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House Foreign Affairs Committee

Assad's Abhorrent Chemical Weapons Attacks

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Chairman Royce, Ranking Member Engel, distinguished members of the committee, thank you for inviting me to speak about the Syrian military's indiscriminate attacks including its use of chlorine as a chemical weapon. I am an intensive-care pediatrician and a global public-health specialist. My testimony today is based on the extensive periods that I have spent over the past two years along the Turkish-Syrian border, training doctors who work inside Syria and tracking the devastating public-health consequences of the way the Assad regime has chosen to fight this war by attacking civilians and civilian infrastructure, such as the chlorine bomb attacks on populated neighborhoods and the systematic assaults on doctors and hospitals in besieged and opposition-held areas. Since March 2015, these conventional and chemical attacks have escalated.

The Syrian government's use of chlorine as a chemical weapon is emblematic of its war-crime strategy of waging war by attacking civilians. The September 2013 agreement in which the Syrian regime vowed to relinquish its chemical weapons did not extend to chlorine because chlorine is a dual-use chemical, with vital positive uses for water purification, sanitation, and the manufacture of modern medicines. Indeed, chlorine is so important for public health that the Syrian government has withheld and blocked its delivery to opposition-held areas, thus contributing to epidemics of polio, typhoid, hepatitis, and other contagious diseases in those parts of Syria. This systematic withholding of the primary means to disinfect water can be considered an indirect weapon of mass destruction – a form of biological warfare - because of its devastating public health consequences. However, although minute quantities of chlorine are lifesaving, if inhaled in undiluted form it can cause death in less than thirty minutes. The Syrian government is using this deadly quality of chlorine as a chemical weapon against civilians. The Assad regime has transformed a principal element of public health into a tool of disease and terror.

The Good: Chlorine for Public Health and Private Well-Being

In the United States, we take a constant supply of safe water for granted, and chlorine has been our principal agent of water purification for well over a century. Pasteurization, sanitation, vaccination, and antibiotics—the practical application of germ theory—form the basis of modern medicine. Cholera and typhoid—two bacterial diseases that in the past killed more people than all wars put together—were brought under control in the developed world only by the widespread use of water chlorination. In 1900, typhoid killed more than 25,000 people in the United States; by 1960, that number had dropped to 21. Today, 90 percent of water sources in the United States and Europe rely on chlorine for safe water—still chlorine's most important use. Only chlorine safely decontaminates our sewage and ensures water's purity all the way to the kitchen tap.

We also use chlorine to whiten whites in our laundry, sanitize our kitchens, and disinfect our toilets. In hospitals, it is the industrial killing machine of microbes in operating rooms and wards to protect patients from post-op infections and post-partum sepsis. Chlorine compounds form the building blocks for 90 percent of modern drugs: antibiotics and antimalarials, asthma drugs and antihistamines, chemotherapy and cholesterol-lowering agents, anesthetics, common pain-relieving agents like Tylenol, and anxiolytics such as Xanax. PVC (polyvinyl chloride) is used in the manufacture of 85 percent of medical devices: not just sterile gloves, dialysis tubing, urinary catheters and bags for intravenous fluids, but also X-ray films, prosthetics, prescription glasses, and Ebola protection suits. Chlorine is vital in the fight against global threats such as polio, Ebola, and HIV. In Haiti, it is assisting to contain the cholera epidemic; in South Korea, it is helping to contain MERS. Chlorine is thus a key tool for public health and private well-being, assisting in the prevention and treatment of the major causes of disease and death across the developed and developing world.

The Bad: The Denial of Chlorine as an Indirect Weapon of Biological Warfare

In those parts of the world where chlorine is not routinely used for sanitation, safe-water disinfection, and sterilization of hospital equipment, water-borne diseases like cholera, typhoid, and hepatitis A remain major concerns, along with other infectious diseases readily killed by chlorine such as HIV and hepatitis B. That is the situation now plaguing opposition-held parts of Syria. Though barely recognizable after four years of the worst armed conflict since World War II, Syria used to be a middle-income country. For decades, chlorine was routinely used for sanitation and to ensure safe water. The Syrian pharmaceutical industry manufactured sufficient medicines for domestic consumption and export.

For several years before the beginning of the popular uprising in March 2011, and in part contributing to it, the Syrian government denied many public-health measures to politically unsympathetic areas of the country, selectively withholding chlorine for treatment of water as well as routine childhood vaccinations. That deprivation continues today, with widespread denial of chlorine to Hama, Deir Ezzor, Raqqqa, Dara'a, and other areas outside government control. A few drops of bleach would be sufficient to disinfect water and hands, but it is simply unattainable.

The consequences of this deprivation are magnified by mass displacement, with some ten million civilians having been forced to flee their homes. Often three or four families live together in households of appalling and unhygienic conditions. About 425,000 Syrians live under government siege in even worse conditions. Half a million civilians in Eastern Ghouta, a few miles northeast of Damascus, have not had safe drinking water for over three years. In Deir Ezzor, untreated tap water comes directly from the Euphrates River, two hundred yards downstream from a sewage pipe.

As one example, in 2014 there were more than 30,000 cases of hepatitis A across Syria, with many deaths of young children. This disease is rarely seen in the United States, and hardly ever in fatal form. Other diseases, from the annoying to the sinister – lice, scabies, parasites, maggot infestations, post-operative wound infections, and pregnancy-related sepsis—are all now commonplace. The destruction of the pharmaceutical industry in Aleppo in 2012—as part of the government's systematic assault on health care in opposition-held areas—means it is no longer possible to produce antibiotics like Cefaclor, commonly used for chest and ear infections, or antiseptics like chlorhexidine, a routine scrub for surgery.

On February 24 of this year, the World Health Organization (WHO) issued an alert on the risk of cholera in Syria, a concern heightened by the sudden outbreak in Hama in mid-March 2015 of more than 500 cases of acute watery diarrhea. There are no longer any laboratories in opposition-held areas to test for cholera. The constant attacks make adequate surveillance of highly contagious disease like polio and cholera impossible. Previous cover-ups by the Syrian Ministry of Health—of cholera in 2005 and 2009, and of polio's reappearance in 2013, 18 years after it had been eliminated—underscore WHO's concern. Polio, the most devastating disease of childhood, might never have reemerged in Syria if chlorine had still been available for water treatment; poliovirus is extremely hard to kill, and chlorine is one of the few agents capable of destroying it. The Syrian Ministry of Health blamed it on the conflict, but polio did not reappear in neighboring Iraq despite eight years of war (2003-2011). In Syria, however, the withholding of polio vaccination was compounded by the denial of chlorine and deliberate neglect of water-treatment plants. This horrific disease reappeared after less than two years of war, and spread to Iraq in 2014.

The Ugly: Chlorine as a Chemical Weapon of Mass Terror and Destruction

Having made civilians in opposition-held areas suffer from the lack of chlorine for public health, the Syrian government is now, in a cruel irony, making them suffer from too much chlorine—as a chemical weapon. Chlorine's ability to disinfect water derives from its potent oxidizing properties; it rapidly reacts with and inactivates the proteins that hold cells together. If chlorine is not heavily diluted, inhaling it causes choking and can be fatal. In sufficient concentration, it is poisonous to all species of life.

After the August 2013 sarin massacre in eastern Ghouta, Washington and Moscow forced the Syrian government, under threat of military retaliation, to give up a sizable part of its chemical arsenal, including 581 tons of the precursors of sarin and 20 tons of ready-to-use sulfur mustard, both much deadlier than chlorine, neither with any legitimate use. But because chlorine has legitimate uses, the government was not required to eliminate its chlorine stockpiles. Since then, Assad has periodically used chlorine as a weapon—even though such use violates the Convention on Chemical Weapons, which Syria has ratified. The convention prohibits any use of a toxic chemical for military attacks, even if it has parallel positive uses. The Organization for the Prohibition of Chemical Weapons (OPCW) is precluded by its mandate from

identifying the perpetrator of a chemical attack, and Russia is so far resisting UN efforts to create a separate mechanism to do so. But only Syrian government forces have the helicopters that have been carrying out these attacks.

Last year, Assad turned canisters of imported chlorine liquid into ready-made bombs. In April 2014, there were ten attacks in which chlorine was dropped on civilians in villages in northern Syria, killing eight and affecting almost nine hundred. All but one of the attacks occurred at night and involved the aerial dropping of canisters of compressed chlorine liquid, which vaporized into gas upon hitting their target. My own colleagues in Syria, whom I train in critical care, gave me first-hand evidence of these attacks, later reported by the UN Human Rights Council's Commission of Inquiry for Syria and verified by the OPCW report of September 10, 2014.

This year, by contrast, according to the extensive evidence from the ground collected by my colleagues, the chemical bombs are being made locally. Second-hand refrigerant cylinders and air-conditioning tanks appear to be recycled into improvised explosive devices, filled with readily available chemicals routinely used in industry. Chlorine is exceptionally easy to manufacture; common reagents include hydrochloric acid and potassium permanganate. In addition, there is evidence consistent with the use of other chlorine-based toxic gases being produced such as phosgene, first used in WWI.

On March 6, 2015, the UN Security Council (Resolution 2209) condemned the use of chlorine as a chemical weapon, although at Russia's insistence the council did not name the Syrian government as the perpetrator or impose any sanctions. On March 10, coincident with the escalation of the ground-fighting between government forces and opposition militia in the fight for Idleb city, Turkey closed its borders. On March 16, I received phone calls in real time and watched videos sent by my Syrian colleagues showing dying and newly dead children, unbearably vulnerable to the chlorine gas that had just been dropped that night. As it did in WWI trenches, the dense gas sinks to the lowest point—the ground and the basements where people were sheltering, so unlike explosive bombs, there is nowhere to hide from this poisonous gas.

Victims of chemical attacks must be washed, decontaminated, and ventilated, and this should be done in the open where the water can be drained and the gas dispersed. Yet because of the Syrian government's systemic attacks on doctors and hospitals in opposition-held areas, most of the remaining functioning hospitals are now literally underground. That makes the dispersal of gas and the drainage of water slow and difficult, thus endangering medical staff. Many first responders and doctors have been seriously affected.

My Syrian colleagues are used to the density of bloodshed, the trauma and mutilation of even young children. But the fear and suffering of these chlorine attacks have been unbearable, even for them. Gas is silent, and there is nowhere safe from it. Moreover, it is foremost the children who die.

Assad repeatedly denies using chlorine, citing the absence of forensic samples that can be delivered for analysis in laboratories. But his military's destruction of functioning laboratories in opposition-held areas makes such domestic verification impossible. This defense echoes the government's cover-up of the reemergence of polio by saying that it had not been proven in a lab. The closed border with Turkey makes it difficult for Syrian doctors to bring out patients, let alone samples to prove that chlorine attacks are taking place, and impossible for the OPCW to adhere to its own investigative rules.

Even without laboratory proof, the distinctive smell and characteristic effects of chlorine and similar toxic gases leave no question that these were chemical attacks. Further evidence of chlorine used on the March 16 attack on Sarmin was provided to the UN Security Council's April 16 Arria-formula hearing. Since March 16, including during my recent time on the Syrian border, there have been at least two dozen additional chemical attacks consistent with either pure chlorine or a chlorine cocktail, with hundreds of women and children affected, and ten deaths.

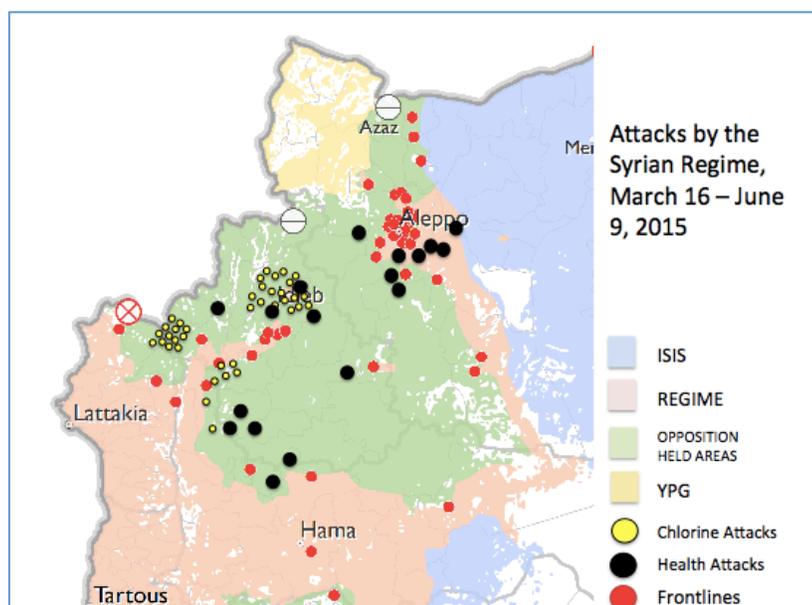
Meanwhile, the most the international community has done is to send atropine (a drug commonly used for emergency resuscitation of victims of chemical agents and other poisons) and chemical decontamination kits. In the eyes of many doctors, that response verges on the obscene. The implicit message is, "We know your government is going to kill your children in the most depraved way possible—and we are not going to stop it, but at least we will be able to say we responded."

Responding to these chemical attacks has been made more difficult by the parallel attacks on healthcare facilities. Compounding the chlorine attacks, in the past two months there have been 36 documented attacks targeting hospitals, health facilities, and aid convoys, 35 perpetrated by the Syrian government forces: 34 these by government airstrikes – mainly barrel bombs (described below) and missiles, but on June 8, Kansafrah Hospital in Idleb was hit by a chlorine bomb shortly after airstrikes on a nearby civilian market killing ten civilians and injuring hundreds more. The government attack on Dara’a hospital was delivered by a car bomb, the single attack by opposition forces on an ambulance was with ground fire. As stressed, only the government has this air capacity. Medical staff, hospital workers, and patients have been killed in these strikes. Government airstrikes also hit 12 ambulances, a Syrian Red Crescent convoy (causing the death of a young woman driving one of its trucks), and a Syrian Civil Defense building, and these attacks have blocked access routes to hospitals.

Meanwhile, the attrition of doctors and health workers continues. A few days ago, the only cardiologist in eastern Ghouta fled, exhausted and despairing after a 900-day shift. Another doctor is leaving this week. There are now 55 doctors left in Ghouta to serve a population of 500,000. To put that in context, within the city limits of Washington, DC, which has a roughly similar population (659,000), there are more than 6,000 doctors. Similarly, there are now only 60 doctors left to serve civilians living in opposition-held Aleppo and 122 left in Homs city. Deir Ezzor city no longer has any doctors, just one unspecialized resident.

Responding to These Attacks

Regarding the use of chlorine as a chemical weapon, it needs more than general condemnation without consequences by a UN Security Council in paralysis. The bombs being used today are old coolant tanks or refrigerator cans, not even the imported liquid chlorine used in 2014. These are not sophisticated bombs using imported ingredients but manufactured locally. No handover of stockpiles can work for chlorine because it is so easy to manufacture more. The industrial reagents used to make chlorine bombs are widely available. Plus, as noted, chlorine is still used for public health and to make legitimate consumer products in various government-controlled parts of the country, so ridding the country of all chlorine is not an option. All the chlorine bombs documented in Idleb and Hama in the last two years have been dropped by helicopters. As the map below the bombs are not targeting ISIS, or even the frontlines, but civilians living in opposition-held areas.



The helicopters delivering chemical bombs are the same that deliver the weapons killing the greatest number of Syrian civilians today: Assad’s barrel bombs—the oil drums or similar canisters filled with explosives and shrapnel, rolled from high-flying helicopters to fall indiscriminately into civilian neighborhoods held by the opposition. A few of these barrel bombs are the improvised devices loaded with chlorine and other chemicals, making them chemical weapons, but most often they contain large quantities of ordinary explosives, causing massive death and destruction wherever they land.

Compared with massive physical trauma and destruction caused by the barrel bombs, chlorine bombs cause relatively few deaths.

Unlike the Syrian military’s August 2013 use of sarin against the people of eastern Ghouta, which killed some 1,400 civilians in a single night, chlorine as a chemical weapon is known to have killed “only” ten people this year. But the relatively small number in no way reflects its capacity as a weapon of terror and permanent psychological damage. Chlorine is extremely cheap and easy to make, and does not require the sophisticated missiles needed to deliver sarin. Hence chlorine cost-effective as a weapon designed to generate maximum fear and terror. There is nothing merciful about watching your child painfully suffocating to death, whether due to sarin, which paralyzes the respiratory muscles, or chlorine, which turns into hydrochloric acid as it is inhaled, drowning kids in the dissolution of their own lungs. I have never seen children die in a more obscene manner. The use of chemical agents leaves a profound and perhaps a

permanent psychological residue rendering the mere threat of using it a powerful weapon. The anthrax attacks in 2001 in the United States killed only three people, but created widespread fear. In wars of attrition such as Syria, where the government's instillation of fear in civilians has long been deliberately used to erode civilian support for insurgents, chemical weapons make perfect, if illegal, sense as a strategy of war.

As noted, this use of chlorine as a weapon violates the Chemical Weapons Convention, and it clearly crosses President Obama's "red line" against the use of chemical weapons. Together, the barrel bombs and chemical attacks create maximum physical damage and psychological suffering. The delivery of these airborne agents of trauma and terror are military helicopters. So the issue is stopping the helicopters.

There has been much talk of no-fly zone established over at least parts of opposition-held Syria. A rigid no-fly zone would be overbroad because the Assad regime does have legitimate reasons to use aircraft, to transport or resupply troops. Given the threat of ISIS, there has been an understandable reluctance to impede Assad's ability to carry out legitimate forms of combat (that is, combatants shooting combatants rather than aircraft bombing civilians), even though the Syrian military has done little to fight ISIS and devoted most of its firepower to other parts of the armed opposition.

I favor establishing a zone in which any bombing of civilian areas is prohibited. The US government should send the clear message: any aircraft that bombs civilians, whether with chlorine or explosives, risks being shot down. Particularly now that a US-led coalition is bombing ISIS, there is no doubt that the Pentagon has a clear view of any Syrian aircraft operating in the region. Moreover, the slow-moving helicopters used to deliver barrel and chlorine bombs could be attacked by missiles launched by the US Navy in the Mediterranean, without the need to deploy US jets and hence to neutralize anti-aircraft systems.

The Syrian government has been extraordinarily sensitive to threats of military force. Beyond relinquishing its chemical-weapon arsenal under such threat, it also has periodically stopped using barrel bombs when it thought they might trigger an international military response. For ten days immediately following the sarin massacre, there were no airstrikes of any kind, nor on the first day of the international coalition airstrikes against ISIS. There is strong reason to believe that Assad's barrel bombing of civilians would quickly stop if a credible threat of military retaliation were made, and certainly, if any bombing continued, by an illustrative retaliatory attack or two. Establishing such a no-bombing zone is not militarily complicated; it is a matter of political will.

So why has the US government not taken this obvious life-saving step, even as it has now engaged militarily in bombing ISIS in Syria and Iraq? Russia will never permit the Security Council to authorize military action in Syria, but Russia's indefinite tolerance for Assad's atrocities should not define America's response. A big reason for US inaction is a misunderstanding of the nature of the barrel bomb. The US government understandably does not want to cripple the Assad regime if that were to mean an ISIS victory, but barrel bombs, whether filled with chlorine or explosives, are not fighting weapons. They are so indiscriminate that the Syrian military does not dare drop them near the front lines for fear of hitting its own troops. Barrel bombs are anti-civilian weapons, excellent for destroying civilian infrastructure – not just hospitals but also schools, shops, farms and factories. Barrel bombs have even been dumped on displaced-persons camps in Idlib, but are not used to fight ISIS.

Syria today is a humanitarian crisis and a public-health catastrophe, with regional and global repercussions. There is yet more life than death in Syria—eight hundred babies are born each month in Ghouta alone. Young children suffer the worst of war, succumbing readily to the disease and chemical gases, and the worst psychological impact. They deserve protection from an inhumane regime that has delivered diseases from the Dark Ages and repeatedly targeted civilians with deadly weapons without any meaningful international response. The international community is now preoccupied by the threat of ISIS, but the people of opposition-held Syria will not provide their essential support to anti-ISIS efforts if we ignore the greater slaughter, disease, and deprivation caused by the Syrian government. The United States could stop the barrel bombs and protect Syrian children and their families without impeding the effort to fight ISIS. And showing that finally the West is willing to stand up to Assad's slaughter of civilians would deprive ISIS of one of its most effective recruiting tools. I hope this committee can prevail upon the Obama administration at long last to act. Thank you.