qaeda leadership, represented the most devastating terrorist incident in U.S. history. It defied the imaginations of national security experts. It quickly caused mass death and horrific devastation, far outside the classification of WMD. Indeed, the primary tools used in the attack were not weapons at all, but used tactically as such and to lasting strategic

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<sup>32</sup> William Morgan Alley and Jessica L. Jones, "An Analysis of the Threat of Malicious Chemical Use by Nonstate Actors: Questioning the State-Based Approach to Chemical Nonproliferation," *The Nonproliferation Review*, vol. 22, no. 3-4 (April 2016).

<sup>33</sup> Richard Danzig et al, [Aum Shinrikyo: Insights into How Terrorists Develop Biological and Chemical Weapons](#), 31-32.

<sup>34</sup> FBI, "[Oklahoma City Bombing.](#)"

<sup>35</sup> Jonathan B. Tucker and Jason Pate, "The Minnesota Patriots Council," in Jonathan B. Tucker, ed., *Toxic Terror: Assessing Terrorist Use of Chemical and Biological Weapons*, Cambridge, MA: MIT Press, 2001, 174.

<sup>36</sup> Osama bin Laden asserted that acquiring weapons of mass destruction was a religious duty in an [interview with Time Magazine](#) in 1998.

effect. This attack should have opened the eyes of U.S. policymakers and the general public to the growing range of options for causing mass effects. Instead, the U.S. enhanced its focus on terrorist use of CBRN--a significant concern, but not the only one on the near-term horizon.

Debates continue today over why al Qaeda has not yet succeeded in carrying out a WMD attack.<sup>37</sup> In investigating al Qaeda's activities, the *9/11 Commission Report* determined that any terrorist group would require a safe haven and substantial resources to facilitate the successful planning of a complex operation, including any effort to develop WMD.<sup>38</sup>

Compared to other groups, al Qaeda had ample opportunity for long-term operational planning, afforded by the permissive environment of the Taliban-led Afghanistan. In the years leading up to the 9/11 attack, al Qaeda managed to develop a rudimentary biological weapons program and gained access to expertise related to nuclear weapons.<sup>39</sup> Since 2001, however, most al Qaeda-associated jihadist efforts to acquire and use WMD have focused on crude, small-scale chemical and biological attacks.<sup>40</sup>

Abu Musab al-Zarqawi, the former leader of al Qaeda in Iraq and founder of the Islamic State, asserted his strong desire to gain access to WMD as early as 2004.<sup>41</sup> For several years, it appeared that the Islamic State might be well-positioned to develop WMD since the group controlled vast swaths of territory in Iraq and Syria and had access to potential expertise and infrastructure.<sup>42</sup> Islamic State leadership took steps toward developing and using WMD during its insurgency.<sup>43</sup> By one analysis, on at least 76 occasions between 2014 and 2017, the Islamic State used sulphur mustard, chlorine, and other chemicals, often to support battlefield operations in Syria and Iraq.<sup>44</sup> Additionally, in at least one example, the Islamic State used sulphur mustard and chlorine against the civilian population of Taza in 2016, injuring 600 people and 35 critically.<sup>45</sup> Today, the Islamic State has lost control of its former territory, leading to a significant degradation in its capabilities to develop WMD and to carry out other activities. In the aftermath of its terror, U.S. policymakers are left with significant questions about the character of WMD terrorism and what shape efforts should take to counter it.<sup>46</sup>

There are any number of possible explanations for the lack of WMD terrorism attacks over the past three decades. The requirements for a complex operation proposed by the *9/11 Commission Report* may be the key impediment to success. Moreover, it is not a given that all violent non-state actors will devote the time and resources to developing CBRN at the expense of other less risky options. More often than not, violent non-state actors will turn to their tried-and-true methods of killing people--coordinated attacks with guns and bombs. When assessing the CBRN threat from al Qaeda in 2008, Director of National

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<sup>37</sup> Rolf Mowatt-Larssen, [Al Qaeda Weapons of Mass Destruction Threat: Hype or Reality](#).

<sup>38</sup> National Commission on Terrorist Attacks, [The Final Report of the National Commission on Terrorist Attacks Upon the United States "The 9/11 Commission Report"](#), Washington D.C.: 2004.

<sup>39</sup> Rolf Mowatt-Larssen, [Al Qaeda Weapons of Mass Destruction Threat: Hype or Reality](#).

<sup>40</sup> For a comprehensive exploration of jihadist interest in and efforts to develop and use WMD, see Gary Ackerman and Jeremy Tamsett, eds., *Jihadists and Weapons of Mass Destruction*, Boca Raton, FL: CRC Press, 2014.

<sup>41</sup> ["Al-Qaeda denies Jordan WMD plot," BBC News](#), 30 April 2004.

<sup>42</sup> ["Islamic State and the crisis in Iraq and Syria in maps," BBC News](#), 28 March 2018.

<sup>43</sup> Stephen Hummel, ["The Islamic State and WMD: Assessing the Future Threat," CTC Sentinel](#) 9, no. 1 (2016),

<sup>44</sup> Columb Strack, ["The Evolution of the Islamic State's Chemical Weapons Efforts," CTC Sentinel](#) 10, no. 9 (2017),

<sup>45</sup> <https://www.bbc.com/news/world-middle-east-35898990>

<sup>46</sup> Eric Schmitt, Thomas Gibbons-Neff, Helene Cooper and Alissa J. Rubin, ["Its Territory May Be Gone, but the U.S. Fight Against ISIS Is Far From Over," New York Times](#), 24 March 2019.

Intelligence, J. Michael McConnell, argued that the group was most likely to use conventional explosives in future attacks.<sup>47</sup>

There may also be a specific profile of violent non-state actor groups which are specifically attracted to WMD (e.g., Aum Shinrikyo) as a means for causing mass casualties. Whilst any terrorist group bent on causing mass casualties may be likely to use WMD should they gain access to one, it is less clear under what conditions a group would be willing to devote the resources to achieve an indigenous CBRN capability.<sup>48</sup> Given the operational risks from handling CBRN materials, some terrorist experts suggest that jihadists “will not invest substantial money, personnel, and other resources toward the acquisition and use of weapons whose strategic benefits are questionable.”<sup>49</sup> In addition, it is a common mistake to assume that terrorists interested in WMD are seeking to bring about mass destruction at all. One terrorist expert suggests that “in most cases, it was *not* the desire to produce mass casualties that led the respective perpetrators to adopting [CBRN] as their weapon of choice.”<sup>50</sup> Other features of CBRN made them attractive for operations including their clandestine nature, the difficulty of attribution, and their disproportionate capacity to trigger fear.

Rather than turn to WMD, today’s terrorists may innovate in other ways to achieve strategic impact and cyber, social media, drones, and other more accessible technologies to support their violent attacks.<sup>51</sup> A new “species” of emerging technologies—additive manufacturing, advanced robotics, artificial intelligence, and synthetic biology—may empower these groups to acquire capabilities previously beyond their reach.<sup>52</sup> While more accessible and easier to use than CBRN, a number of potential scenarios involving these technologies could cause mass effects, presenting yet another challenge to the WMD paradigm. However, such topics have not yet garnered systematic attention at the highest echelons of the U.S. government.

### *State Actors*

In recent decades, a number of state actors have pursued WMD programs for a variety of reasons including Iraq, Libya, Syria, North Korea, and Iran—such trends were a key factor in the adoption of the WMD paradigm by U.S. policymakers in the decade following the end of the Cold War. Beyond their use as a deterrent vis-a-vis nuclear-weapon states and other military intervention, however, there have been fewer than expected instances of actual use of WMD by states. Across all of these use cases, motivations

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<sup>47</sup> J. Michael McConnell, [“Annual Threat Assessment of the Director of National Intelligence.”](#) *Testimony for the Senate Select Committee on Intelligence*, February 5, 2008.

<sup>48</sup> Adam Dolnik, “13 Years Since Tokyo: Revisiting the ‘Superterrorism’ Debate,” *Perspectives on Terrorism*, vol II, no 2 (January 2008).

<sup>49</sup> James J.F. Forest and Sammy Salama, “Jihadist Tactics and Targeting,” in Gary Ackerman and Jeremy Tamsett, eds., *Jihadists and Weapons of Mass Destruction: A Growing Threat*, Taylor & Francis (Auerbach Publications), December 2008.

<sup>50</sup> Adam Dolnik, “13 Years Since Tokyo: Revisiting the ‘Superterrorism’ Debate,” *Perspectives on Terrorism*, vol II, no 2 (January 2008).

<sup>51</sup> See, for example, Gary Ackerman and Michelle Jacome, [“WMD Terrorism: The Once and Future Threat.”](#) *PRISM* 7, no. 3 (2018): 22-36; Don Rassler, [“The Islamic State and Drones](#), Combating Terrorism Center, West Point, July 2018; Gary Ackerman, [“Designing Danger: Complex Engineering by Violent Non-state Actors.”](#) *Journal of Strategic Security* 9, no. 1 (2016): 1-11; Seth Harrison, [“Evolving Tech, Evolving Terror.”](#) *New Perspectives in Foreign Policy*, Issue 15, 22 March 2018.

<sup>52</sup> Jennifer J. Snow, [“Entering the Matrix: The Challenge of Regulating Radical Leveling Technologies](#), Monterey: Naval Post Graduate School, 2015; see also, Natasha E. Bajema, [“WMD in the Digital Age: Understanding the Impact of Emerging Technologies](#), Research Paper No. 4, Washington D.C.: National Defense University, 2018.

for WMD use appear to have often been more for motivations other than their potential to cause mass casualties.

In recent years, Syria has been the only nation to use WMD in the more traditional sense, engaging in chemical attacks against its own population starting in December 2012.<sup>53</sup> Repeated use of chemical agents including mustard and sarin against its own civilian population led the international community to threaten military intervention. The U.S. and a coalition of other countries demanded that Syria accede to the CWC and destroy its entire chemical weapons stockpile in a verified manner. In collaboration with the OPCW and the international community, the U.S. destroyed Syria's declared chemical weapons stockpile on the U.S. ship, *Cape Ray*, whilst located off the coast of Italy.

Toward the end of this historic operation in 2014, however, evidence began to surface that Syria was again using chlorine and other agents to target its civilian population as part of its ongoing civil war. A recent study tallied the impact of 336 confirmed chemical attacks in Syria, 98 percent of which were attributed to the Assad regime.<sup>54</sup> The authors found that Syria's use of chemical weapons was part of a broader strategy of indiscriminate violence against population centers in opposition-held areas in order to terrorize and punish innocent civilians. For example, the Assad regime is believed to have killed an estimated 594,000 people.<sup>55</sup> <sup>56</sup> In other words, Syria used chemical weapons to kill specific populations and for their psychological impact.

Using the current definition of WMD, other known uses by states over the past three decades include suspected use by North Korea and Russia. These instances were targeted assassination attempts and occurred below the threshold of traditional military operations in what is called gray zone warfare.

In 2017, Kim Jong Nam, the half-brother of North Korea's authoritarian leader, Kim Jong Un, was assassinated with VX nerve agent in the Kuala Lumpur airport on his way to Macau. The use of VX suggests the direct involvement of the North Korean government and appears to confirm the existence of its suspected chemical weapons program.<sup>57</sup> A year later, in the spring of 2018, Russia is suspected to have used a Novichok chemical agent in Salisbury, United Kingdom in a failed assassination attempt of a former Russian spy and his daughter. Brief exposure to the nerve agent hospitalized the intended targets, killed an innocent bystander, and sickened four others including two police officers.<sup>58</sup> As discussed in the first briefer in this series, Russia is also suspected in the recent attempted assassination of Russian dissident Alexei Navalny with a Novichok chemical agent.<sup>59</sup>

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<sup>53</sup> [“Timeline of Syrian Chemical Weapons Activity,”](#) Washington D.C.: Arms Control Association, 2020.

<sup>54</sup> Tobias Scheider, Theresa Lütkefend, and Inji El Bakry, [“The Scale and Logic of Chemical Weapons Use in Syria.”](#) Berlin, Germany: Global Public Policy Institute, 2020.

<sup>55</sup> Syrian Observatory for Human Rights, [“A Decade of Syrian Revolution,”](#) March 14, 2021.

<sup>56</sup> See Tobias Scheider and Theresa Lütkefend, [Nowhere to Hide: The Logic of Chemical Weapons Use in Syria.](#) Berlin, Germany: Global Public Policy Institute, 2019.

<sup>57</sup> James Griffiths and Salhan Ahmad, [“Kim Jong Nam had antidote to VX nerve agent on him at time of murder.”](#) *CNN*, 1 December 2017. For an overview of North Korea's chemical and biological weapons capabilities, see John Parachini, [“Assessing North Korea's Chemical and Biological Weapons Capabilities and Prioritizing Countermeasures,”](#) Testimony presented before the House Foreign Affairs Committee, Subcommittee on Terrorism, Nonproliferation and Trade, and the Subcommittee on Asia and the Pacific, 17 January 2018.

<sup>58</sup> Simon Murphy, [“Met confirms second police officer was victim of Salisbury attack.”](#) *The Guardian*, 15 August 2019.

<sup>59</sup> The use of VX by North Korea and the Salisbury attack were not the first assassination attempts carried out by a government in broad daylight using WMD, and not the last. Most notoriously, in 1978, the Soviet KGB and Bulgarian secret police are believed to have coordinated the operation to assassinate Georgi Markov, a Bulgarian

The repeated use of Novichok agents is significant for a number of reasons.<sup>60</sup> These cases represent the first publicly-known uses of such agents. The use of a nerve agent in a public space is particularly brazen given its potential for contamination and unintended effects. If the incidents were carried out by the Russian government, then they also represent violations of the Chemical Weapons Convention (CWC), and a further erosion of the norm against the use of chemical weapons and other norms against assassinations. The choice of weapon in the cases of both Russia and North Korea is also particularly interesting given that there are many less prominent means of assassination. Despite difficulties in attribution, the use of chemical agents provides deliberate signals about the identity of the responsible party. These cases beg the question about the extent to which North Korea and Russia were simply capitalizing on the priority given to WMD.

Though rather significant in terms of their media impact and need for thorough decontamination, none of these chemical attacks against individual targets meet the generally-accepted criteria of mass casualties or mass destruction associated with WMD.<sup>61</sup> Each of these incidents were highly publicized and led to responses by U.S. policymakers and sustained interest by the general public about the threat posed by WMD. Yet the point is a significant need to better define and understand these threats.

### *Utility of the WMD Paradigm*

Over the past three decades, the use of CBRN-related materials has been treated as analogous to mass-casualty WMD events by U.S. policy makers and the news media, even when casualties are more limited.<sup>62</sup> In other words, CBRN weapons have significant strategic impact even at the lowest end of their destruction/casualty spectrum. Yet, most of the tools for countering WMD were designed to address use at the higher end of the spectrum.

The record of CBRN use by both states and violent non-state actors begs several questions. Are WMD still attractive to violent non-state actors for their potential to achieve mass destruction? Or are nefarious actors most likely to resort to WMD in order to exploit their psychological effects and resulting media coverage? Can violent non-state actors find the necessary space, time and resources to develop WMD to achieve mass casualties and destruction? Or will violent non-state actors seeking to cause mass casualties choose instead to innovate with more accessible and easy-to-use technologies that are not currently considered part of the WMD paradigm (e.g., drones and/or fentanyl)? Will states more often consider less attributable means of ensuing mass chaos and instability than WMD in the future?

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dissident and Communist defector, with a ricin pellet inserted in the pointy tip of an umbrella. Several decades later, in 2006, Russian agents were implicated in the assassination of Alexander Litvinenko, a former Russian spy, with a microgram amount of the radioactive isotope, polonium-210. For an overview of existing evidence of this incident, see Nate Jones, [“The Poisonous Umbrella and the Assassination of Georgi Markov,”](#) *Unredacted: The National Security Archive Blog*, 16 July 2010. There are earlier documented examples of Soviet chemical assassinations. See Shlomo Shpiro, [“Poisoned Chalice: Intelligence Use of Chemical and Biological Weapons,”](#) *International Journal of Intelligence and CounterIntelligence* 22, no. 1 (2008): 1–30. For a thorough examination of the Litvinenko case, see [The Litvinenko Inquiry: Report into the Death of Alexander Litvinenko](#), Presented to Parliament pursuant to Section 26 of the Inquiries Act 2005, Ordered by the House of Commons to be printed on 21 January 2016.

<sup>60</sup> Peter R. Chai, Bryan D. Hayes, Timothy B. Erickson, and Edward W. Boyer, “Novichok Agents: A Historical, Current, and Toxicological Perspective,” *Toxicology Communications* 2, no. 1 (2017): 45-48. <https://www.tandfonline.com/doi/full/10.1080/24734306.2018.1475151>

<sup>61</sup> Lauren Said-Moorhouse and Samuel Quashie-Idun, [“Salisbury declared Novichok-free nearly a year after nerve agent attack.”](#) *CNN*, 1 March 2019.

<sup>62</sup> Morgan Chalfant and John Bowden, [“Trump imposes new sanctions on Russia over chemical weapons use.”](#) *The Hill*, 2 August 2019.

Do these trends matter for U.S. national security strategy?

Today, cyber weapons offer a powerful and often more accessible means to cause mass destruction than what are currently considered WMD, for both states and violent non-state actors. And although such attacks do not fit within the WMD paradigm, they can exert relevant effects given complex convergences across existential threats. Consider, for example, the vast consequences of the NotPetya attack several years ago.

On June 27, 2017 a malicious form of ransomware spread quickly across Europe, emanating from the Ukraine and infecting tens of thousands of computers around the world.<sup>63</sup> The “NotPetya” program irreversibly encrypted the master boot records of infected computers and rendered the machines permanently useless.<sup>64</sup> And so, what started as a local malware attack by Russian hackers against accounting software produced by a Ukrainian family-run business ended up shutting down the global operations of the Maersk shipping company and causing major traffic congestion on the roads near ports in the United States, among many other surprising consequences.<sup>65</sup>

It is estimated that the NotPetya attack cost more than ten billion dollars in physical and digital damages around the world.<sup>66</sup> Entering into the countering WMD realm, the attack significantly disrupted the operations of Merck & Co, Inc., a major producer of drugs and vaccines in the U.S. The attack may have reduced the capacity of the United States for responding to a biological attack or a naturally-occurring pandemic for a short period of time, which could have had devastating effects.<sup>67</sup> On the day after the attack, Merck expressed its confidence in being “able to maintain a continuous supply of its top-selling and life-saving drugs...But it warned of temporary delays in delivering some other products, which it did not identify.”<sup>68</sup>

Despite costing billions of dollars in economic damages, the NotPetya attack did not cause direct physical destruction or human casualties. Even if it had done so, such an attack would not be considered a WMD under the current paradigm. The NotPetya attack also does not appear to have changed the views of the general public about the growing risks of cyber vulnerabilities, increased their concern about security gaps, or stirred governments of developed nations into action. Whereas the general public’s attention span for the NotPetya attack disappeared rapidly, ongoing concern about the use of WMD continues to remain high.<sup>69</sup>

Although the term WMD was not intended to be rigid, the WMD paradigm that emerged over time has limited how U.S. policymakers think about threats with potential for mass effects. It has encouraged them

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<sup>63</sup> Danny Palmer, [“Petya ransomware attack: How many victims are there really?”](#) *ZDNet*, 28 June 2017.

<sup>64</sup> Iain Thomson, [“Everything you need to know about the Petya, er, NotPetya nasty trashing PCs worldwide.”](#) *The Register*, 28 June 2017.

<sup>65</sup> Andy Greenberg, [“The Untold Story of NotPetya, the Most Devastating Cyberattack in History.”](#) *Wired Magazine*, 22 August 2018.

<sup>66</sup> *Ibid.*

<sup>67</sup> Eric Palmer, [“Merck has hardened its defenses against cyberattacks like the one last year that cost it nearly \\$1B.”](#) *FiercePharma.com*, 28 June 2018.

<sup>68</sup> Michael Erman and Jim Finkle, [“Merck says cyber attack halted production, will hurt profits.”](#) *Reuters*, 28 June 2017.

<sup>69</sup> BBC recently announced a two-part drama on the Salisbury incident, inspired by the story of “how ordinary people reacted to a crisis on their doorstep, displaying extraordinary heroism.” See [“BBC to dramatise Salisbury Novichok poisoning.”](#) *BBC News*, 17 May 2019.

to narrow their focus and prioritize CBRN materials that fit within current definitions to the exclusion of other relevant materials (e.g., fentanyl), new technologies (e.g., drones, cyberweapons), and complex scenarios (e.g., disruption of infrastructure) that have similar mass casualty/mass destruction potential as WMD, but may be becoming more attractive to states and violent non-state actors for causing strategic impact. It has prevented U.S. policymakers from considering complex convergences across different existential threats that may be exploited by malicious actors to achieve mass effects.

The WMD paradigm has educated the general public on where to direct their concerns; they may be caught off-guard and lose faith in the government in the event of a failure of imagination.

Finally, the current WMD paradigm fails to consider the use of CBRN at the lower end of the mass casualty/mass destruction spectrum and devise approaches to address these events and prevent damage to international norms against their use. Although CBRN emerged during a period in history where the leaders of states thought in terms of mass destruction and mass casualties, the record of use since 1990 demonstrates that the perceived ideal utility of CBRN may have shifted.

## Conclusion

For U.S. national security strategy, definitions matter. They identify key priorities, budgets and personnel. They determine how a government is organized to address emerging threats. Although CBRN continue to be of significant concern for U.S. national security, the WMD paradigm needs to adapt or risk exceeding its utility for defining the top threats to U.S. national security in the 21<sup>st</sup> century.

The WMD paradigm has become deeply embedded in bureaucratic structures and standard operating procedures. It has limited the ability of U.S. policymakers to think outside the box and to consider new threats that could cause significant harm and destruction. This inertia prevents priority consideration from being given to threats with the potential to cause mass destruction that do not fit the definition of WMD. If U.S. policymakers carry on business as usual, they may run the risk of another failure of imagination on par with 9/11.

As a next step in avoiding this, U.S. policymakers need to move beyond the WMD paradigm as an organizing principle and start thinking more broadly about mass effects. In the next brief in this series, I will propose a framework and a set of criteria for determining potential technologies and scenarios with mass effects potential, including CBRN, and assigning relative priority to them.

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