Special Report: Impact of Syrian conflict on chemical weapons usage and proliferation

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Executive Summary

From its outset, the Syrian conflict has exacerbated concerns in the Middle East and around the world of chemical weapons proliferation and usage. Chief among these concerns is the possibility that the Assad regime's large chemical stockpile would be deployed against the Syrian population or neighboring countries, or, that portions of the stockpile would be captured by Syrian rebels and proliferated among extremist groups. Such concerns have partially materialized in the form of chemical attacks by the Assad regime, drawing increased international efforts to disarm Syria of its chemical weapons.

This report will examine the current state of Syria's chemical weapons arsenal and the threat of chemical attacks in the Middle East region. The conclusions of this examination are as follows:

- Despite the delayed progression of the Organization for the Prohibition of Chemical Weapons (OPCW) disarmament process, the Assad regime will maintain a small portion of its stockpile for tactical usage and for deterrence against a potential rebel offensive in major cities and in the Alawite coastal areas.
- The severe reduction of the Assad regime's chemical weapons manufacturing capability and stockpile has considerably reduced the potential for a major chemical attack against neighboring countries. Threats remain higher in shared border areas of Jordan, Lebanon, and Turkey.
- Due to the regime's chemical weapons usage, extremist groups in the region have increased their efforts to acquire and/or produce chemical weapons for use against the Assad regime and major cities in neighboring countries.
- The threat of a chemical attack in a major city in the region still remains low, with Syria and Iraq remaining the most at risk.

This report covers only threats posed by chemical weapons, and does not cover threats posed by biological or nuclear/radiological weapons in the region.

Current Situation: Syrian chemical weapons disarmament

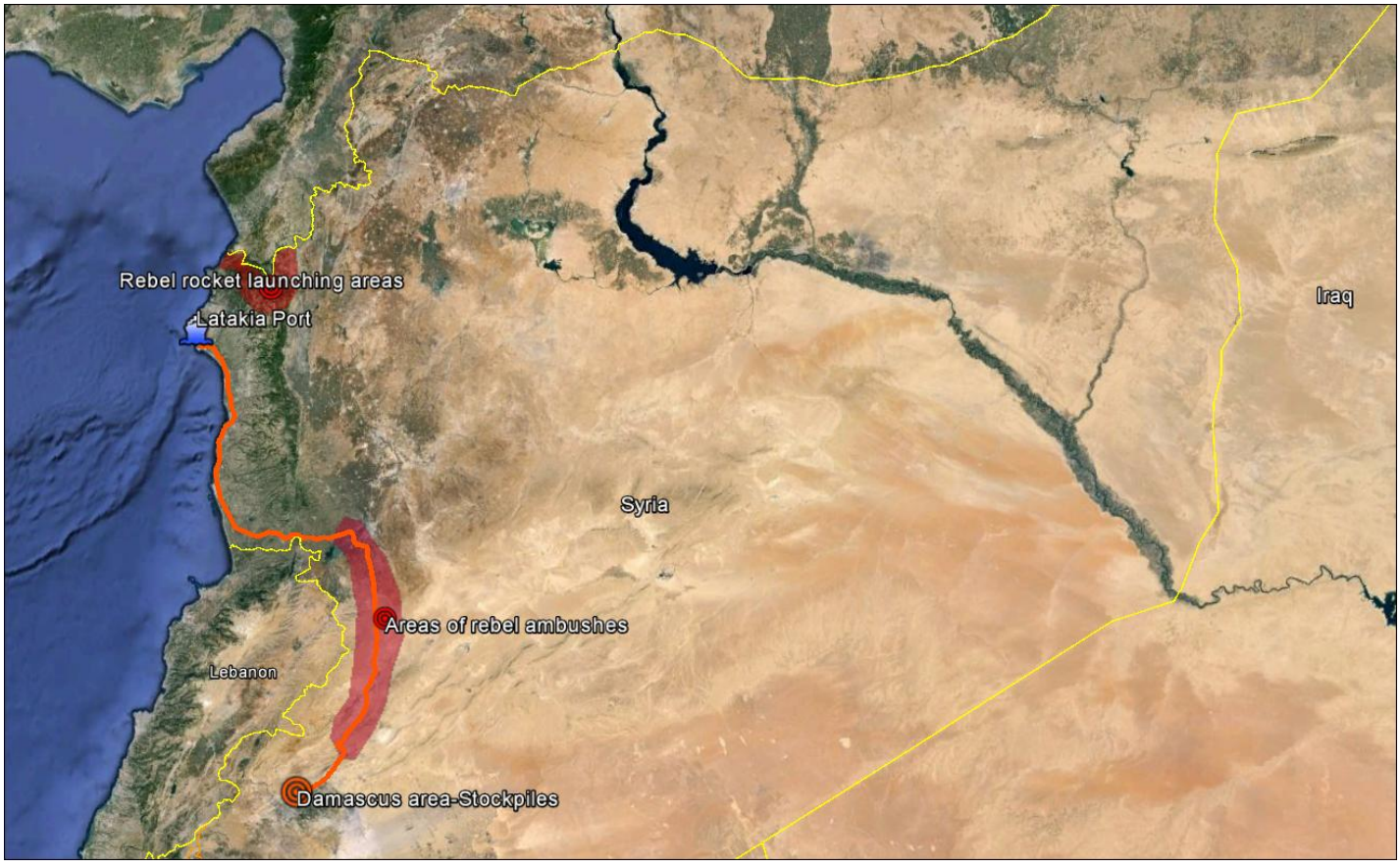
On March 20, the Organization for the Prohibition of Chemical Weapons (OPCW) stated that 11 consignments of the Assad regime's chemical weapons stockpile had been removed from Syria, aboard foreign vessels leaving the port of Latakia. According to the OPCW, 53.6 percent of the regime's chemical weapons stockpile have been removed from the country, including 34.8 percent of all "priority 1" agents, and 82.6 percent of all "priority 2" chemicals in the Assad regime's reported inventory. Priority 1 chemicals generally consist of ready-to-use agents while priority 2 chemicals consist of less-hazardous industrial materials which are mixed together in order to become weaponized. Included in the 11 consignments of removed chemicals is the regime's entire stockpile of Sulphur mustard gas, a chemical agent which is produced and stored in a ready-for-use manner. On April 4, the 12th installment of chemical weapons materials departed from Syria, prompting OPCW officials to urge Syria to expedite the transfer and removal process after a two-week delay between shipments.

- The OPCW has additionally reiterated its goal to remove all priority 1 and 2 chemical agents from Syria by June 30, 2014, completing an agreement organized by Russia and the United States to completely disarm the Assad regime of its chemical weapons capability.
- The Assad regime has since failed to meet two prior deadlines in the agreement, including its commitment to remove all priority 1 agents by December 21, 2013. The Assad regime had also missed a revised March 14 deadline for the removal of those chemicals, setting a new deadline on April 27.
- After missing those deadlines, particularly that of March 14, the United States criticized the Assad regime as responsible, refuting regime claims that rebel attacks were preventing shipments from reaching Latakia port. The United States has not, however, officially accused the Assad regime of violating the September 14 Framework for the Elimination of Syrian Chemical Weapons, the official name of the disarmament plan.
- The Syrian opposition has accused the Assad regime of renewed chemical attacks in the Damascus area on at least two recent occasions, including on March 28 in the Harasta area and on April 3 in the Jobar area. On April 11, an alleged gas attack in the Hama Province village of Kafr Zita wounded over 100 and killed two, with the Syrian government accusing the Jihadist Jabhat al-Nusra of carrying out the attack, and opposition sources claiming that regime helicopters dropped the gas from explosive canisters.
- The OPCW has since stated that it would require permission from one of its mandate signatories to investigate recent allegations of chemical attacks. On April 10, the U.S. government stated that it was investigating claims of new chemical attacks, while the Turkish government claimed that four such attacks have been carried out since the OPCW disarmament mission went into effect.

Current Situation: Incidents of chemical weapons proliferation

Since 2012, speculation and accusations have arisen that radical elements such as Hezbollah and al-Qaeda linked groups have acquired or seek to acquire chemical weapons.

- In May 2013, Turkish security forces claimed to have uncovered a 2kg cylinder containing sarin gas during a raid against a suspected Jabhat al-Nusra hideout in a town in the southern Adana Province. 12 militants were arrested in the operation and charged with plotting to carry out an attack in the city of Adana.
- In September 2013, several regional media outlets reported that a number of vehicles carrying chemical materials had entered into Lebanon and Iraq from Syria to be transferred to elements loyal to the Assad regime, including Hezbollah. The Syrian opposition, including the head of the Free Syrian Army Salim Idriss further stated on September 12, 2013 that the Assad regime had begun to move chemical materials to neighboring countries, although those reports and accusations have not been verified by any official source in the region or in the West.
- Furthermore, reports indicate that all six convoys carrying chemical agents from the Damascus area to the Latakia port have come under attack by Syrian rebels, mainly in the Qalamoun and Homs areas. Rocket attacks have also occurred in the vicinity of the Latakia port during loading operations. That said there have been no rebel attacks which resulted in damage to or theft of containers carrying chemical agents.
- On March 20, the OPCW announced that that Assad regime had ordered transfers of chemical agents to be stopped due to deteriorating security conditions in Latakia Province, Prompting the delay between the March 20 and April 4 shipments.



Map depicts transfer route for chemical weapons to Latakia port.

Background: Chemical weapons capability of the Assad regime

Syria's chemical weapons program was established in 1971, sponsored by Egypt and Russia, the former having already established its own program for use in the Yemeni civil war and as a deterrent against Israel. Egypt played a major role in advising and establishing Syria's program until the mid-1980s when the Assad regime achieved full self-sufficiency in the production of chemical agents and arms.

According to OPCW findings in October 2013, Syria possessed 1,300 tons of chemical agents in their various forms, although assorted reports indicate that the Assad regime may have stockpiled upwards of 1,500 tons of chemical substances, including mixing precursors. By September 2013, these agents were being produced, mixed, or stored at approximately 40-43 sites.

Chemical agents included in Syria's arsenal until September 2013:

Agent	Type	Quantity
Mustard	Blister	500-700 tons
Tabun	Nerve	Limited
Sarin/variants of Sarin	Nerve	700 tons
VX	Nerve	20-100 tons

By September 2013, the Assad regime possessed the following delivery methods for these agents.

Method	Types	Agents	Quantity
Artillery	Short-medium range Grad Rockets Heavy Mortars Domestically-produced "Volcano" Rockets	Sarin, Sarin variants Mustard VX	+100,000 (conventional)
Aerial	Iron Bombs with chemical tipped warheads	Sarin, Sarin variants Mustard	+3,000
Ballistic Missiles	Scud-B, Scud D Long Range Missiles	Sarin, Sarin variants Mustard	100 chemical warheads

Background: Syrian chemical weapons disarmament plan

Increase in chemical weapons attacks attributed to the Assad Regime

On August 21, 2013, a major attack using a variant of Sarin nerve agent occurred in the Eastern Ghouta region of Damascus, a rebel-held area. The Assad regime was blamed for the attack, which was reportedly carried out by an elite loyalist unit which fired the chemicals from over four domestically-produced rockets from a regime-held area in the capital, killing between 1,400 to 2,000 people, including hundreds of civilians. That attack was preceded by a series of smaller incidents involving variants of blister and nerve agents dating back to March 2013, when the Assad regime was first accused of firing chemically-tipped rockets in the Aleppo area, which accidentally hit the pro-regime district of Khan al-Assal.

Domestically-produced "Volcano Rockets" were suspected of being used by the regime to deploy chemical weapons on August 21.

Due to their unprecedented scope, the August 21 chemical attacks in Eastern Ghouta drew international condemnation, including a campaign to organize support for military intervention led by the U.S., U.K., and France.

Threats of military intervention

By August 29, 2013, the United States, France, and the U.K. had deployed significant naval and air forces in areas bordering Syria, with officials indicating that a limited military intervention consisting of pin-point attacks against Assad regime targets was imminent. On August 30, however, the U.K. parliament voted to reject British involvement in military intervention followed by an August 31 statement by President Obama that a strike on Syria would require congressional approval.

Emergence of political solution

On September 9, U.S. Secretary of State Kerry rhetorically offered the Assad regime to relinquish its chemical arsenal as the only option to stave off military intervention. The Russian government, a primary backer of the Assad regime, then responded by announcing it would pressure the regime to disarm as part of a diplomatic solution. Talks between Russian and U.S. officials took place in Geneva from September 12-14, resulting in the creation of the Framework for the Elimination of Syrian Chemical Weapons, which was to be carried out by the OPCW, the United Nation's chemical weapons disarmament body.

The chemical disarmament plan

The Russian-U.S. framework agreement was made official through a U.N. Security Council resolution on September 28, 2013. The resolution binds Syria to both abandon its chemical weapons stockpile and to allow full access to OPCW inspectors. As part of the resolution, failure by the Assad regime to comply would force a referral of Chapter VII of the U.N. Charter, which

would call for debate on a new resolution to implement economic sanctions and military force as a means to confront threats to international peace and security. The disarmament plan presented the following timeline:

- Disclosure of full chemical weapons inventory by September 20, including production sites and stockpiles.
- Completion of on-site inspections by OPCW teams "by November."
- Destruction of production, mixing, and filling sites "by November."
- Complete elimination of all chemical agents, materials, and equipment in Syria by the "first half of 2014."

Assessments: Impact of disarmament process on Assad regime's chemical weapons program

Assad regime's chemical weapons program severely diminished by disarmament process; though portions preserved

- The OPCW's disarmament process has left the Assad regime with approximately 20 percent of its chemical arsenal, with a severely limited ability to replenish its ready-for-use sarin and mustard gas stockpiles due to the destruction of almost all production and mixing facilities. There are two sites remaining that are deemed unreachable due to ongoing hostilities between regime and rebel forces. In addition, a total of 12convoys carrying chemical agents have successfully reached the port city of Latakia for transfer outside of the country by European vessels. These convoys have transferred the entirety of the Assad regime's mustard gas stockpile (30 tons of ready-to-use material) for destruction outside of the country, in addition to several other shipments of priority 1 and priority 2 agents and precursor mixing chemicals for sarin. It is therefore assessed that 600 tons of chemical agents, mainly priority 2 mixing precursors for sarin, remain in the country.
- That said we assess that it remains highly likely that the Assad regime has preserved small portions of its chemical arsenal, including Sarin or Sarin-variants for use in future hostilities. Despite the known political risks of carrying out additional chemical attacks, hard-line Alawite elements of the Assad regime remain convinced that retaining such capabilities are key to deterring a future rebel advance on regime strongholds along the coast and within Damascus, as well as deterring tactical rebel advances on other major cities. In this context, it should be noted that a rebel advance in the Kessab region of Latakia has coincided with the Assad regime's decision to halt chemical weapons transfers, even though the hostilities did not directly threaten transport routes.
- In this context, the Assad regime is liable to continue deploying chemical agents in an isolated, tactical fashion against rebel positions in Damascus and other major cities. Prior to the August 21 sarin attack in Eastern Ghouta, the regime had, on several occasions, used chemical variants which were less lethal, but nonetheless succeeded in instilling widespread panic amongst civilian populations hosting rebel forces. The limited lethality and scope of each of these attacks ensured difficulty for the Syrian opposition in garnering international attention or ability to place blame on the Assad regime. To this regard, the alleged attacks in eastern Damascus areas of Harasta and Jobar on March 27 and April 3, respectively, are indicative of a possible resumption of this escalatory usage.

Pressure from key Assad regime allies to remain crucial for completion of chemical weapons disarmament

- In September 2013, threats of imminent military intervention combined with immense pressure from Russia were believed to have forced the Assad regime to agree to dismantle its chemical weapons program. Despite missing several key deadlines, the Assad regime's

general adherence to the agreement has reduced the prospects of military intervention, as highlighted by the Obama administration's refraining from branding those missed deadlines as "non-compliance," which according to UN resolution 2118, would activate Chapter VII of the UN charter.

- We assess that the Assad regime has an interest in both preserving limited portions of its chemical weapons arsenal, while prolonging the disarmament process as long as possible, albeit without going so far as to draw accusations of violating UN resolution 2118. By prolonging the process, the Assad regime is able to keep international focus on the chemical weapons issue, staving off the anticipated criticism of ongoing unlawful conventional combat tactics once the disarmament process is completed. Furthermore, prolonging the process enables the Assad regime to maintain leverage against Western backers of the Syrian opposition, forcing those entities to continue dealing with the regime as a legitimate negotiating partner.
- In recent months, the Assad regime has blamed delays on transfers to rebel attacks along the transport route from Damascus to Latakia, most recently when convoys were ordered to stop on March 20. While already dedicating significant military resources to securing the route, the regime has on several occasions demanded more funding and military equipment for the task. We assess, however, that the Assad regime's stated military victories in the Qalamoun region, where the majority of attacks on convoys have occurred, will make it more difficult to claim that security issues are preventing transfers.
- Therefore, the Assad regime must balance between its interests in prolonging the disarmament process with pressure from Russia to complete the agreement. Together with Iran, Russia remains the Assad regime's most crucial ally, providing funding, arms, and diplomatic support, and any alleviation of such pressure to adhere to the disarmament agreement is liable to entice the Assad regime to reduce cooperation.
- Under current conditions, we assess that the Assad regime is unlikely to meet the April 27 deadline for the removal of all chemical agents, increasing the potential that the final June 30 deadline for the complete destruction of Syria's chemical weapons program as agreed upon in the September 2013 framework agreement may also be missed. In the event that the June 30 deadline passes with a large amount of the Assad regime's chemical agents remaining inside the country, the United States and European allies are likely to increase diplomatic pressure and threatening rhetoric over action in the UN Security Council. In the event that allegations of chemical attacks persist or increase in the weeks leading up to the June 30 deadline, rhetoric and possible threats of military action by the Obama administration would likely increase accordingly.

The following table outlines possible scenarios which would impact the completion of the OPCW's disarmament process and the anticipated international response.

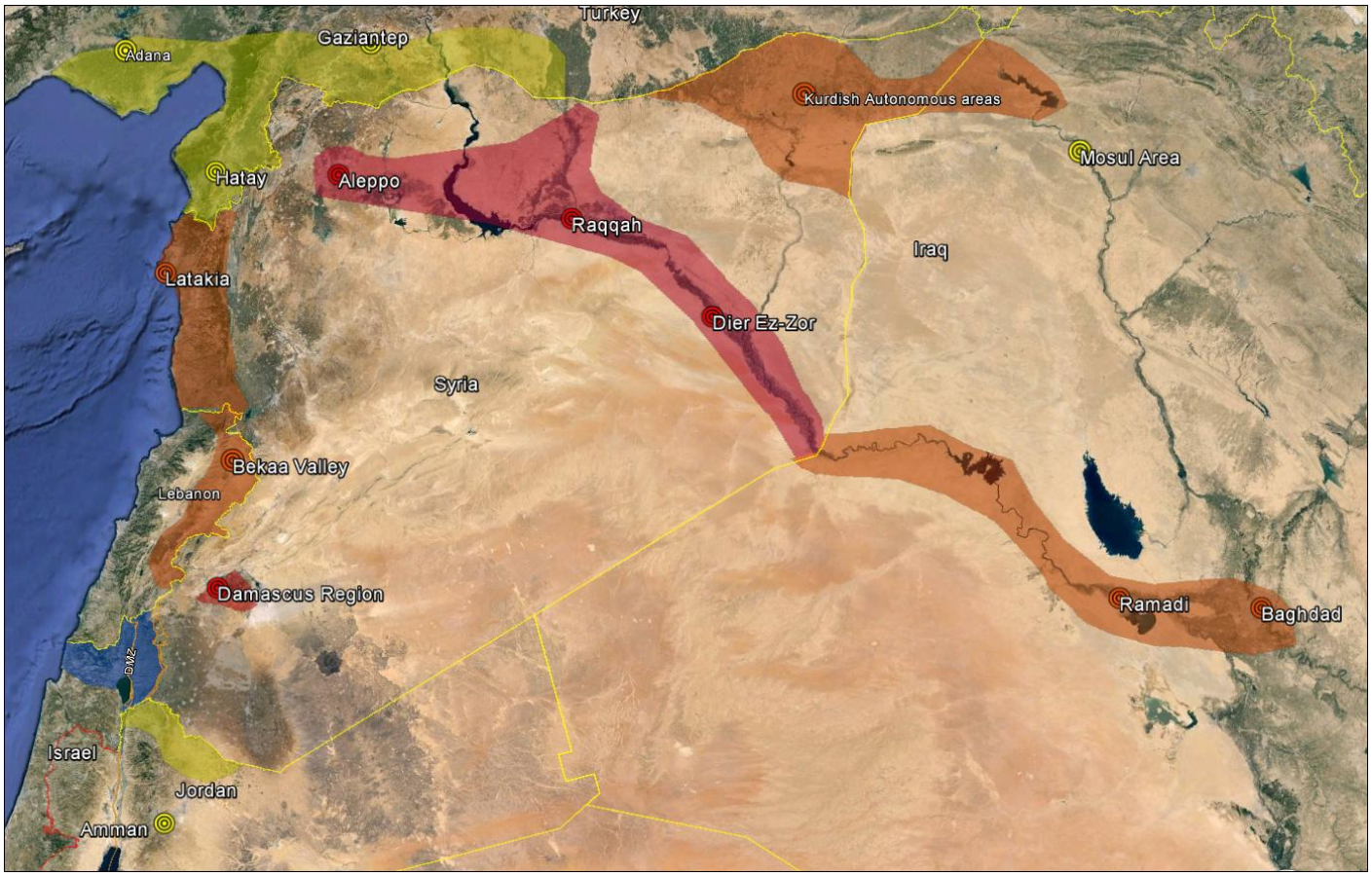
Scenario	Outcome	International Response
• Russia increases pressure on Assad regime to meet June 30 deadline, with assurances of continued conventional military assistance, diplomatic support. • United States pledges to cease arming rebel groups.	**Assad regime completes June 30 deadline.**	❖ United States, European and Regional allies resume pressure on Assad regime to reach political solution to end conflict, increase focus on atrocities carried out with conventional weapons.
• Syrian rebels regain territory in areas along transfer route in Homs, Rif Damashq Provinces, or gain ground in Latakia Province, leading to attacks on convoys or rocket fire on Latakia port. • United States continues to gradually increase support to Syrian rebels. • Russia reduces pressure to complete deadline, continues to assure Assad regime of military and diplomatic support.	**Assad regime insists on delaying June 30 deadline by several weeks.**	❖ United States, European allies threaten to revert to UN Security Council to discuss new resolution on implementing sanctions. ❖ Saudi Arabia increases support to Syrian rebels. ❖ United States threatens to arm moderate rebels unless Assad regime completes disarmament process.
• Syrian rebels regain territory in areas along transfer route in Homs, Rif Damashq Provinces, or gain ground in Latakia Province. • United States continues to gradually increase support to Syrian rebels. • Russia reduces pressure to complete deadline, continues to assure Assad regime of military and diplomatic support.	**Assad regime completes June 30 deadline, but is accused of preserving portions of chemical arsenal.**	❖ United States, European allies threaten to revert to UN Security Council to discuss new resolution on implementing sanctions and possible military action.
• Russia reduces all pressure to meet June 30 deadline. • Rebels advance in key regime strongholds, including Latakia Province and Damascus. • United States increases aid to Syrian rebels in coordination with Saudi Arabia. • Nuclear negotiations between Iran and the P5+1 break down.	**Assad regime ceases all cooperation with OPCW.**	❖ United States, European allies threaten to revert to UN Security Council to discuss new resolution on military action. ❖ Saudi Arabia increases support to Syrian rebels. ❖ United States increases efforts to arm moderate rebels unless Assad regime completes disarmament process.

Assessments: Shifting trends in chemical weapons threats caused by the Syrian conflict

At the time of writing, Syria remains under the highest risk of a future chemical attack, primarily by the Assad regime against rebel-held areas.

Country	Type of threat	Scenarios	Risk level
Syria	Limited attacks using sarin or sarin variants in rebel-held areas of major cities	Assad regime seeks to deter rebel advance or dislodge rebel positions from key suburbs or Damascus, Aleppo, Homs, or outlying areas of Latakia.	Medium-High
	Large scale chemical attack against rebel-held areas causing hundreds of casualties	Rebels advance into central areas of Damascus, Latakia, or Tartus.	Low
	Limited chemical attack against regime-held areas by jihadist rebels using short-range artillery	Syrian rebels successfully acquire or produce chemical substances and knowhow to deploy them on available conventional artillery rockets or mortar rounds.	Medium-high
Turkey	Unsophisticated chemical attack using explosive devices in major cities carried out by Syrian jihadist groups	Syrian jihadists successfully smuggle harmful materials/and or chemical-laden explosive device across the border for attack in major city.	Low
	Limited chemical attack by Syrian military against border towns.	Turkey engages in broad military intervention in northern Syria, prompting retaliation from Syrian military.	Low
Jordan	Unsophisticated chemical attack using explosive devices in major cities carried out by Syrian jihadist groups	Syrian jihadists successfully smuggle harmful materials/and or chemical-laden explosive device across the border for attack in major city.	Low
	Limited chemical attack by Syrian military against border towns.	Jordan facilitates international intervention against Syria, prompting reprisal attacks by the Syrian military.	Low
Iraq	Limited attack by al-Qaeda linked jihadists using short range artillery or homemade explosives against Iraqi military in Baghdad or Anbar Province	Iraqi or Syrian jihadists successfully acquire or produce chemical substances and mount on conventional artillery rockets or mortars	Medium
Israel	Limited chemical attack by Hezbollah using short-medium range	Hezbollah transfers and stockpiles Syrian chemical agents without detection by	Low

	rockets against border communities	Israeli intelligence, deploys on short-medium range artillery rockets during future broad conflict with Israel.	
	Limited chemical attack by Syrian jihadist groups using short-medium range rockets against border communities	Syrian jihadist groups reach vicinity of Israeli border and deploy rockets against Golan Heights communities.	Low
Lebanon	Limited attack by Syrian jihadists using short range artillery or homemade explosives against Shiite areas in the Bekaa Valley or Beirut.	Syrian jihadist groups fire rockets against Hezbollah positions in border areas or successfully infiltrate the country with chemical-laden explosive device.	Low-Medium
GCC nations	Limited chemical attack using homemade explosives in major cities	Al-Qaeda linked jihadist groups smuggle or locally produce crude chemical-laden explosive devices for use in attack in major city, particularly Saudi Arabia.	Very Low



*Shaded regions indicate areas under relative threat of chemical attack by either the Assad regime or extremist groups. Areas in **red** indicate areas under constant risk, areas in **orange** indicate areas under possible risk in the long term, areas in **yellow** indicate lower risk in the long term, and areas in **blue** indicate very low risk.*

Proliferation and threats of attacks by non-state actors

We assess that the Syrian conflict has marginally increased the risk of chemical weapons attacks in the Middle East region, by both directly contributing to the proliferation of chemical agents and indirectly encouraging their use by multiple non-state actors in the region. The Assad regime's use of chemical agents on several occasions during the Syrian conflict without drawing severe consequences from the international community has prompted multiple extremist groups, among them Hezbollah and al-Qaeda-linked jihadists, to increasingly invest efforts to acquire such capabilities. As indicated by the table below, extremist Sunni jihadist groups seek to acquire or develop chemical weapons to increase their prestige, seeking to use such weapons primarily against the Assad regime in Syria and Shiite elements and security forces in Iraq.

Group	Source of proliferation	Possible scenarios for proliferation	Likelihood
Hezbollah	Coordinated transfer from Assad regime	Assad regime transfers chemical weapons into Lebanon for safe keeping or to strengthen Hezbollah's deterrence toward Israel at behest of Iran.	Small amounts of chemical weapons already in Hezbollah's possession. Large transfer currently unlikely due to concerns of Israeli attack.
		Assad regime is ousted from key cities and agrees to transfer large amounts of chemical materials into Lebanon and Iraq.	Low Likelihood. Risk for large transfer to further diminish following completion of OPCW disarmament process.
Islamic State of Iraq and Sham (ISIS)	Production of home-made materials in western Iraq, northeastern Syria.	ISIS already attempting to produce chemical agents, smuggle chemical agents in from Turkey. Videos of testing on animals have been shown on social media.	Low likelihood for successful deployment of homemade weapons on broad scale.
	Theft of chemical materials from Assad regime.	ISIS obtains chemical weapons from captured Assad regime facilities or from seized weapons convoy en route to Latakia.	Low likelihood for deployment of agents due to current lack of access to materials, lack of knowhow.
Jabhat al-Nusra	Theft of chemical materials from Assad regime.	JaN obtains chemical weapons from captured Assad regime facilities or from seized weapons convoy en route to Latakia.	Low likelihood for deployment of agents due to current lack of access to materials, lack of knowhow.
Islamic Front coalition	Theft of chemical materials from Assad regime.	IF obtains chemical weapons from captured Assad regime facilities or from seized weapons convoy en route to Latakia.	Low likelihood for deployment of agents due to current lack of access to materials, lack of knowhow, lack of motivation to use such weapons.

Recommendations

General awareness and preparation

1. Those operating in Turkey, Jordan, Israel, Lebanon, Iraq, and the Persian Gulf states are advised to remain cognizant of emerging trends and threats regarding chemical attacks.
2. Be advised that risk levels may vary according to location, requiring measured contingency planning protection measures.
3. Be advised that the use of chemical weapons outside of Syria, either emanating from a localized attack by extremist groups or as part of a broad military conflict, would significantly alter security and stability conditions in the region.
4. Consult with Max Security Solutions for recommendations on relevant protection measures and contingency planning in accordance with your areas of operation.

In the event of a chemical attack

1. Move away from the contamination, initially at 90° to the wind and then move to an upwind position. Move to fresh air (as possible).
2. Remain upwind of the hazard and try to find some hard ground (non-absorbent) or a building.
3. Remove outer layers of clothing. Removing external clothing, down to the underwear, can reduce the contamination by as much as 80%. Isolate discarded clothing and treat as contaminated.
4. Blow your nose hard.
5. Thoroughly wash hands with soap and water.
6. Using more soap and water, thoroughly wash any areas of the body believed to be contaminated.
7. Seek extraction and medical help.
8. Burn any items suspected of contamination.

Syria

1. Those operating or residing in Syria are advised to ensure that all personnel have adequate protection measures in the event of a chemical attack.
2. Be advised that the large scale use of chemical weapons by the Assad regime would increase the risk of foreign military intervention, the advent of which would complicate evacuation planning.
3. Continue to avoid rebel-held suburbs of Damascus, Homs, and Aleppo, as these areas are under increased risk of localized chemical attacks in conjunction with conventional military operations.