
Syria and Beyond

The Future of the Chemical Weapons Threat

Richard Weitz

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Security Studies Center

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Abstract

The use of chemical weapons (CW) in Syria and the decision to award the 2013 Nobel Peace Prize to the Organization for the Prohibition of Chemical Weapons (OPCW) reminded the international community that these weapons continue to represent a serious threat. The number of incidents of chemical attacks has been increasing in recent years, and efforts to curb CW programs – apart from the joint mission in Syria – have generally proven unsatisfactory. This paper attempts to clarify our understanding of this threat, starting from the enduring rationale for states and non-state actors to acquire CW as means of deterrence and terror, against perceived external and internal threats. It reviews the strengths and weaknesses of the regime established by the Chemical Weapons Convention (CWC) and offers recommendations to reinforce our ability to prevent further proliferation and better deal with issues of noncompliance. It finally highlights lessons from the Syrian case of coercive disarmament in terms of strategic credibility and enforcement of disarmament measures in a civil war context.

* * *

L'emploi d'armes chimiques en Syrie et la décision de décerner le Prix Nobel de la Paix de 2013 à l'Organisation pour l'interdiction des armes chimiques (OIAC) ont rappelé à la communauté internationale que les armes chimiques constituent toujours une menace significative. Le nombre d'attaques chimiques a augmenté au cours des dernières années, et les efforts fournis pour freiner les programmes d'armes chimiques – à l'exception de la mission conjointe en Syrie – se sont généralement avérés insatisfaisants. Cet article contribue à clarifier notre compréhension de cette menace, en commençant par exposer les motivations amenant des acteurs étatiques et non-étatiques à acquérir des armes chimiques à des fins de dissuasion ou de terreur face à des menaces internes ou externes. Il examine les points forts et faibles du régime mis en place par la Convention sur l'interdiction des armes chimiques (CIAC), et présente des recommandations en vue de renforcer notre capacité à empêcher la prolifération chimique dans l'avenir, et de mieux répondre aux cas de violations. Enfin, il met en avant les leçons tirées du désarmement coercitif de l'arsenal chimique syrien, en termes de crédibilité stratégique et de mise en œuvre des mesures de désarmement dans un contexte de guerre civile.

Introduction

The decision to award the 2013 Nobel Peace Prize to the Organization for the Prohibition of Chemical Weapons (OPCW) is both a tribute to that institution's tireless efforts to rid the world of these horrendous weapons as well as a manifestation that these chemical weapons (CW) still threaten international security. Indeed, the number of incidents of chemical attacks has been increasing in recent years – demanding that we understand this threat better as well as strengthen our defenses against it.

At present, the OPCW is struggling with numerous difficult missions around the globe. Furthermore, it has to manage these missions with a budget that has been frozen at \$100 million for years, using obsolete equipment, and a skilled but aging staff of a few hundred highly trained specialists. The reduced demands for the OPCW's very expensive disarmament activities perhaps made cuts unavoidable, especially given the poor health of the world economy, but they risk depriving the world of some of the most experienced CW experts at a time of increased threat of CW use. The OPCW staff is currently overseeing the complex process of CW destruction and dismantlement within Russia, the United States, and numerous other countries. It is also trying to induce all 190 Chemical Weapons Convention (CWC) member States to fulfill their obligations to supply the OPCW with essential data, and to enact stronger national safety and security regulations; while trying to entice a few remaining states of proliferation concern to join the convention. The OPCW is also busy expanding cooperation with other international institutions and private companies; while monitoring chemical sales and scientific developments to avert new proliferation threats. Although the Nobel Prize and largely successful Syrian case have raised the organization's profile and expanded its resources, the chemical nonproliferation enterprise will require more help to meet current and future challenges. Even with the anticipated elimination of the Syrian, Libyan, and eventually Russian and U.S. CW arsenals during the next decade, the threat of CW use, by both state and non-state actors, is likely to persist.

The strategic value of chemical weapons is not as clear-cut as other forms of military technology: the possession of the weapons often serves as a form of deterrence, and the actual use of chemical weapons, although its military value is dubious against regular armies, is frequently intended to terrorize the target populace or to dislodge an irregular adversary in an urban environment. Moreover, among states that do not have the resources to develop a nuclear arsenal, chemical weapons are sometimes perceived as a suitable equalizer, thereby earning the title "the poor man's atomic bomb." The OPCW-UN joint mission has succeeded in eliminating a large

number of chemical weapons in Syria. President Bashar al-Assad's use of chemical agents in the civil war and the subsequent multilateral efforts to destroy the weapons offer crucial lessons for the nonproliferation regime. Even so, the threat of chemical attacks and proliferation to terrorist groups remains. In addition to longstanding efforts by al-Qaeda to acquire WMD, the group known as the Islamic State, ISIL, or ISIS poses a new non-state CW threat, both directly and through its growing network of international admirers and affiliates.

While several states remain outside of the CWC and some non-nuclear states seek to deter potential rivals by acquiring chemical weaponry, technological advances facilitate the production of chemical agents, thereby increasing the likelihood of the weapons falling into the hands of terrorists. The global threat of the proliferation and use of chemical weapons is still very real. In order to confront the threats that characterize the 21st century, the OPCW and the CWC must adapt, States Parties must mandate stricter compliance to the CWC and enforce punitive measures when necessary, and the OPCW should intensify its efforts to combat proliferation to terrorist groups and it should respond to credible threats as early as possible. In order to uphold the influential norm against this abhorrent form of weaponry, our institutional mechanisms must learn from current crises and adapt accordingly.

The Persistent Value – and Threat – of Chemical Weapons

It has been over a century since the world first witnessed the true horror of chemical weapons. Starting in World War I, and continuing throughout much of the 20th century, a wide variety of dangerous chemicals – in liquid, gas, or solid form – have been developed and occasionally used as weapons. Depending on their properties, these agents can cause blistering, choking, or lacrimation resulting in the disruption, damage, or failure of numerous human organs leading to either incapacitation or death. Common groups of CW include nerve agents, mustard agents, hydrogen cyanide, tear gases, arsines, psychotomimetic agents, and toxins.¹

Strategies of Deterrence and Terror

The widespread popular revulsion regarding the effects of chemical weapons led to movements to ban them. The first successful international agreement to ban the use of CW during conflict was the 1925 Geneva Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare. The Protocol prohibits the use of CW, including lachrymatory, irritant or vesicant substances, as well as bacteriological weapons. It also prohibits the manufacture, import, export, or possession of equipment necessary for the conduct of chemical warfare. The Protocol does allow each state party the right to possess CW defenses. The Geneva Protocol was ineffective in its application due to its inability to be enforced, especially during internal conflicts, and the omission of a mechanism to verify compliance or clarify ambiguous situations.² Nevertheless, no major European power has used CW since World War I. Both the indiscriminate and inhuman nature of CW, and the mutual deterrence that *de facto* exists between states possessing large stockpiles of CW, have played a role to prevent such a use. However, during the 1930s and 1940s, Italy and Japan readily employed them against countries, such as Ethiopia and China, which lacked any

¹ Common types of chemical weapons include: (1) chemicals that blister: sulphur mustard, lewisite, nitrogen mustard, mustard-lewisite, phosgene-oxime; (2) chemicals that affect the nerves: VX, Sarin, Soman, tabun, novichole agents; (3) chemicals that cause choking: chlorine, phosgene, diphosgene, chloropicrin; (4) chemicals that affect the blood: herygem, cyanide, cyanogens chlorine; (5) chemicals for riot control: tear agents and psychedelic agents; “Chemical Weapons,” Women’s International League for Peace and Freedom, 2008, available at: <http://www.reachingcriticalwill.org/legal/cw/cwindex.html>.

² Jozef Goldblat, *Arms Control: The New Guide to Negotiations and Agreements*, London, Sage Publications Ltd, 2002, pp. 25-27.

means of retaliating in kind. Although the countries of the North Atlantic Treaty Organization (NATO) and the Soviet Bloc developed CW during the Cold War, they also improved their chemical defense capabilities. More importantly, the advent of more destructive nuclear and then more accurate conventional weapons led these great powers to conclude that CW were of dispensable military value. After the Cold War, the declining military utility of CW for the world's most powerful countries, combined with the increased fears about the potential for further proliferation of dangerous CW agents and technologies to rogue states or terrorist groups, led the international community to commit to their elimination. After decades of negotiations in the Conference on Disarmament in Geneva on the text, the logjam suddenly broke. On November 30, 1992, the UN General Assembly adopted the CWC (A/RES/47/39).³

The Convention, which bans the development, production, acquisition, stockpiling, transfer, and use of offensive CW, including the employment of riot control agents as a means of warfare, remains a powerful legal instrument against CW use by nation states. Its State Parties are prohibited from threatening, or engaging in, military preparations to employ chemical weapons. Application of these provisions is universal. The Convention is of indefinite duration and aims for comprehensive coverage of all global activities potentially related to chemical weapons. Its regulations encompass both government and private sector activities as well as storage, production and destruction facilities. Of the 193 nation states recognized by the UN, 190 countries have joined the convention.

CW have always been of questionable military value. Despite the ubiquitous nature of CW technology and agents, there has been a great disparity between the number of countries that have developed and possessed CW and the number of national militaries that have used them. Since the 1920s, CW have been used only by the governments of Italy, Japan, Egypt, Iraq, Germany, and most recently Syria.⁴ This paucity can be explained by nations acquiring them as a means of deterrence rather than as a strategic weapon. In addition, nuclear deterrence, most often provided by the United States through extended deterrence guarantees, and the proliferation of ballistic missile technology has resulted in almost all governments losing interest in maintaining an environmentally costly and morally suspect CW stockpile.

However, although CW are often seen as a lesser threat than biological or nuclear weapons, it must not be forgotten that they are the only form of WMD that has been employed by national governments since World War II. Notwithstanding some positive developments, the number of incidents of CW use has actually increased during the past few decades. For a few states, such as Libya and Iraq, which lacked reliable allies, CW

³ The text of the convention is available from the OPCW website: <http://www.opcw.org/chemical-weapons-convention/>.

⁴ Glenn Kessler, "Kerry's claim that only three 'tyrants' have used chemical weapons," *The Washington Post*, 5 September 2013, available at: <http://www.washingtonpost.com/blogs/fact-checker/wp/2013/09/05/kerrys-claim-that-only-three-tyrants-have-used-chemical-weapons/>.

were the best substitute for nuclear weapons. Nuclear weapons are more economically costly and diplomatically difficult to acquire than chemical weapons. In addition, CW can be cheap, impact a large area, and do not necessarily require an advanced commercial chemical industry to produce.

Moreover, national governments facing potential ethnic unrest or separatism may still value chemical weapons as a means of inflicting mass casualties on rebels as well as intimidating or punishing their civilian supporters. Until recently, the international community had generally not held these governments accountable for these actions. For instance, the world looked the other way in the 1980s when Iraqi leader Saddam Hussein applied chemical weapons first against his Iranian adversaries and then against his own Kurdish minority. The lessons that will be drawn from the Syrian case by other states, on the other hand, are still unclear. It may have positive effect, showing how the use of chemical weapons against civilians can provoke international intervention, forcing the regime to abandon what was its best deterrent against Israel. On the other hand, a more pessimistic interpretation could point out to several areas of great concern: the chemical weapons elimination enterprise in Syria is far from complete, as the Assad regime has continued to use chlorine gas bombs.⁵ This banalized use of chemical agents, if combined with the perception that the Assad regime survived this episode with little in the way of retaliation, could even encourage further proliferation, all the more since the political and military circumstances that made this partial coercive disarmament credible may be extremely difficult to reproduce.

Of increasing concern is the threat posed from the ubiquitous and widely available nature of CW agents and equipment. This has increased the risk of further CW use by rogue regimes, terrorists, or crime syndicates. For example, a billion pounds of phosgene, a chemical weaponized during World War I, are consumed each year in the United States in the production of plastics. American companies also manufacture yearly over 300,000 metric tons of cyanide, a potentially lethal chemical compound that is used in peaceful industrial processes.⁶ Many other countries possess industries capable of producing large quantities of such chemicals. Additionally, poorly secured caches of weaponized chemical compounds in the states of the former Soviet Union offer potential weapons to terrorist organizations, criminal groups, or rogue regimes. A large number of these commercial chemical activities and products, including some industrial chemicals, are inherently dual-use, having the potential for military as well as civilian application. This makes tracking, monitoring, and safeguarding these compounds from misuse extremely difficult.

⁵ "OPCW Fact Finding Mission: 'Compelling Confirmation' That Chlorine Gas Used as Weapon in Syria," OPCW, 10 September 2014, available at: <http://www.opcw.org/news/article/opcw-fact-finding-mission-compelling-confirmation-that-chlorine-gas-used-as-weapon-in-syria/>.

⁶ "CW Terrorism Tutorial," James Martin Center for Nonproliferation Studies at the Monterey Institute for International Studies, 2009, available at: http://www.nti.org/h_learnmore/cwtutorial/chapter03_02.html.

The Changing Threat from Non-State Actors

While nation states can wield sophisticated chemical weapons, terrorists are more likely to use improvised chemical explosive devices, which can be produced with widely available chemicals and without CW expertise. Some insurgents in Iraq in 2007 used CW against Iraqi security forces and civilians as well as coalition troops. Despite their initial shock value, the Iraqi guerrillas eventually stopped using these chlorine bombs after they proved no more effective than conventional IEDs.⁷ Furthermore, terrorists could also attack or sabotage a chemical storage or manufacturing facility potentially dispersing dangerous chemical agents into the air. The CWC treats chlorine as a non-scheduled chemical due to its many legitimate commercial applications. Fortunately, while unsophisticated CW (such as blister and nerve agents) can easily be made with kitchen chemicals according to recipes available on the Internet, producing more sophisticated chemical agents such as sarin or VX nerve gas requires ingredients that are dangerous to work with and difficult to obtain.

The Japan-based Aum Shinrikyo cult undertook a large-scale program to develop WMDs during the early 1990s. Despite investing considerable resources, the cult was unable to develop nuclear or biological weapons. However, it did succeed in developing and using chemical weapons. The most prominent attack being on the Tokyo subways, which killed 12 people, while more than 5,000 people were exposed and hospitalized. This included 135 ambulance workers who were unprepared to respond to a nerve weapon attack and lacked adequate personal protective equipment. In this attack Aum followers carried a container of sarin into a subway station and then punctured it, allowing the gas to evaporate.⁸ According to one estimate, the cult had stockpiled sufficient sarin to kill more than four million people had it been optimally and fully employed.⁹ Furthermore, the death toll could have been much greater had Aum employed a more lethal form of sarin and used it more effectively.¹⁰

Thankfully, the main impediment to CW terrorism is that non-state actors face major difficulties in orchestrating an effective mass casualty attack using weapons. Unlike professional militaries, non-state actors normally lack the heavy weapons (such as missiles, bombs, and artillery

⁷ Alissa J. Rubin, "Chlorine Gas Attack by Truck Bomber Kills Up to 30 in Iraq," *The New York Times*, 7 April 2007, available at: www.nytimes.com/2007/04/07/world/middleeast/07iraq.html?_r=2&ref=world&oref=slogin&oref=slogin.

⁸ Jonathan B. Tucker, "Lessons from the Case Studies," in Jonathan B. Tucker (ed.), *Toxic Terror: Assessing Terrorist Use of Chemical and Biological Weapons*, Cambridge, Belfer Center for Science and International Affairs at the John F. Kennedy School of Government, 2000, p. 253.

⁹ Chris Schneidmiller, "Scientific Skills Can Be Used For and Against Terrorism, Former Top British Official Says," *Global Security Newswire*, 21 July 2008, available at: http://www.nti.org/d_newswire/issues/2008/7/21/922E4CEE-75A6-432B-80B9-4D3494745275.html.

¹⁰ Andy Oppenheimer, "The Threat of Chemical Weapons: Use by Non-State Actors," OPCW, 28 November 2008, available at: <http://www.opcw.org/news/news/article/the-threat-of-chemical-weapons-use-by-non-state-actors/>.

shells) and other sophisticated delivery or dispersal devices needed to weaponize and deliver deadly chemicals near a target. However, the terrorist group known as ISIS has recently obtained some of such delivery systems and shown interest in acquiring and using chemical weapons. In June 2014, ISIS took control of two bunkers in Iraq about 45 miles outside of Baghdad that held 2,500 degraded chemical missiles armed with sarin gas and other chemical agents.¹¹ In one of the compounds, called Bunker 13, there were 2,500 rockets filled with sarin and 180 tons of sodium cyanide – a precursor for the “warfare agent” tabun and a highly toxic chemical in its own right.¹² In the other location, Bunker 41, there were 2,000 empty artillery shells that were contaminated with mustard gas, over 600 one-ton containers with mustard gas residue, and heavily contaminated construction material.¹³ According to Hamish de Bretton-Gordon, a chemical weapons expert who helped provide proof of Assad’s use of chemical agents, the captured mustard gas would still be usable.¹⁴ Furthermore, ISIS may have taken control of a sarin gas production facility in Iraq after allying with Saddam Hussein’s former vice president Izzat Ibrahim al-Douri.¹⁵ Although the chemical agents in the two captured bunkers, which date back to the 1980s, have degraded and most likely cannot be used as designed, terrorists might be able to extract and reuse their toxic agents as well as parts of vast numbers of abandoned chemical weapons scattered throughout Iraq to assemble improvised chemical weapons for use in Iraq or other countries.¹⁶ There is also a possibility that the group may gain control of any Syrian chemical weapons that have been abandoned or hidden by the Syrian government from the OPCW-led elimination effort.¹⁷

Several chemical attacks by ISIS have been reported, although they are difficult to confirm. Three ISIS militants were reportedly killed by an explosion while filling a rocket with chlorine gas.¹⁸ According to Kurdish news agency Firat News, ISIS used chemical weapons in July against the

¹¹ Associated Press, “Isis seizes former chemical weapons plant in Iraq,” *The Guardian*, 9 July 2014, available at: <http://www.theguardian.com/world/2014/jul/09/isis-seizes-chemical-weapons-plant-muthanna-iraq>.

¹² “ISIS uses chemical weapons against army in Iraq,” *op. cit.*

¹³ “Iraq loses control of chemical weapons depot to ISIS militants,” *Russia Today*, 9 July 2014, available at: <http://rt.com/news/171388-iraq-loses-chemical-weapons-depot/>.

¹⁴ Karen Leigh, “What If ISIS Gets Its Hands On Chemical Weapons,” *Worldcrunch*, 25 August 2014, available at: <http://www.worldcrunch.com/syria-crisis/what-if-isis-gets-its-hands-on-chemical-weapons-/syria-iraq-islamic-state-chemical-weapons-assyad/c13s16850/#.VC7xJmddWul>.

¹⁵ F. Michael Maloof, “ISIS Scores Big with Iraqi WMDs,” *WND*, 19 June 2014, available at: <http://www.wnd.com/2014/06/isis-scores-big-with-iraqi-wmds/>.

¹⁶ C. J. Chivers, “The Secret Casualties of Iraq’s Abandoned Chemical Weapons,” *New York Times*, 14 October 2014, available at: <http://www.nytimes.com/interactive/2014/10/14/world/middleeast/us-casualties-of-iraq-chemical-weapons.html>.

¹⁷ Erin Banco, “Chemical Weapons Facilities In Syria Could Fall Into ISIS Hands,” *International Business Times*, 4 September 2014, available at: <http://www.ibtimes.com/chemical-weapons-facilities-syria-could-fall-isis-hands-1679270>.

¹⁸ Sharmila Devi, “ISIS May Resort to Chemical Attacks, Expert Warns,” *Rudaw*, 3 October 2014, available at: <http://rudaw.net/mobile/english/middleeast/iraq/03102014>.

Kurdish People's Protection Units in Syrian Kurdistan. While medical teams could not identify the exact chemical agents that were used, doctors reportedly found burns and white dots on the victims.¹⁹ In September, ISIS reportedly attacked Iraqi army personnel and civilians with chemical agents.²⁰ The National Iraqi News Agency also reported in September that ISIS used chlorine gas to kill 300 Iraqi soldiers in the Saqlawiyah region in Anbar province.²¹

The threat is not limited to only the Middle East, as Iraqi Prime Minister Haider al-Abadi claimed that his country's intelligence had uncovered an ISIS plot to carry out a terror attack in subways in New York and Paris,²² perhaps akin to the attack by Aum Shinrikyo. Hamish de Bretton-Gordon claims that ISIS could also use its captured chemical weapons as strategic leverage over the United States, similar to how the Assad regime kept other countries "at arm's length" with the chemical weapons destruction process.²³ Nevertheless, while officials in New York ramped up security in the city and news media propagated the reports from Iraq, U.S. law enforcement and intelligence agencies reassured the public that they could not confirm the reports.²⁴ Further, it is likely that Syria's remaining chlorine stockpiles will remain out of reach for ISIS as long as the Assad regime continues to guard its chemical arsenal for use against the regime's enemies. And it is unlikely that Assad will provide chemical weapons to ISIS, since the regime understands that they will eventually have to fight the militants, despite their temporary joint interest in eliminating certain rebel groups in Syria.²⁵

For most terrorists, there are easier ways to kill large numbers of individuals, including the use of suicide bombers or car bombs to terrorize populated areas. Nonetheless, for terrorists the most attractive feature of chemical attacks is that their shock and awe effect can be greater than both car bombs and suicide bombers. Terrorists do not necessarily need to kill large numbers of people to achieve their goal of intimidating and paralyzing communities. They measure success not in how many people they kill but

¹⁹ "YPG: ISIS used chemical weapons against Kurds in Syrian Kurdistan," *Kurd Net*, 14 July 2014, available at: <http://www.ekurd.net/mismas/articles/misc2014/7/syriakurd1279.htm>.

²⁰ "ISIS uses chemical weapons against army in Iraq," *One India*, 19 September 2014, available at: <http://news.oneindia.in/international/isis-uses-chemical-weapons-against-army-in-iraq-1525245.html>.

²¹ "Nujaiifi Condemns / Daash / crime in Saqlawiyah and Alsiger areas of Anbar," *National Iraqi News Agency*, 22 September 2014, available at: http://www.ninanews.com/english/News_Details.asp?ar95_VQ=HGLKDK.

²² Ronen Solomon, "ISIS' Threat: Chemical and Biological," *Israel Defense*, 28 September 2014, available at: <http://www.israeldefense.com/?CategoryId=484&ArticleID=3137>.

²³ Leigh, "What If ISIS Gets Its Hands On Chemical Weapons,?" *op. cit.*

²⁴ Steven A. Holmes, "The great American freakout," *CNN*, 1 October 2014, available at: <http://www.cnn.com/2014/10/01/politics/great-american-freakout/>.

²⁵ Alessandria Masi, "Does ISIS Have Chemical Weapons? A Year After Syrian Chemical Attack, Some Weapons Still Undeclared," *International Business Times*, 22 August 2014, available at: <http://www.ibtimes.com/does-isis-have-chemical-weapons-year-after-syrian-chemical-attack-some-weapons-still-1665942>.

how many they terrorize. For purposes of terrorizing others, lethal chemical agents like sarin can work better than conventional attacks. Conventional attacks tend to only last a second or two resulting in the destruction of a bus or building, whereas a CW attack can last much longer and will have an asymmetric impact. Various U.S. government and non-government experts have identified the United States as potentially vulnerable to terrorist attacks against chemical plants or rail tankers transporting toxic chemicals such as chlorine.²⁶ Another incentive for non-state actors is that the main institutional and legal defenses in this area were designed to counter the acquisition and use of CW by nation states; these instruments have yet to be fully modernized to surmount their Cold-War origins and address post-modern catastrophic terrorism.

In sum, chemical weapons can still be valued by state actors either for their strategic utility – as a deterrent and a substitute for a nuclear arsenal – or for their tactical utility, as the Assad regime has made it abundantly clear. The rationale behind the proliferation of chemical weapons among states, then, is likely to endure. Moreover, because of the ease of developing certain chemical agents and the possibility of caches being stolen, non-state actors may have access to weapons that are well-suited to the goals of terrorist organizations, as their ability to provoke fear in a populace is incomparably greater than their physical effectiveness. The acquisition of chemical weapons by terrorist groups should therefore be a key consideration for the nonproliferation regime.

²⁶ “National Planning Scenarios: Created for Use in National, Federal, State, and Local Homeland Security Preparedness Activities,” April 2005, available at: <http://media.washingtonpost.com/wp-srv/nation/nationalsecurity/earlywarning/NationalPlanningScenariosApril2005.pdf>; Eric Lipton, “U.S. Report Lists Possibilities for Terrorist Attacks and Likely Toll,” *The New York Times*, 16 March 2005, available at: <http://www.nytimes.com/2005/03/16/politics/16home.html>

Strengthening the Regime

Given the ever-present and highly attractive nature of CW for both regional powers and terrorist organizations like the Aum Shinrikyo cult, the current CWC regime needs to step up to the challenge of countering the threat of CW use and proliferation.

The OPCW is charged with administering and enforcing the CWC as its “arbiter and guardian,” but needs supplementary and reinforcing assets. Headquartered in The Hague, the OPCW comprises all the CWC State Parties, and has a mandate to implement the CWC provisions, including ensuring compliance and serving as a consultative forum for the State Parties. The OPCW Technical Secretariat administers the mandatory verification regime that applies to all CWC State Parties. The Organization reviews the declarations submitted by the member governments as specified in national reporting requirements. To verify this information, the Secretariat conducts continuous on-site monitoring of CW elimination activities, systematic on-site inspections of eliminated or converted Chemical Weapon Production Facilities, and potential short-notice “challenge” inspections solely to verify compliance with the convention.

In practice, CWC members have relied heavily on Executive Council interventions as well as bi-lateral diplomacy to clarify enforcement issues.²⁷ All inspections thus far have involved either on-site observation of the CW elimination activities and of the production facilities, or the routine monitoring of commercial chemical facilities to ensure that they do not engage in activities prohibited under the Convention. The OPCW’s inspections employ “managed access” procedures common to many arms control agreements containing on-site inspection mechanisms. These procedures aim to allow inspectors to conduct necessary activities (interview personnel, investigate samples, assess CW facilities, etc.) while safeguarding the legitimate proprietary and national security information of the inspected party. When a State Party to the Convention is thought to be violating its provisions, other members have the right to demand a “challenge” inspection, which all parties to the Convention are obliged to accept. To this day, however, the OPCW has never conducted a challenge inspection. The OPCW is also authorized to conduct investigations of

²⁷ Tehal Chandan and Ramesh Thakur, “The Chemical Weapons Convention: Implementation, Challenges, and Opportunities,” *United Nations University Policy Brief*, No. 8, 2006, p. 6, available at: <http://www.unu.edu/publications/briefs/policy-briefs/2006/PB8-06.pdf>.

alleged CW use to verify the accusation and evaluate the extent to which a stricken party may require assistance.²⁸

The OPCW can recommend punitive measures – as well as bringing parties before the UN Security Council and UN General Assembly – for noncompliance. Sanctions can result from either technical noncompliance (when a state demonstrates a general commitment to the CWC but does not properly implement the treaty) or more likely from substantive noncompliance (when a state engages in deliberate measures to evade the Convention).²⁹ So far State Parties have failed to employ extensive trade sanctions against non-CWC members in an attempt to coerce them into joining the Convention. This is due to several reasons; such as the States Parties considering such economic pressure insufficient and because patron states are often unwilling to pressure their allies or friends into upholding the Convention. Given the ease with which targets have evaded trade restrictions in the past, and the likelihood that any national security obstacles impeding their membership would override economic considerations – the presumption is that they would tolerate economic losses more readily than risk compromising their perceived security imperatives.³⁰

The CWC has several attributes that make it a unique among multilateral WMD arms control agreements. It is the first to prohibit and call for the complete elimination of an entire category weapon. Second, the CWC is seen as “non-discriminatory” in that it formally treats all parties equally, in contrast to the Nuclear Non-Proliferation Treaty (NPT), which establishes the goal of universal nuclear abolition, but allows those states that tested a nuclear weapon before January 1, 1967 to retain their nuclear arsenals for an unspecified time period while denying other countries the legal right to develop the same weapons. The CWC requires all states to renounce chemical weapons, regardless of whether they possessed them at the time the Convention entered into force. Thus the government of Pakistan, whose nuclear arsenal is illegal according to the NPT, has praised the “unique character of the CWC as a disarmament instrument that is based on principles of non-discrimination” and “free from selectivity or double standards.”³¹ Third, the CWC has more extensive verification and enforcement measures than the Biological Weapons Convention, which lacks such measures. The CWC obliges its State Parties to accept extensive monitoring of their public and even their private sector commercial chemical activities. Their chemical facilities are subject to routine as well as challenge inspections. Finally, the creation of the OPCW

²⁸ Jonathan B. Tucker, “Introduction,” in Jonathan B. Tucker (ed.), *The Chemical Weapons Convention: Implementation, Challenges and Solutions*, Washington, Monterey Institute of International Studies, April 2001, pp. 4-5, available at: <http://cns.miis.edu/pubs/reports/pdfs/tuckcwc.pdf>.

²⁹ Amy Sands and Jason Pate, “CWC Compliance Issues,” in Tucker (ed.), *The Chemical Weapons Convention*, *op. cit.*, p. 64.

³⁰ Michael L. Moodie, “Issues for the First CWC Review Conference,” in Tucker, ed., *The Chemical Weapons Convention*, *op. cit.*, p. 64.

³¹ “Pakistan: Statement to the 13th Session of the Conference,” OPCW, 3 December 2008, available at: http://www.opcw.org/index.php?eID=dam_frontend_push&docID=12488269.

has endowed the CWC with unprecedented institutional support. The BWC has no official implementation mechanisms and its Implementation Support Unit, created in 2006, simply assists with various administrative functions and some activities that facilitate the convention's application.

The OPCW has provided State Parties with technical and other assistance to facilitate their participation and compliance. Through workshops, training courses (such as its annual Associate Program), and other means of assistance, OPCW experts have provided invaluable help to national authorities seeking to implement the numerous and complex treaty provisions. The OPCW also offers developing countries detailed technical information about toxic chemicals, including data about possible substitutes.³²

Notwithstanding the CWC's many achievements, and with the approaching elimination of all declared Cold War-era CW stockpiles now in sight, the CWC faces six major challenges:

- 1) incomplete national implementation of the Convention's requirements;
- 2) states of proliferation concern refusing to join the CWC (such as Egypt and North Korea) neither signed nor acceded;
- 3) countries continuing to miss their CW destruction deadlines despite repeated extensions;
- 4) continued and in some cases increased use of CW;
- 5) tensions over chemical technology sharing and export controls, and lastly
- 6) growing resource constraints within the OPCW's due to its expanding missions.

Concerns also exist regarding the effectiveness of the CWC inspection regime, especially its ability to cope with the rapidly transforming global chemical industry due to revolutionary research on neuropeptides, bioregulators, and synthetic biology that enables the large-scale production of potentially harmful toxins.³³ Various scientific and technical advances offer numerous opportunities to reduce the time needed to research, develop, and produce new CW and their means of delivery. Advances in chemical manufacturing processes, equipment, and technologies (e.g., flexible plant designs, modular plant structures, and fully automated systems) are creating more multipurpose chemical plants that can quickly

³² Sergey Batsanov, "Approaching the 10th Anniversary of the Chemical Weapons Convention: A Plan for Future Progress," *The Non – Proliferation Review*, Vol. 13, No. 2, July 2006, p. 341, available at: <http://www.cns.miis.edu/pubs/npr/vol13/132/132batsanov.pdf>.

³³ Katie Smallwood, Ralf Trapp, Robert Matthews, Beat Schmidt, and Leiv K. Sydnes, "Impact of scientific developments on the Chemical Weapons Convention (IUPAC Technical Report)," *Pure Applied Chemistry*, Vol. 85, No. 4, 16 February 2013, p. 853, available at: <http://www.iupac.org/publications/pac/85/4/0851>.

change the chemical products they produce. In principle, a country can rapidly “break out” of its CWC restrictions by swiftly converting to the mass production of banned chemicals.

Furthermore, despite the threat of proliferation among terrorist groups, the CWC still does not explicitly address chemical terrorism.³⁴ Additionally, disputes persist regarding the use of non-lethal chemical agents and incapacitating agents. The OPCW verification regime also has serious weaknesses, such as perennial discrepancies between what countries report as their exports and imports (which should balance), late or incomplete (or not even attempted) reporting declarations, and limited public recognition of the CWC even among chemists.

Moreover, over the past several years there has been a continuing convergence of chemistry and biology. This has allowed scientists to synthesize a growing number of chemical compounds that can have adverse biological effects. In addition, the growing use of biologically mediated processes could facilitate the production of new chemical weapons. At present, some biochemical issues are not fully addressed in either the CWC or the Biological Weapons Convention (BWC), leaving a disturbing gap in international non-proliferation policy. For example, though biologists have their own rules for permissible experiments, they may pay less attention to the chemicals they use, allowing for the possible development of chemical weapons.³⁵ Furthermore, many chemicals that were non-threatening on their own may become dangerous when combined with biotechnology. In order to bridge this gap, the CWC must collaborate with the biological community regarding expectations and jurisdictions. This is why it is so important for the OPCW to maintain an active relationship with practicing chemists at academic institutions and in the professional workforce. These men and women are the most equipped to understand the uses and potential dangers of this research.³⁶

This will require the CWC community to more frequently review the chemical Schedules to determine any new substances that should be added to the list, as well as address any changes that must be made to the current Schedules.³⁷ In addition, OPCW inspectors must be familiar with new technological advances – including those that combine chemistry with other disciplines such as biology, environmental studies, and medicine – in

³⁴ Alexander Kelle, “The Third Review Conference of the Chemical Weapons Convention and beyond: key themes and the prospects of incremental change,” *International Affairs*, Vol. 89, No. 1, 2013, p. 155, available at: http://www.chathamhouse.org/sites/default/files/public/International%20Affairs/2013/89_1/89_1Kelle.pdf.

³⁵ Leiv K. Sydnes, “IUPAC, OPCW, and the Chemical Weapons Convention,” *Chemistry International*, Vol. 35, No. 4, July-August 2013, available at: http://www.iupac.org/publications/ci/2013/3504/1_sydnes.html.

³⁶ “Report of the Advisory Panel on Future Priorities of the Organisation for the Prohibition of Chemical Weapons,” OPCW, 25 July 2011, p. 12, available at: http://www.opcw.org/fileadmin/OPCW/PDF/Advisory_Group_report_s-951-2011_e.pdf.

³⁷ *Ibid.*, p. 13.

order to effectively and successfully evaluate whether a company or government's projects violate the CWC.³⁸ In an attempt to keep up with the scientific community, it has been suggested that the CWC and the OPCW look at open source materials for assistance in identifying and verifying the existence of chemical weapons. In an increasingly technological world – in which inventions such as the internet makes it possible for businesses and organizations to trade, sell, and share information and products – the OPCW should scan the Internet for the most updated information on CW-related developments. Many companies and international organizations publish information regarding the newest trends and innovations in chemical research, and familiarity with this information would allow OPCW inspectors to perform their jobs more effectively.³⁹ The CWC must observe a delicate balance between regulation and scientific progress.

In addition the CWC community must make a greater effort to educate scientists, technical experts, and others about their responsibility to eschew research and related activities that could be used for military purposes. Such outreach should extend to include offering appropriate classes early in chemists' basic education and later role-playing exercises that confront scientists with genuine ethical questions. Proper education and training is essential since chemical scientists are largely a self-regulating community with only a minimal legal framework constraining their behavior. This condition is perhaps inevitable since so much of their work is in new and unexpected areas. Furthermore, the OPCW needs to continue to deepen its ties with the private industry, and make sure that this outreach includes biological as well as the chemical enterprises. They can best relate the probable details of these developments, including how long it will likely take for these revolutionary scientific developments to move from the R&D phase to actual implementation – which will indicate how rapidly the OPCW and national governments have to respond. Safeguards will be needed to ensure that, in achieving the advantages of sharing such information within the scientific community for understanding of discoveries' full implication, sensitive data and property is properly guarded to deny insights to malicious actors like terrorists. Finally, we need to resist the temptation to gut the OPCW budget now that the world is finally realizing its long-sought goal of eliminating the large chemical arsenals that it inherited from the Cold War. Without adequate personnel and the advanced technical capabilities, the OPCW staff will prove unable to monitor and assess, let alone counter, the potentially negative effects of the brave new world of revolutionary scientific developments we are now entering as well as the remaining challenges of the post-Syria era.

³⁸ Ralf Trapp, "Research, Development and Production: Impact and Challenges for Future Verification Under the CWC," in Jean Pascal Zanders (ed.), *The Future of the CWC in the Post-Destruction Phase*, Paris, European Union Institute for Security Studies, No. 15, March 2013, , pp. 16-17.

³⁹ "Report of the Advisory Panel on Future Priorities," OPCW, pp. 12-13.

The Syrian Experience and Lessons

Dealing with the massive chemical weapons arsenal of the Syrian government and the recurring use of chemical weapons during the Syrian civil war has proven an especially difficult challenge for the international community in general and for the OPCW in particular. Some of its influential members have sharply disagreed regarding which Syrian actors might have used chemical weapons and how comprehensively the CWC's provisions apply to non-member countries like Syria before it joined the CWC on October 14, 2013. Since the fighting began in 2011, the Syrian government and the insurgents have accused each other of employing chemical weapons on multiple occasions. The rebels' possession, let alone use, of chemical weapons have never been proven. In contrast, the Syrian government had one of the world's largest remaining chemical weapons arsenals, including a range of chemical agents (from unsophisticated choking agents to advanced nerve agents), several types of delivery systems (such as missiles, bombs, and shells), and many tons of precursors (such as industrial chemicals that can be misused to make chemical weapon agents). This arsenal and the accompanying infrastructures were considered by Syrian leaders as a response to Israel's suspected nuclear weapons. Until recently, the Syrian government had declined to sign the CWC until Israel agreed to eliminate its nuclear weapons, perhaps as part of an agreement to make the Middle East a WMD free zone. Since the civil war began, Syrian government representatives have also occasionally said that their CW represented a deterrent against foreign military intervention in the Syrian civil war, confirming that however dubious the tactical effectiveness of CW against military forces, building or retaining a large CW arsenal can look strategically sound to some countries.

Issues of Strategic Credibility

The Syrian episode underscores the difficulties involved in using coercive diplomacy based on the threat of foreign military intervention against governments employing, let alone simply possessing, chemical weapons. Throughout the Syrian Civil War, U.S. officials warned the Syrian government not to cross a "red line" and use its large CW stockpile. As early as August 2012, President Obama declared, "We have been very clear to the Assad regime, but also to other players on the ground, that a red line for us is we start seeing a whole bunch of CW moving around or

being utilized. That would change my calculus.”⁴⁰ Notwithstanding these threats, on June 13, 2013, the White House alleged that the Syrian government had used CW on “multiple occasions” in 2012, but that these attacks had been “on a small scale” and so the only U.S. response would be to provide the Syrian rebels with some military assistance.⁴¹

Syrian officials may have judged the U.S. threats as lacking credibility for several reasons:

- 1) Syrian use of CW was of limited scale;
- 2) they caused a fraction of the more than 100,000 deaths in the Syrian war;
- 3) they were used during an internal conflict rather than an international war;
- 4) other governments, especially Russia and China, contested the evidence of CW use by the Syrian government;
- 5) above all, U.S. and other Western officials had repeatedly made clear their disinterest in using military force in Syria, which likely emboldened Assad and his foreign supporters.

An earlier credible U.S. threat to intervene militarily in Syria might have changed their calculus, but U.S. vital interests were not at stake in Syria, not even when the mass CW attack at Ghouta, a suburb of Damascus, on August 21, 2013, tipped the scales toward a more plausible U.S. military intervention. The administration said that U.S. intelligence had concluded that the Assad regime had killed more than one thousand people in a single CW attack, though some subsequent commentary has argued that the intelligence was less clear-cut than publicly stated.⁴²

President Obama cited moral and national security considerations as demanding a U.S. response. He termed the incident a massive violation of international law and norms and “the worst chemical weapons attack of the 21st century” that mandated action to punish this “assault on human dignity.” Conversely, leaving the attack unpunished could endanger U.S. national security since the incident “risks making a mockery of the global

⁴⁰ “Remarks by the President to the White House Press Corps,” The White House, 20 August 2012, available at: <http://www.whitehouse.gov/the-press-office/2012/08/20/remarks-president-white-house-press-corps>.

⁴¹ Scott Neuman, “U.S. Says It Has ‘High Confidence’ Syria Used Chemical Weapons,” *NPR*, 13 June 2013, available at: <http://www.npr.org/blogs/thetwo-way/2013/06/13/191395435/report-u-s-europe-conclude-syria-used-chemical-weapons>.

⁴² For example, compare the two following sources: “Government Assessment of the Syrian Government’s Use of Chemical Weapons on August 21, 2013,” The White House, 30 August 2013, available at: <http://www.whitehouse.gov/the-press-office/2013/08/30/government-assessment-syrian-government-s-use-chemical-weapons-august-21>; Seymour M. Hersh, “Whose sarin?,” *London Review of Books*, Vol. 35 No. 24, 19 December 2013, pp. 9-12, available at: <http://www.lrb.co.uk/v35/n24/seymour-m-hersh/whose-sarin>.

prohibition on the use of chemical weapons” as well as endangering “our friends and our partners along Syria’s borders, including Israel, Jordan, Turkey, Lebanon and Iraq” and “could lead to escalating use of chemical weapons, or their proliferation to terrorist groups who would do our people harm,” and so he would take “military action against Syrian regime targets” in response to the outrage.⁴³ But the U.S. threat failed to gain wide international support, even in Europe; on August 30, even the British Parliament unexpectedly voted against UK participation in the planned U.S. military action.⁴⁴ Following the British Parliament’s vote, Obama, despite enumerating all the national interests threatened by Syria’s action, announced his intention to secure congressional approval for a military strike. The President acknowledged congressional approval was not constitutionally required but would make the country “stronger” and the action “more effective” when the United States was bypassing “a United Nations Security Council that, so far, has been completely paralyzed and unwilling to hold Assad accountable.”⁴⁵ Nevertheless, Obama failed to secure strong support, either in Congress or among the American public, for yet another U.S. military operation in the Middle East. International opposition also continued to grow. Even the Obama administration’s statement that any military action would be limited in duration and scale (“unbelievably small” in the words of Secretary of State John Kerry) failed to win over doubters at home or abroad.⁴⁶

Then the Russian government offered Washington a way out by securing Assad’s assent to place Syrian chemical weapons under international control to secure their elimination as demanded by Secretary Kerry in a preplanned statement arranged with the Russians.⁴⁷ Within a day of Kerry’s comments, Walid al-Muallem, the Syrian Foreign Minister, announced that Syria agreed to Moscow’s proposal to remove and destroy Syrian chemical weapons, saying it would “remove the grounds for American aggression.”⁴⁸ In response, Obama announced on September 10 that he would postpone asking for congressional authorizing for an attack to give time for the diplomatic initiative to play out. Although the U.S. climb down risked raising further doubts about the willingness of countries to uphold nonproliferation norms, the Syrian CW elimination deal was rapidly negotiated and implemented. On September 14, Kerry and Russian Foreign Minister Sergey Lavrov negotiated a disarmament deal in Geneva,

⁴³ “Statement by the President on Syria,” The White House, 31 August 2013, available at: <http://www.whitehouse.gov/the-press-office/2013/08/31/statement-president-syria>.

⁴⁴ “Syria crisis: Cameron loses Commons vote on Syria action,” *BBC News*, 30 August 2013, <http://www.bbc.co.uk/news/uk-politics-23892783>.

⁴⁵ “Statement by the President on Syria,” *The White House*, *op. cit.*

⁴⁶ Aaron Blake, “Kerry: Military action in Syria would be ‘unbelievably small,’” *The Washington Post*, 9 September 2013, available at: <http://www.washingtonpost.com/blogs/post-politics/wp/2013/09/09/kerry-military-action-in-syria-would-be-unbelievably-small/>.

⁴⁷ John Kerry, “Remarks With United Kingdom Foreign Secretary Hague,” U.S. Department of State, 9 September 2013, available at: <http://www.state.gov/secretary/remarks/2013/09/213956.htm>.

⁴⁸ “Syria Accepts Russian Chemical Weapons Plan,” *Al Jazeera*, 20 September 2013, available at: <http://www.aljazeera.com/news/middleeast/2013/09/20139109613395758.html>.

the Framework for Elimination of Syrian Chemical Weapons.⁴⁹ On the same day, the Syrian government formally acceded to the CWC, which entered into force in Syria one month later (though Syria had also agreed to abide by its provisions immediately). On September 27, the UN Security Council unanimously adopted Resolution 2118 (2013) demanding the destruction of Syria's chemical weapons by the end of June 2014, though Russian and Chinese opposition deprived the resolution of the threat of punitive military action to enforce compliance.⁵⁰

Issuing these public red lines may be problematic because they reduce the issuer's flexibility in responding to future situations. Furthermore, they place the issuer's credibility at risk if they are not seen as fully carried out. Particularly with the use of chemical weapons in the context of a civil war, such red lines are difficult to enforce when the facts of a case are disputed. For instance, President Assad blamed the opposition forces in Syria for the infamous August 21 chemical attack, and Russian Ambassador to the United Nations, Vitaly Churkin, asserted that the attack was staged in order to pin blame on Assad.⁵¹ Such ambiguity will likely complicate any future foreign military intervention to punish a CW user. In addition, the experiences with Iraq, Libya, and Syria (and, in the nuclear realm, Iran and North Korea) make evident that the UN Security Council will rarely authorize the use of force by one state to destroy the WMDs of another. Any state attacking another that has not attacked it in the first place would place itself in the difficult position of having to cite the defense of multilateral norms to justify unilateral military action. One reason the British and U.S. executive branch leaders decided to seek legislative approval to use force in Syria was to compensate for the lack of this international support, but even if the UK Parliament and the U.S. Congress approved the use of force, other states still might not have supported intervention. Therefore, states seeking to uphold the CWC must consider options other than military intervention, such as tougher sanctions or multilateral disarmament.

Enforcing Coercive Disarmament

In some respects, the Syrian CW elimination effort, with the assistance and the overall supervision of the OPCW-UN Joint Mission in Syria, went surprisingly smoothly. The Syrian government cooperated with the process

⁴⁹ "Framework for Elimination of Syrian Chemical Weapons," *U.S. Department of State*, 14 September 2013, available at: <http://www.state.gov/r/pa/prs/ps/2013/09/214247.htm>.

⁵⁰ "UN Security Council seeks end of Syria's chemical arms," *Business Standard*, 28 September 2013, available at: http://www.business-standard.com/article/international/un-security-council-seeks-end-of-syria-s-chemical-arms-113092800703_1.html.

⁵¹ "Moscow Revives Debate on Who Carried Out Syrian Nerve-Gas Strike," *Global Security Newswire*, 17 December 2013, available at: <http://www.nti.org/gsn/article/moscow-revives-debate-who-carried-out-syrian-nerve-gas-strike/?mgs1=26dde85eLG>.

and has fulfilled many of its obligations.⁵² Syria's CW existed mostly as precursor materials, was in a liquid form, and was stored in either drums or bulk containers. The Syrian government transported these chemicals from storage sites located throughout the country to the port city of Latakia. From there, the five "priority chemicals" were loaded on to a Danish cargo ship and the less hazardous "industrial grade" chemicals were loaded onto a Norwegian vessel, which both waited in international waters for each additional shipment, before transporting the chemicals from Latakia to the Italian port of Gioia Tauro.⁵³ Once at Gioia Tauro, approximately 560 tons of material, including sulphur mustard (which creates mustard gas) and DF (the precursor to sarin) were transferred on to the *MV Cape Ray*, a U.S. ship that did not dock in Syria to avoid the risk of presenting a tempting target to troublemakers.⁵⁴ The United States equipped the *MV Cape Ray*, a 35,000-ton roll-on, roll-off civilian transport ship, with specialized equipment, containers, crew, and other features to break down Syria's priority one CW into less dangerous toxic substances in international waters. The two units of the newly developed Field Deployable Hydrolysis System (which neutralizes the CW agents by diluting them with other chemicals and hot water rather than incineration) installed on board the ship neutralized the majority of the "priority" toxic substances. Russia, China, EU members, and other member countries contributed money, people, ships, vehicles, and technologies to this international effort, underpinned by special OPCW trust funds.

On August 28, OPCW Director-General, Ambassador Ahmet Üzümcü, reported to the OPCW Executive Council that all of Syria's declared Category 1 chemicals, some 1040 tons of the most dangerous agents that are normally used as weapons, had been verifiably destroyed on-site in Syria or on the *Cape Ray*. He also noted that four facilities in Finland, Germany, the United Kingdom, and the United States were eliminating the remaining dangerous chemicals.⁵⁵ The mission, however, had to overcome many dangers and difficulties. Disposing of CW is a dangerous and complicated process that must be undertaken carefully by trained personnel in specialized facilities, which Syria lacked. The international community had to engage in "the procurement and delivery of large quantities of packaging and transportation materials and equipment," but delays resulted from bad weather, lengthy clearances, and other impediments.⁵⁶ Western governments refused to provide some equipment

⁵² "United States Offers to Destroy Syria's Priority Chemicals," OPCW, 30 November 2013, available at: <http://www.opcw.org/news/article/united-states-offers-to-destroy-syrias-priority-chemicals/>.

⁵³ "Trans-loading of Syrian Chemicals to be Undertaken at Port of Gioia Tauro in Italy," OPCW, 16 January 2014, available at: <http://www.opcw.org/news/article/trans-loading-of-syrian-chemicals-to-be-undertaken-at-port-of-gioia-tuaro-in-italy/>.

⁵⁴ Christine Jeaveans, "Destroying Syria's chemical weapons," *BBC News*, 2 July 2014, available at: <http://www.bbc.com/news/world-middle-east-25810934>.

⁵⁵ "OPCW: All Category 1 Chemicals Declared by Syria Now Destroyed," OPCW, 28 August 2014, available at: <http://www.opcw.org/news/article/executive-council-discusses-findings-of-fact-finding-mission/>.

⁵⁶ "Director-General: Removal of Priority Chemicals in Syria Marks 'Important New Phase' in Work of Joint Mission," OPCW, 8 January 2014, available at:

that the Syrian government requested to assist with its CW destruction program that could have also reinforced the regime's capacity against the rebels.⁵⁷ The division of authority between the OPCW, the UN Security Council, and the other parties involved in the demilitarization effort remained unhelpfully unclear. The OPCW could not talk directly with the rebels and so had to work through the UN. Adding even more friction to the whole process, the agreed-upon schedule for disposing of Syria's CW accelerated what should have taken years of work into several months.⁵⁸

Verification is also imperfect since there is no completely reliable way to prove Syrian government claims that they destroyed some of their CW stocks in the last few years since they were getting old or had become vulnerable to opposition seizure. U.S. officials correctly queried the accuracy of the Syrian declarations – the Syrian government has repeatedly had to amend its initial declaration to the OPCW to add additional CW production facilities and has also transferred more Sarin to the OPCW, though denying ownership of this dangerous CW agent.⁵⁹ The recent use of chlorine gas is particularly troubling for the task of verifying the removal of chemical agents, as chlorine, which has many commercial uses, was not included in the list of weapons the regime agreed to place under international control.⁶⁰ Finally, we may never have solid answers to some questions, such as the precise origins of the Syrian CW and which Syrians used them on which occasions (the UN inspection team found at least five likely instances).⁶¹ The Russians in particular seem eager to obfuscate both issues, and they and the Chinese have ensured that the United Nations Security Council (UNSC) enforcement resolutions regarding Syria's WMDs, unlike those of Iraq's two decades ago, lacked a collective threat of military action to eliminate Syria's CW in case of noncompliance.

<http://www.opcw.org/news/article/director-general-removal-of-priority-chemicals-in-syria-marks-important-new-phase-in-work-of/>.

⁵⁷ Colum Lynch, "Are World Powers Jeopardizing the Safety of Syria's Chemicals?" *ForeignPolicy.com: The Cable*, 11 December 2013, available at: http://thecable.foreignpolicy.com/posts/2013/12/11/are_world_powers jeopardizing_the_safety_of_syrias_chemicals.

⁵⁸ Michael R. Gordon, "U.S. and Russia Reach Deal to Destroy Syria's Chemical Arms," *The New York Times*, 14 September 2013, available at: <http://www.nytimes.com/2013/09/15/world/middleeast/syria-talks.html>.

⁵⁹ J P Zanders, "Gradually making sense of Syria's CW declarations," *The Trench*, 11 August 2014, available at: <http://www.the-trench.org/syrias-cw-declarations/>; UN Secretary-General's monthly progress report, 25 July 2014, available at: http://www.un.org/en/ga/search/view_doc.asp?symbol=S/2014/533; Lorenzo Ferrigno, Ann Roche and Richard Roth, "Diplomat: Syria has four chemical weapons facilities it didn't disclose," *CNN*, 7 October 2014, available at: http://www.cnn.com/2014/10/07/world/meast/syria-chemical-weapons/index.html?hpt=hp_t1.

⁶⁰ Christoph Reuter, "Assad's New Bomb: Syrian Regime Hasn't Abandoned Chemical Weapons," *Der Spiegel Online*, 8 May 2014, available at: <http://www.spiegel.de/international/world/evidence-mounts-of-chlorine-gas-attacks-in-syria-a-968108.html>.

⁶¹ "United Nations Mission to Investigate Allegations of the Use of Chemical Weapons in the Syrian Arab Republic: Final Report," U.N. Office for Disarmament Affairs, December 2013, available at: <https://unoda-web.s3.amazonaws.com/wp-content/uploads/2013/12/report.pdf>.

Although UN Secretary-General Ban Ki-moon has laid responsibility on the Security Council to hold those accountable for the August 21, massacre in particular, that will remain impossible as long as the key members continue to disagree fundamentally over who is responsible.⁶²

Finally, this case of coercive disarmament happened in a very specific political and strategic context, and conditions that made it possible may not be reproducible in future cases where the international community has to deal with CW-armed states. The way the West, and the US in particular, has somewhat errantly wielded coercive threats does not bode well for the future. Issuing public red lines is a delicate act and the effectiveness of such a policy depends on how precisely the red line is crafted and defined. While constructing red lines, issuers need to consider the tradeoff between constructive ambiguity and vulnerable clarity, and to make sure that outlining precise conditions will not decrease the issuer's flexibility to respond. These red lines can also place the issuer's credibility at risk in the longer term when they are not seen as fully carried out – a perception which may emerge if they are crafted without strategic consistency, or with an incorrect sense of one's own freedom of action on the domestic or international scenes. In the case of CW use, such red lines become even more blurred and problematic because it is difficult to determine if a chemical weapon was used intentionally or accidentally, for what purpose and by whom. The issue of declaring red lines for CW use will likely complicate any future foreign military intervention to punish a CW user. In addition, the experiences with Iraq, Libya, and Syria make evident that the UN Security Council will rarely authorize the use of force by one state to destroy the WMDs of another. Any state attacking another that has not attacked it in the first place would place itself in the difficult position of having to cite the defense of multilateral norms to justify unilateral military action. Indeed, one reason the British and U.S. executive branch leaders decided to seek legislative approval to use force in Syria was to compensate for the lack of international support. It appears likely that great power politics, domestic constraints and the inherent difficulty in issuing credible threats of military interventions will hamper future efforts to curb the remaining CW programs.

⁶² Cara Anna, "Russia: Aug. 21 Syria chemical attack was 'staged'," *Associated Press*, 16 December 2013, available at: <http://news.yahoo.com/russia-aug-21-syria-chemical-attack-39-staged-205050968.html>.

Conclusion and Future Considerations

Despite all the problems the international community has faced in Syria, it is hardly the most challenging case imaginable of CW-armed adversary. A future scenario may unfold very differently with a government or military being hostile to the destruction of its CW stockpile. Even after Iraq declared its CW program, its government continued to engage in a confrontational stance with the UN Special Commission over the destruction and removal of its CW program. Due to international pressure the international community wore down the stance of the Iraqi government causing a steady changing attitude toward the dismantlement of its CW program.⁶³ It is possible that both Iraqi leader Saddam Hussein and Libyan strongman Muammar Gaddafi may not have declared all their WMDs to the international community.⁶⁴ Given the imperfect verification nature of the CWC, residual CW stocks and production equipment could still be concealed. As CW programs are dismantled, scientists and technicians from these countries could be hired, duped, or coerced into misusing their expertise in chemistry for a terrorist organization. The danger of allowing dual-use chemicals, such as chlorine, to evade removal is also evident in the recent gas attacks on Syrian civilians.

Local opposition has prevented the transferring of CW agents and their precursors directly to foreign countries for elimination, yet world public opinion in the Syria case generally accepted the plan to eliminate the most dangerous agents at sea despite possible ecological risks should an accident and substantial spillage occur. Such a benign condition may not always hold true. There is little solid evidence that the Syrian rebels have ever possessed, let alone used, a sophisticated chemical weapon like sarin. Despite the differences in the Syria case, Moscow and Washington both had incentives to ensure the safe and secure elimination of the Syrian CW stockpile and both pressed the Assad regime to uphold its CWC commitments. They also had a lot of intelligence verifying whether Syria was fulfilling its demilitarization commitments. However, Putin did not pressure Damascus to eliminate its CW just to uphold the CWC, but rather to decrease the risk of a Western military operation that would have

⁶³ "BBC interview with Green Cross's Paul Walker on Syria chemical weapons," Green Cross, 4 December 2013, available at: <http://www.youtube.com/watch?v=VUE8ODPssRg>.

⁶⁴ Zachary Kallenborn and Raymond A. Zilinskis, "Disarming Syria of Its Chemical Weapons: Lessons Learned from Iraq and Libya," Nuclear Threat Initiative, 31 October 2013, available at: <http://www.nti.org/analysis/articles/disarming-syria-its-chemical-weapons-lessons-learned-iraq-and-libya/>

changed the balance of power on the ground in Syria. Once the option for a U.S.-led air campaign against Syrian CW targets was removed, Russia's role in Syria became more ambivalent and instrumental. In other cases Moscow might offer a stronger defense of its CW-armed clients.

Fears of CW use by a government against its own people, or terrorist acquisition of CW, also arose during Libya's recent civil war. The post-Qaddafi government in Libya revealed in 2011 that the regime had large stockpiles of mustard gas as well as undeclared stockpiles of more sophisticated chemical weapons.⁶⁵ The security vacuum in both Libya and in Syria today could allow non-state actors such as terrorists and crime syndicates to gain access to some of the world's most dangerous chemical agents, or the necessary scientists, materials and technology needed for their development. Even with the elimination of the Syrian, Libyan, and eventually Russian and U.S. CW arsenals during the next decade (the current target dates are December 2015 for Russia, December 2016 for Libya, and September 2023 for the United States), the threat posed by CW will continue to persist, emanating from the stockpiles of the remaining non-CWC members.⁶⁶ Although Director-General Üzümcü said in his December 2013 Nobel Prize acceptance speech that Angola, Myanmar, and South Sudan "[were] very close" to joining the CWC, North Korea and Egypt remain the most serious objects of concern.⁶⁷ Past efforts to address Syria's CW were primarily multilaterally focused on Egypt and Israel as well, since the two Arab governments conditioned their joining the CWC on Israel's joining the NPT. Despite the formal OPCW position opposing linking CW disarmament to other nonproliferation issues, for the past few years the OPCW had been collaborating with other bodies to convene the conference on making the Middle East a WMD-free zone. Given the importance of mutual deterrence in shaping the decisions of states that still pursue or keep CW, efforts to eliminate chemical weapons should be linked to other WMD nonproliferation enterprises and to considerations related to regional military balances.

The CWC needs to evolve from an institution primarily concerned with disarming states' CW stockpiles to one that can respond adequately to threats of CW proliferation and use by national governments, the latent reconstitution capacity in the former CW possessor states, and also by ISIS-like extremist groups seeing CW as valuable weapons of terror, which could be the greatest challenge. Whereas in the past, OPCW defense capacity building focused on protecting first armed forces from mass state attacks, future training and related activities will need to concentrate more on bolstering the defense capabilities of first responders given the

⁶⁵ Alan Boyle, "Toxic Task: How to Destroy Syria's Chemical Weapons," *NBC News*, 11 September 2013, available at: <http://www.nbcnews.com/science/toxic-task-how-destroy-syrias-chemical-weapons-8C11133187>

⁶⁶ OPCW Executive Council, "Report of The Executive Council On The Performance Of Its Activities In The Period From 16 July 2012 To 19 July 2013," Seventy-Fourth Session, EC-74/4, C-18/2, 9 October 2013, p. 5.

⁶⁷ Ahmet Üzümcü, "Working Together for a World Free of Chemical Weapons, and Beyond," OPCW, 10 December 2013, available at: https://www.opcw.org/index.php?eID=dam_frontend_push&docID=16943

increased threat of terrorist attacks using dangerous chemicals. The agency needs to receive a budget sufficient to maintain modern equipment, skilled staff, and other readily applicable capabilities. The OPCW's Nobel Prize could provide a welcome means of helping the OPCW, under the recently renewed leadership of Director-General Ahmet Üzümcü, to overcome some of its weaknesses.⁶⁸ For example, the international community could exploit the favorable publicity to convene a counter-chemical weapons donors' conference to generate funds for the Syrian elimination mission but also for the OPCW. The delays that have occurred transporting procured equipment to Syria resulting from lengthy international customs clearance procedures highlights the need to establish some accelerated or pre-clearance procedures in advance.⁶⁹

The Syrian and Libyan cases also make evident that CWC members, including the United States, could profitably devote more resources to enhancing their ability to assist a country that is attacked with chemical weapons. In many cases, the equipment that the State Parties have pledged to offer a country suffering a chemical attack is reaching the end of its anticipated operational life and needs to be replaced. In addition, a number of States Parties have yet to indicate what, if any, assistance they might provide to a country experiencing a CW attack, or even to fulfill their CWC obligation to provide annual information on their national chemical defense programs. Many states that have pledged to render assistance to a country suffering from a chemical incident lack the means to transport their aid packages to distant locations. It also remains unclear whether some of their pledged assistance has concurrently been offered to other organizations, such as regional security bodies like NATO and the African Union, which might also respond to a CW emergency. In such cases of concurrency, the provider would have to divide or share its emergency aid among these institutions, ruining their planning. The OPCW does have its own stockpile of protective equipment, but a major chemical incident would require considerably more assistance.

Another way the international community can assist the OPCW is to develop more complementary and supplementary tools. For example, on April 28, 2004, the UN Security Council, especially alarmed by recent revelations about the covert A.Q. Khan WMD proliferation network, unanimously adopted a joint Russian-American draft resolution (UNSCR 1540) that strengthens international requirements against WMD proliferation by non-state actors by requiring national governments to prevent them from developing, acquiring, manufacturing, possessing, transporting, transferring or using chemical, biological or nuclear weapons and their delivery systems.⁷⁰ Specifically, the resolution enjoined national

⁶⁸ "Ahmet Üzümcü re-appointed as OPCW Director-General," OPCW, 4 December 2013, available at: <http://www.opcw.org/news/article/ahmet-uezuemcue-re-appointed-as-opcw-director-general/>.

⁶⁹ "Statement By The Director-General To The Executive Council At Its Thirty-Sixth Meeting," OPCW, 17 December 2013, available at: https://www.opcw.org/fileadmin/OPCW/EC/M-36/ecm36dg05_e.pdf

⁷⁰ Homepage of the United Nations Security Council Resolution 1540 (2004), <http://www.un.org/en/sc/1540/>

governments to adopt legislation to prevent proliferation of chemical, biological and nuclear weapons and their means of delivery, and also to establish domestic controls over related materials. It also obliges states to refrain from supporting illicit use of such materials by non-state actors. The resolution encourages international cooperation to achieve the objectives.⁷¹ Since it was adopted under Chapter VII of the UN Charter, UNSCR 1540, which the Security Council has since renewed and strengthened, is binding on all states regardless of whether they are formal parties to the various international nonproliferation organizations, regimes, and agreements.⁷²

UNSCR 1540 established a 1540 Committee to monitor implementation of these provisions. Since its enactment, more countries have enacted WMD-related legislation to counter WMD terrorism and shared with the international community information about these measures.⁷³ According to the letter from the chair of the 1540 committee to the Security Council, dated 2011, 140 states had adopted legislative measures to prohibit the proliferation of chemical, biological and nuclear weapons, compared to 65 states in 2006.⁷⁴ In 2011 135 states had adopted national legislation to prohibit the manufacture or production of CW by non-state actors, compared to 105 states in 2008, but the degree and effectiveness of these measures have been unclear.⁷⁵ One problem with the original resolution was that it was essentially an unfunded mandate imposed on countries by the Council, which established mandatory requirements for all countries regardless of their varying national capacity to meet them. To address this issue, various arms control NGOs have joined with the 1540 Committee and other international institutions to provide financial and technical assistance to countries to help them meet their 1540 obligations and support related efforts against nuclear terrorism.⁷⁶

UNSCR 1540 reinforces the CWC since Article 7 of the resolution requires provisions of the CWC to be translated into national law.⁷⁷

⁷¹ The origins of the resolution are discussed in Olivia Bosch and Peter van Ham (eds.), *Global Non-proliferation and Counter-terrorism: The Impact of UNSCR 1540*, Washington, Brookings Institution, 2007.

⁷² Resolution 1540 S/RES/1540 (2004).

⁷³ Comprehensive Review on the Status of Implementation of Resolution 1540 (2004).

⁷⁴ S/2011/579, Report of the Committee established pursuant to Security Council resolution 1540 (2004), 12 September 2011, p. 2, available at: http://www.un.org/en/ga/search/view_doc.asp?symbol=S/2011/579

⁷⁵ The Center for International Trade and Security at the University of Georgia has several publications and programs assessing the various challenges in implementing UNSCR 1540, as well as possible means to overcome them; these are available at: http://cits.uga.edu/about_cits.

⁷⁶ Many of these NGO initiatives are discussed at "UNSCR 1540," Muscatine, Iowa, The Stanley Foundation, available at: <http://www.stanleyfoundation.org/programs.cfm?id=29>.

⁷⁷ Steven Westervelt, "Implementation of UNSC Resolution 1540 at the national level: promotion of best practices and policy and technical co-ordination and co-operation," Netherlands Institute of International Relations, 26-27 March 2009, p. 5, available at: http://www.stanleyfoundation.org/resources/1540_2009_un_event/Netherlands_1540_Report_2009.pdf.

Additional tools could include better CW agent destruction technologies and better tactical options and techniques to eliminate CW stockpiles.⁷⁸ In addition, we need to encourage earlier responses to allegations of deadly chemical agents, tougher economic sanctions against violators, and stronger multilateral efforts among the states with the greatest capabilities to deter and remove chemical materials. As Samantha Power, U.S. Ambassador to the United Nations, asserted regarding the crisis in Syria, "...to those who would argue that a Head of State or government has to choose only between doing nothing and sending in the military – I maintain that is a constructed and false choice, an accompaniment only to disengagement and passivity."⁷⁹ The lack of such alternatives often leaves states with few options other than rely on the overburdened OPCW or make threats of military intervention to disarm unsavory regimes. As the Syrian case has shown, such threats often lack credibility given their ineffectiveness, impreciseness, questionable legal status, and other flaws. An important task is to strengthen other tools for averting CW proliferation, deterring CW use, and defeating any CW attacks.

⁷⁸ Timothy M. Bonds, Eric V. Larson, Derek Eaton, Richard E. Darilek, *Strategy-Policy Mismatch: How the U.S. Army Can Help Close Gaps in Countering Weapons of Mass Destruction*, Santa Monica, RAND Corporation, 2014, available at: http://www.rand.org/pubs/research_reports/RR541.html.

⁷⁹ Samantha Power, "Remarks by Ambassador Samantha Power, U.S. Permanent Representative to the United Nations, at the U.S. Holocaust Memorial Museum's National Tribute Dinner," United States Mission to the United Nations, 30 April 2014, available at: <http://usun.state.gov/briefing/statements/225491.htm>.

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