



# THE SILENT KILLER

**Fridtjof Heyerdahl MD PhD** notes that despite April marking the 26th anniversary of the Chemical Weapons Convention, more than 86 tons of chemical weapons still exist. Here he highlights why this remains reason for concern

**O**n 7 April 2018, an Mi-8/17 helicopter of the Syrian Arab Air Force dropped a yellow cylinder on the rooftop of a three-story residential building in Douma rapidly releasing toxic chlorine gas. It quickly dispersed within the building, killing 43 named individuals before affecting dozens more.

“Unfortunately, some of these chemical warfare agents are easy to produce and store. They can still be produced, and then used by military or non-governmental groups. Some of them you can’t see, some of them you can’t smell and they don’t give any warning. But the impact

is devastating – the victims are burned, blinded, or suffocated. Death is rarely immediate and never painless,” Fridtjof Heyerdahl MD PhD said. He was on a mission to Damascus after the sarin attacks in 2013.

Recently, the Organisation for the Prohibition of Chemical Weapons (OPCW), overseeing the Chemical Weapons Convention, trained professionals to respond in the aftermath of an attack involving chemical warfare agents in Madrid.

OPCW is getting closer to perfect oversight of the chemical industry and more international commitment to not use chemical weapons. Even so, world leaders need to

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simultaneously prepare for any thinkable or unthinkable event, with high quality of medical preparedness across all member states of OPCW. At the OPCW event in Spain, doctors were trained to use new technology, like the EpiShuttle. This is a sealed unit that allows quick isolation and transportation of those who have been exposed to CBRN agents.

“Preparedness is important for both civil accidents and intentional incidents in any modern society”, Heyerdahl said. Heyerdahl founded EpiGuard, the medical technology firm behind the EpiShuttle, where he now serves as chief medical officer, in addition to his work at the Oslo University hospital, the University of Oslo, and his missions with WHO and the ICRC.

Heyerdahl recently came back from an ICRC mission in Ukraine, where he observed: “It was an apocalyptic place; the destruction was unimaginable. You only see scenes like this in apocalyptic movies or video games. The sort of war fought in Ukraine, targeting the military and civil population alike, is something we thought of as a thing of the past. The world now fears the use of chemical weapons in conflict.”

The OPCW Secretariat has received from both the Russian Federation and Ukraine, correspondence regarding threats of use of toxic chemicals as weapons. OPCW remains ready to assist any State Party upon its request, in case of use or threat of use of chemical weapons. Both Russian Federation and Ukraine are parties to the Chemical Weapons Convention.

Syria and its Russian allies vehemently denied that Assad’s forces had been responsible for any chemical attack. A disinformation campaign by the Russian federation and a number of high-profile online activists produced numerous blog posts and in podcasts, claiming that the evidence was fabricated, that corpses were arranged at the site and that children seen foaming at the mouth were faking their symptoms. The Organisation for the Prohibition of Chemical Weapons, overseeing the Chemical Weapons Convention dismissed these theories, providing extensive refutations in a report earlier this year.

Bonnie Jenkins, the US State Department’s undersecretary for arms control and international security commented the OPCW report: “not only makes a thorough case of the Assad regime’s responsibility for the chemical weapons attack” but also: “describes how closely the Syrian regime and Russia were coordinating at the time of the attack.”

After a mission with the ICRC in Mariupol Ukraine, transporting civilians out of the Azovstal steelwork, Heyerdahl witnessed no difficult or complicated medical situations, but he still worries: “Our job was to safeguard the civilians out of the steel plant and my role was also to go around the tents and care for those who needed help. Lack of medication for conditions such as diabetes caused some concern, but on this mission we had no major medical situations. For conflicts in general, the use of chemicals is a significant worry. Still, Egypt, North Korea, and South Sudan have not signed the CWC. Also, world leaders continue to fear chemical weapons in the hands of non-state actor groups such as ISIS, Hezbollah, and al-Qaeda” Heyerdahl said.

It has been 26 years since the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction came into force. Since then, the convention is the most

successful disarmament treaty eliminating weapons of mass destruction in history.

In addition to international conventions not being adhered to, technology is increasingly complicating CBRN assessment. Militaries exploring AI continues to be a controversial issue, and several NATO reports highlight how technological advancements will have a significant impact on the CBRN space in the future.

According to the recent NATO report *The Impact Of Scientific And Technological Progress On CBRN Defence Towards 2030*, we must expect new CBRN threats to emerge due to technological development. Former Google CEO Eric Schmidt has expressed concerns about generative AI being able to create killer biological viruses.

“Viruses turn out to be relatively simple to construct,” he said. “An AI system using generative design techniques, plus a database of how biology actually works, and a machine that makes the viruses, which do exist, can start building terrible viruses,” Schmidt said during an online discussion with the Carnegie Endowment for International Peace earlier this year. Even before the Chat GPT breakthrough, Schmidt dubbed AI-powered biological warfare the “biggest issue” of AI and a “near-term concern”.

## THE REALITY IS THE USE OF CHEMICAL WEAPONS REMAINS A THREAT TO GLOBAL SECURITY

On the other hand, new technologies will also make it possible to develop new protective measures, new training methods and better detection methods. NATO’s report *Science and Technology Trends: 2020-2040* from 2020 highlights several threats and benefits. Artificial intelligence, biotechnology, and autonomous systems have the potential to enhance detection and identification capabilities, improve protective measures, and increase the speed and efficiency of response operations.

One way in which AI could be used as a countermeasure is in the development of predictive models that can help to identify the likelihood of a biological or chemical threat emerging in a particular location. These models could analyse a range of data sources, including environmental and epidemiological data, and provide early warning of potential threats.

As technology and means of protection advances, the race for improving preparedness is difficult to keep track of. Sensors and laboratories can detect substances quicker than before, but drones can also more effectively deliver hazardous substances. New possibilities to analyse threats also constitute a huge privacy dilemma. There is still a need for more research within the area, giving bad actors without moral concerns an edge.

Along with the covid pandemic, protective equipment technology has also made a major leap forward. Technologies like modern isolation units keep first responders safe, while treating and transporting patients. When the EpiShuttle was launched in 2015, it filled a gap in safe transportation of contaminated or infectious patients, protecting first responders from

cross-contamination, while at the same time allowing for intensive care.

“The standard A2P3 filter will in addition to particles also filter organic gases and vapours with a boiling point above 65°C. This covers most of the warfare agents. If a CBRN filter is selected, also inorganic gases, ammonia and organic amines, and mercury compounds are covered. Today, there are a variety of different filters that can be selected for specific filtering and the technology continues to develop, Michael Eimstad,” CEO of EpiGuard explained.

## “THE SORT OF WAR IN UKRAINE IS SOMETHING WE THOUGHT OF AS A THING OF THE PAST”

The OPCW continues to prepare for an incident facilitating training sessions using the latest in technology like EpiShuttles, as do health institutions around the world. The prehospital services at Region Midtjylland in Denmark performed the first ever helicopter transport of a Covid-19 patient with an EpiShuttle. Their team continues to undergo quarterly training sessions to develop best practice and prepare for missions.

“The training includes among other things standard training sessions with PPE and complete mission training with the EpiShuttle in use, meaning planning and transporting a patient from a hospital or a civilian home,” explained Bo Elbæk, when working as head of the Health Preparedness Department. The prehospital services in Region Midtjylland are also set for regular two-days training sessions with the military every second year.

The European civil defence has been forced to brush dust off of old contingency plans, with the UN Secretary General António Guterres recently warning: “The prospect of nuclear war is now back within the realm of possibility.”

As a response to new threats, both accidental or intended, security issues have gone from being mostly a state matter, to include business, organisations and civil society.

“We experience especially military and prehospital services coming together in planning for preparedness, finding standard equipment like the EpiShuttle to work seamlessly across organisational boundaries,” says Michael Eimstad.

As for preparedness to CBRN incidents, the OPCW continues to play a crucial role. In addition to coordinating, monitoring and regulating the production and trade of chemicals, the organisation continues to push for national implementation of the convention.

The anniversary of CWC is worth celebrating because the organisation represents results that were only possible through extensive international cooperation between the 193 member states. Since its conception, more than 4,300 inspections of industrial chemical facilities have been conducted, 98 percent of the global population now live under the protection of the convention and 99 percent of the chemical weapons stockpiles declared by possessor states have been verifiably destroyed.

On the other hand, there are setbacks that make it impossible to be content, even with all these wins. As this year also marks Syria’s 10-year anniversary of being a signee since 2013, signing the convention is clearly not the same as preventing attacks from happening. Moreover, there are still countries that have not joined the Chemical Weapons Convention, and there is still concern that non-state actors may obtain chemical weapons. Furthermore, the OPCW continues to push for member states to complete their national implementation.

As the world celebrates the chemical weapons convention, we must also acknowledge the fact that atrocities happened in Syria only a few years ago. The reality is that the use of chemical weapons remains a threat to global security. Overall, the risk of an attack is just a fraction of what it was during WWI. The problem is that even with improved capabilities, we have no way of knowing for certain where, how and when the next attack will happen. What nations can do is to stay prepared and mission ready ●

**Fridtjof Heyerdahl MD PhD** is Chief Medical Officer and founder of EpiGuard. When he is not working with the EpiShuttle he works with Oslo University hospital, the University of Oslo and does missions with WHO and the ICRC.

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