



TOBBMUN^{'26}

TURKIYE ODALAR VE BORSALAR BIRLIGI SCIENCE HIGH SCHOOL
MODEL UNITED NATIONS CONFERENCE

OPCW

UNDER SECRETARY GENERAL:

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Table of Contents

- 1. Welcoming Letters**
 - 1.1. Letter from Secretary Generals**
 - 1.2. Letter from Under-Secretary General**
 - 1.3. Letter from Academic Assistants**
- 2. Introduction to the Committee**
 - 2.1. Establishment of OPCW**
 - 2.2. History and Past Activities of the Committee**
 - 2.3. Authorities of OPCW**
 - 2.4. What is a Chemical Weapon?**
- 3. Introduction to Agenda Item: Strengthening International Cooperation to Prevent the Re-emergence of Chemical Weapons**
- 4. Essential Chemical Weapons**
 - 4.1. Lethal Agents**
 - 4.1.1. Nerve Agents**
 - 4.1.2. Choking Agents**
 - 4.1.3. Blood Agents**
 - 4.1.4. Blister Agents**
 - 4.2. Incapacitating Agents**
 - 4.2.1. Riot-control Agents**
 - 4.3. Industrially Available Toxic Chemicals**
 - 4.4. Future Biological Weapons**
- 5. History of Chemical Weapon Usage**
 - 5.1. Ancient and Medieval Times**
 - 5.2. WWI Period**
 - 5.3. WWII and Aftermath**
 - 5.4. 21st Century**
 - 5.5. 2018 Douma Attack**
- 6. Key Terms and Major Agreements**
 - 6.1. Chemical Weapons Convention (CWC)**
 - 6.2. Weapons of Mass Destruction (WMD)**
 - 6.3. The Geneva Protocol**
 - 6.4. Global Chemists' Code of Ethics (GCCE)**
 - 6.5. Definition and Classification of War Crimes**
 - 6.6. The Hague Ethical Guidelines**
 - 6.7. The Chemical Professional's Code of Conduct**
- 7. Usage of Chemical Weapons and Possible Threats for Today**
 - 7.1. Russo-Ukrainian War**
 - 7.2. Terroristas**

- 8. Questions to be Addressed (QTBA)**
- 9. Bibliography**

1. Welcoming Letters

1.1. Letter from Secretary Generals

Honourable participants of TOBBMUN'26,

As the Secretaries-General of TOBBMUN'26, taking place from January 17th to January 20th, we would like to extend our warmest welcome to all participants of this prestigious conference.

With its first official edition, and this year's first conference in Antalya, of TOBBMUN, we are proudly bringing together enthusiastic and passionate individuals eager to experience, witness the best instance of diplomacy, collaboration, and intellectual exchange at its finest. As the year and institution's first conference in Antalya, we are confident that we will not only achieve but we will even surpass our motto.

Throughout the path we took in the MUN circuit, we have worked hard and tirelessly to build this conference upon the foundation of experience, dedication, and innovation. With the knowledge and expertise we have gained, we want to shed light on your experience as well and help you feel the same joy we did while creating and attending such committees.

With a blend of experienced and new generation of academic members, we strongly believe that TOBBMUN'26 will provide an unparalleled MUN experience for all of its participants. The seasoned members of our academic team contribute their deep knowledge and insight, while the newer members bring forward creativity and fresh perspectives.

We hope and believe that this conference will grant all participants a platform and an opportunity for all attendees to develop and acquire skills, learn how the dynamics of different specialized committees work, and engage in a constructive way. By organizing TOBBMUN'26, we are not only trying to create something remarkable but also to inspire and contribute to the growth of new members and delegates within the MUN community.

To achieve this, we have brought an academic team of unparalleled intellect and proven capability, supported by an organization team marked by its commitment and strength. When you attend TOBBMUN'26, you will start your MUN year at the very peak of excellence and in the rest of the year, you will continue striving to reach even higher summits.

Welcome to TOBBMUN'26,

With our warmest regards,

Secretaries – Generals of TOBBMUN'26,

Kuzey Karlık & Mustafa Aslan.

1.2. Letter from Under-Secretary General

Fellow Delegates,

It is an immense honour for me to welcome you all to TOBBMUN and this amazing committee OPCW. Throughout the conference I will be serving as your Under-Secretary General and I believe that this committee will be a great experience for you.

Furthermore I would like to give my special thanks to the Executive Team of this prestigious conference for inviting me to be an Under-Secretary General in this conference and making this committee come true.

I am sure that all of you will find chances and do your best to improve yourselves and get better in all aspects in this conference. But please do not forget to have fun while learning new things, especially in our committee.

If you have any kind of questions whether it is about the procedure of the committee or the study guide please do not hesitate to contact me.

Sincerely,

Under Secretary-General of OPCW

Mehmet Emre KUŞ
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1.3. Letter from Academic Assistants

Esteemed Delegates,

We are Doruk Şentürk & Mehmet Emre Uyanık, committee's two Academic Assistants alongside our dear supercalifragilisticexpialidocious Under Secretary-General Mehmet Emre Kuş. We are looking forward to conduct this exciting committee in the best way possible for this outrageous conference.

We really believe that in this conference and especially in this committee you are going to find a lot of chances to improve your social and language skills effectively. But in order to ensure this we expect you to read this study guide carefully and do some extra research about your countries' policies upon our agenda item before the beginning of our committee.

In addition, we want to thank the Executive Team whose are the best teammates Kuzey Karlık and Mustafa Aslan. Lastly we would like to say that you can reach out to us whenever you have any kind of questions via our phone numbers down below. Please do not hesitate to ask your questions, it is essential to make our committee work better.

We wish the best of luck followed by unique success to you all!

Academic Assistants of OPCW

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2. Introduction to the Committee

This Study guide is for you delegates to comprehend the committee, agenda item. This guide has all the basic information that is needed in the committee. (It is enough but further research upon the topic would be great). In order to understand everything about the committee, firstly the importance of the **Organization for the Prohibition of Chemical Weapons (OPCW)** should be understood.

2.1. Establishment of OPCW



The Organization for the Prohibition of Chemical Weapons was founded alongside the entry into force of the Chemical Weapons Convention (CWC) on 29 April 1997, becoming the international implementing body tasked with eliminating chemical weapons worldwide. Its mandate includes banning the development, production, stockpiling, and use of chemical weapons; overseeing the destruction of existing stockpiles;

verifying compliance through inspections; monitoring the chemical industry to prevent the re-emergence of weapons; and facilitating international cooperation and assistance to protect against chemical threats. Today, the OPCW comprises 193 Member States and remains central to global disarmament efforts and the prevention of chemical warfare.

2.2. History and Past Activities of the Committee

As it has already been said the Organization for the Prohibition of Chemical Weapons was founded alongside the entry into force of the Chemical Weapons Convention (CWC) on 29 April 1997. OPCW was created as the implementing body which Headquartered in The Hague, Netherlands. OPCW was tasked with verifying compliance, conducting inspections, and overseeing the destruction of declared chemical weapons stockpiles.

In its early years OPCW focused on supervising the destruction and clearing off the massive stockpiles which were held by major powers. Countries such as the United States and Russia declared tens of thousands of tons of chemical agents, and the OPCW monitored their gradual elimination through carefully verified processes. This was a monumental task,

requiring years of inspections, technical expertise, and international cooperation. At the same time, inspectors began visiting chemical industry sites worldwide to ensure that toxic chemicals were not being diverted for weapons purposes. These inspections were not limited to military facilities; they extended to commercial plants producing dual-use chemicals, ensuring that industrial chemistry remained focused on peaceful applications. The OPCW's early work laid the foundation for global trust in the Convention, demonstrating that even the largest and most complex stockpiles could be dismantled under international supervision.

From the 2000s onward, the OPCW expanded its role to include investigations of alleged chemical weapons use. A major turning point came in 2013, when chemical attacks in Syria prompted the OPCW to deploy inspectors under challenging conditions. Their findings confirmed the use of sarin and chlorine gas, reinforcing the importance of the Convention and the need for continued vigilance. In recognition of its extensive efforts to eliminate chemical weapons and respond to violations, the OPCW was awarded the Nobel Peace Prize in 2013. This honor highlighted the organization's success in reducing global stockpiles and its role as a guardian of international law against chemical warfare.

Beyond disarmament, the OPCW has invested heavily in training, technical assistance, and international cooperation. It helps member states strengthen their national implementation measures, improve emergency response capabilities, and promote peaceful uses of chemistry in industry, medicine, and agriculture. These programs are vital for countries with limited resources, ensuring that all members can meet their obligations under the Convention. A historic milestone was reached in July 2023, when the last declared chemical weapons stockpiles under the CWC were officially destroyed. This achievement marked the culmination of decades of work and demonstrated the effectiveness of international cooperation in eliminating one of the deadliest categories of weapons. The destruction of these stockpiles was not only a technical triumph but also a political one, showing that sustained commitment by states and international institutions can achieve complete disarmament in a critical area of global security.

Even though declared stockpiles have been destroyed the OPCW's mission is not done, it continues because of a couple reasons. There are new technologies and methods that might be OPCW that haven't been discovered yet. Also, Chemical Weapon's development, production and stockpiling is considerably easy. All you need is basic materials, an appropriate lab and lastly a professional chemist. Does not have to be Heisenberg level chemist but a good one. Non-state actors such as terrorist groups may produce Chemical Weapons in this way. Lastly, OPCW has increased global trust and cooperation between countries. Thus, the OPCW is not just a disarmament body of the past, but a guardian of the future, ensuring that chemical weapons never return as a threat to humanity.



Image: Werner Heisenberg

2.3. Authorities of OPCW

The OPCW's authorities are based on the provisions of the Chemical Weapons Convention (CWC) and its annexes on verification and confidentiality. This Convention defines in detail the declaration obligations of states, the procedures for conducting inspections, rules for sampling and data confidentiality, the challenge inspection process, mechanisms for detecting non-compliance and imposing measures, as well as assistance and protection mechanisms. The aim is both to ensure deterrence and verification power, and to guarantee the uninterrupted continuation of peaceful chemical activities.

- **Declaration Obligations and Routine Inspections**

Each State Party establishes a “National Authority” to submit declarations to the OPCW regarding chemicals and facilities covered by the CWC. This includes data on the production, processing, consumption, and stockpiles of Schedule 1–2–3 chemicals; their use in research, medicine, and pharmaceuticals; import/export movements; and information on old or abandoned munitions and production facilities. The Schedules listed in the Verification Annex determine the scope and frequency of inspections. Schedule 1 chemicals intended for warfare or with almost no legitimate use are subject to the strictest regime. They are mostly permissible in research purposes and not more. Schedule 2 (limited legitimate use) is closely monitored. They are toxic chemicals or precursors critical for producing chemical weapons. Schedule 3 (widely used industrial chemicals) is subject to broader declarations and selective inspections. Schedule 3 Chemicals produced on a large scale for industry but also usable in chemical weapons production. “Other Chemical Production Facilities” (OCPF) are also covered under a risk-based approach.

The OPCW Technical Secretariat prepares inspection programs based on risk and declaration data. Notification periods vary depending on facility type (shorter for Schedule 1), and inspection team sizes are defined. Teams review records, verify processes, check materials and equipment, monitor production/processing lines, and examine stockpiles and shipments. Environmental or process samples may be taken if necessary. Samples are handled under strict chain-of-custody procedures and analyzed in OPCW-designated laboratories. Findings are reflected in inspection reports in a technical and impartial manner. Reports are strictly investigated. If something extraordinary is found in the reports OPCW takes action by demanding the reduction or peaceful destruction of illegal material and requesting declarations more often. The State Party must present a scheduled plan to address violations: additional declarations, destruction of munitions/facilities, capacity restrictions, legislative amendments, or repeat inspections. In cases of persistent non-compliance, the Conference may consider collective measures such as suspension of rights, halting technical cooperation,

or reporting to the UN. In this way OPCW protects its status as a trusted inspector organ and a peaceful action body.

- **Challenge Inspection**

Any State Party may request a challenge inspection of another state's facility if there is serious suspicion of non-compliance. The request must include justification and sufficient information about the target location. Once the request reaches the OPCW, an accelerated timetable begins. The inspected state must provide immediate access, and OPCW teams begin on-site examination, record review, and sampling. The inspection report is quickly submitted to the Executive Council. If non-compliance is indicated, corrective action plans, additional inspections, or political/diplomatic processes are triggered.

Even though it is a legal process challenge inspection had never happened. This mechanism exists in the convention and it is a powerful verification system. Yet political sensitiveness among parties obstructed the usage of this process. A challenge inspection means one state directly accuses another of non-compliance. This could create major diplomatic tensions, so states have generally avoided using this mechanism. In cases of suspicion, the OPCW has usually tried to resolve issues through consultation, requests for clarification, and routine inspections. This is a less confrontational approach. Even though it has never been carried out, the mere existence of the challenge inspection mechanism is itself a deterrent. States know that if they run a secret program, this mechanism could be invoked.

- **Assistance, Protection, and Capacity Building**

States Parties may request assistance in the event of chemical threats/attacks. The OPCW can provide equipment (protective clothing, detection devices), expertise, and training, and coordinate international response. Assistance includes drafting legislation, licensing/authorization processes, customs and border control training, industry compliance programs, and emergency response exercises. Projects promoting the peaceful use of chemistry in health, agriculture, and industry are supported, alongside security and ethical frameworks to prevent misuse.

These are the main authorities of OPCW and could use these powers anytime, anywhere and under any circumstance. OPCW has more authority than an ordinary General Assembly (GA) committee. So delegates may try extraordinary things that are not done in the GA committees.

2.4. What is a Chemical Weapon?

According to the Chemical Weapons Convention, a chemical weapon is:

Any toxic chemical that can cause death or harm to humans or animals through its chemical action on life processes.

Any chemical precursor used to produce a toxic chemical.

Any munitions or devices designed to inflict harm or cause death through the release of toxic chemicals. This could include mortars, artillery shells, missiles, bombs, mines or spray tanks.

Any equipment designed to be used with munitions and devices identified as chemical weapons.

These are according to the CWC and they are actually self-explanatory. Although in order to comprehend it further we will be explaining it in detail.

The Convention defines any toxic chemical substance as chemical weapon if it may cause any death, temporary biological dysfunctions or direct permanent harm against humans and animals through its chemical chemical action process. So the danger is about the chemical's ability to affect biological systems by disrupting them. So a chemical weapon does not have to appear as a classic firearm such as a gun, machinegun, cannonball or in a bullet. For example, nerve agents interfere with the nervous system, while choking agents damage the lungs. Even if such chemicals are not weaponized, their mere potential to harm makes them subject to strict regulation under the CWC.

Chemical precursors are the raw materials or intermediate substances used to manufacture toxic chemicals. The Chemical Weapons Convention (CWC) treats them as chemical weapons because controlling only the final toxic agents would leave a loophole: states or groups could stockpile the ingredients and quickly produce dangerous agents when needed. By regulating precursors, the CWC essentially cuts off the supply chain before harmful substances can even be created. The inclusion of precursors ensures that the Convention doesn't just ban the "end product" but also the means of production. This is



critical because many toxic agents can be synthesized relatively quickly if the right precursors are available. For instance, mustard gas can be produced from relatively common industrial chemicals if they are not controlled. In practice, the Organization for the Prohibition of Chemical Weapons (OPCW) monitors the production, transfer, and storage of these precursors worldwide.

States must declare their activities involving scheduled chemicals, and inspections verify that they are used only for peaceful purposes such as pharmaceuticals, agriculture, or industry. So it is OPCW's duty to monitor these actions.

The Convention also includes weapons systems—such as bombs, artillery shells, missiles, mines, or spray tanks—that are specifically designed to deliver toxic chemicals. These devices are considered chemical weapons because their sole purpose is to spread harmful agents in combat or attacks. By banning these delivery systems, the CWC closes loopholes that might otherwise allow states to claim they are not violating the treaty while still possessing the means to deploy chemical agents.

Finally, the Convention covers equipment designed to be used with chemical munitions or devices. This includes specialized machinery or tools that enable the storage, handling, or dispersal of toxic chemicals. Even if such equipment does not directly release chemicals, its role in facilitating the use of chemical weapons makes it part of the prohibited category. This provision ensures that all aspects of chemical warfare infrastructure are dismantled, preventing indirect support for chemical attacks.

3. Introduction to Agenda Item: Strengthening International Cooperation to Prevent the Re-emergence of Chemical Weapons

It is essential for you, delegates, to understand our agenda item and what exactly it covers in order to better understand how our committee is going to work and what you need to study for. When you truly understand the agenda item it becomes easier to do more quality research upon it and be well prepared for the committee.

Chemical weapons still remain as a serious threat to humanity and a dangerous misapplication of the chemical sciences. Traditional chemical warfare agents (CWAs) such as sarin and mustard agent are designed to kill or maim, and some industrially useful chemicals, such as chlorine and phosgene, have been and may in the future be misused as weapons. The ongoing risk of the misuse of chemicals underlines the importance of observing the usage of chemicals in order to prevent the re-emergence of chemical weapons and the possible harms they may cause for humanity.

Chemical weapons are prohibited by the 1993 Chemical Weapons Convention (CWC), which entered into force in 1997 and had 193 states parties as of December 2024. The Organisation for the Prohibition of Chemical Weapons (OPCW) oversees the implementation of the CWC and is responsible for verifying chemical weapon disarmament and helping to ensure that toxic chemicals are used only for purposes not prohibited by the CWC. Since the last of the chemical weapon stockpiles declared by CWC states parties were

destroyed in 2023, under OPCW verification, the focus has shifted further to the prevention of the re-emergence of chemical weapons.

The production and stockpiling of chemical weapons has been banned since 1997 under the terms of the Chemical Weapons Convention (CWC). However, their documented use in current conflicts, both by states and non-state actors, has sparked renewed concerns. Furthermore, scientists and policy makers recognize a growing convergence of chemistry and biology. The cross-disciplinary research has provided new insights into chemical action on life processes, leading to greater knowledge regarding what kinds of chemicals are toxic. With this convergence, comes the potential to produce toxic chemicals in ways that are difficult to monitor. As a result of these developments, there is international emphasis on preventing the reemergence of chemical weapons, whether produced by traditional chemical processes or bio-mediated production.



For several years now, attention has gradually been shifting to future challenges and the ways in which the OPCW can set new policy priorities to meet them. Such future challenges include the impact of science and technology on the convention, and the possibility of new types of toxic agents (including incapacitants) and delivery systems. Industrial chemical production processes have changed considerably since the treaty became operational, as has the trade in chemicals and transfer of technology across the world. The organisation's routine functions of verifying pertinent industry activities will continue, even though it is clear their definition of purpose and certain modalities and procedures will soon require major updating to retain their relevance.

There are no clear international standards or legal obligations to ensure the security of chemicals that can be used to make chemical weapons. Although some State Parties to the Chemical Weapons Convention have developed strong systems for chemical safety, few countries have a solid basis in policy and law for chemical security.

Because some countries do not yet have national legislation that effectively puts the Convention into effect, the OPCW assists them in doing this as quickly as possible. The organisation also provides training, for example, to train suitable personnel, who can then act as first responders in the event of possible chemical attacks. The trained experts can also apply for positions with the OPCW; regions such as Africa, Latin America and Asia are still under-represented in the organisation and the OPCW also makes efforts to attract more women.

The OPCW is also in the process of developing a culture of prevention, for which it collaborates with the chemical industry and the scientific community. It invests considerable resources in regional and national capacity building in areas such as chemical security and safety, emergency response, forensics, and laboratories, as well as in education and outreach to key stakeholder communities. International cooperation and technology exchanges for peaceful purposes and assistance are equally key to maintaining global interest in the CWC.

For the goal of achieving the prevention of the re-emergence of chemical weapons, strengthening international cooperation is a key factor. International cooperation helps to increase the efficacy of monitoring mechanisms, to improve the safety and security of manufacturing processes and to prevent the weaponization of chemicals. Formal and informal educational providers, enterprise, industry and civil society should cooperate to equip anybody working in chemistry and others with the necessary knowledge and tools to take responsibility for the benefit of humankind, the protection of the environment and to ensure relevant and meaningful engagement with the general public.

Teachers, chemistry practitioners, and policymakers should be aware of the multiple uses of chemicals, specifically their use as chemical weapons or their precursors. They should promote the peaceful applications of chemicals and work to prevent any misuse of chemicals, scientific knowledge, tools and technologies, and any harmful or unethical developments in research and innovation. They should disseminate relevant information about national and international laws, regulations, policies and practices.

Member states should promote the exchange of scientific and technical information sharing relating to the development and application of chemistry for peaceful purposes in order to increase international cooperation and to ensure that all member states can implement all the necessary regulations regarding the misuse of chemicals.

4. Essential Chemical Weapons

The toxic component of a chemical weapon is called its 'chemical agent'. Based on their mode of action (i.e. the route of penetration and their effect on the human body), chemical agents are commonly divided into several categories: choking, blister, blood, nerve and riot control agents. Chemical agents become weapons when they are placed into artillery shells, land mines, aerial bombs, missile warheads, mortar shells, grenades, spray tanks, or any other means of delivering the agents to designated targets.

Not all poisonous substances are considered suitable for weaponization, or use as chemical weapons. Thousands of such chemical compounds exist, but only a few dozen have been used as chemical warfare agents since 1900. The compounds of most utility must be highly toxic but not too difficult to handle. Furthermore, the chemical must be able to withstand the heat developed when delivered in a bursting shell, bomb, mine, or warhead.

Finally, it must be resistant to water and oxygen in the atmosphere in order to be effective when dispersed.

4.1. Lethal Agents

4.1.1. Nerve Agents

The most lethal and important chemical weapons contain nerve agents, which affect the transmission of impulses through the nervous system. A single drop on the skin or inhaled into the lungs can cause the brain centers controlling respiration to shut down and muscles, including the heart and diaphragm, to become paralyzed. Poisoning by nerve agents causes intense sweating, filling of the bronchial passages with mucus, dimming of vision, uncontrollable vomiting and defecation, convulsions, and finally paralysis and respiratory failure. Death results from asphyxia, generally within a few minutes of respiratory exposure or within hours if exposure was through a liquid nerve agent on the skin. Defense against nerve agents requires a skintight gas mask and special protective overgarments.



In the mid-1930s chemists working for the German chemical corporation IG Farben developed the first organophosphorus compound with an extremely high toxicity; this became the nerve agent known as tabun (GA). As much as 12,000 tons was produced for the German army in World War II, although it was never used. Another nerve agent, sarin (GB), was first produced in 1938, and a third, soman (GD), was introduced in 1944; both were also invented in Germany. These three German nerve agents, the G-series (for German) in U.S. nomenclature, were all seized in large quantities by the Allies at the end of World War II. After the war the United States, the Soviet Union, and a number of other states also produced these and other nerve agents as weapons.

VX, the most famous of the so-called V-series of persistent nerve agents (and also the deadliest known nerve agent; V is for *venom*), was developed by chemists at a British government facility in 1952. Britain renounced all chemical and biological weapons in 1956 but traded information on the production of VX with the United States in exchange for technical information on the production of thermonuclear bombs. In 1961 the United States began large-scale production of VX. The only other countries believed to have built up VX arsenals were the Soviet Union, France, and Syria. Following the signing of the CWC in 1993, the United States and Russia began the elimination of their chemical weapons stocks, with a goal of finishing the process by 2012; neither country trains its forces with such weapons at present.

Defense against nerve agents requires a skintight mask and effective protective overgarments.

4.1.2. Choking Agents

Choking agents were employed first by the German army and later by the Allied forces in World War I. The first massive use of chemical weapons in that conflict came when the Germans released chlorine gas from thousands of cylinders along a 6-km front at Ypres, Belgium, on April 22, 1915, creating a wind-borne chemical cloud that opened a major breach in the lines of the unprepared French and Algerian units. The Germans were not prepared to exploit the opening, which gave the French and Algerians time to rush reinforcements into the line. Eventually both sides mastered the new techniques of using choking agents such as chlorine, phosgene, diphosgene, chloropicrin, ethyldichlorasine, and perfluoroisoboxylene and launched numerous attacks though without any militarily significant breakthroughs once each side had introduced the first crude gas masks and other protective measures. Phosgene was responsible for roughly 80 percent of all deaths caused by chemical arms in World War I.

Image: Australian soldiers wearing respirator gas masks at the Battle of Ypres, 27 September 1917, Colorized



Choking agents inflict injury mainly on the respiratory tract, that is, they irritate the nose, throat, and especially the lungs. They are delivered as gas clouds to the target area, where individuals become casualties through inhalation of the vapor. The toxic agent triggers the immune system, causing fluids to build up in the lungs, which can cause death through asphyxiation or oxygen deficiency if the lungs are badly damaged. The effect of the chemical agent, once an individual is exposed to the vapor, may be immediate or can take up to three hours. A good protective gas mask is the best defense against choking agents.

Because they sink into and fill depressions, they were well suited to trench warfare. Their successful use on the battlefield led to research and development programmes to create even more toxic and effective chemical weapons.

4.1.3. Blood Agents

The name blood agent, like those of other groups of agents, derives from its effect on victims. Blood agents, such as hydrogen cyanide or cyanogen chloride, are designed to be delivered to the targeted area in the form of a vapor. When inhaled, these agents



prevent the transfer of oxygen to the cells, causing the body to asphyxiate. Such chemicals block the enzyme that is necessary for aerobic metabolism, thereby denying oxygen to the red blood cells, which has an immediate effect similar to that of carbon monoxide. Cyanogen inhibits the proper utilization of oxygen within the blood cells, thereby “starving” and damaging the heart. Thus, blood agents are poisons that effectively cause the body to suffocate. The best defense against blood agents is an effective gas mask. Examples of blood agents include: hydrogen cyanide (AC), cyanogen chloride (CK) and arsine (SA).

4.1.4. Blister Agents

Blister agents, or vesicants, are one of the most common CW agents. Blister agents were also developed and deployed in World War I. Blister agents were first tested in combat in 1917 by Germany (the primary form of blister agent used in that conflict was sulfur mustard, popularly known as mustard gas) and have been used in several conflicts since, notably in the Iran-Iraq War (1980–88). Casualties were inflicted when personnel were attacked and exposed to blister agents like sulfur mustard or lewisite.

Delivered in liquid or vapor form, such weapons burn the skin, eyes, windpipe, and lungs. The physical results, depending on level of exposure, might be immediate or might appear after several hours. Although lethal in high concentrations, blister agents seldom kill. Deaths typically represent only a small percentage of the casualties they cause. Exposure to blister agents often results in blindness and permanent damage to the respiratory system. Modern blister agents include sulfur mustard, nitrogen mustard, phosgene oxime, phenyldichlorarsine, and lewisite. Protection against blister agents requires an effective gas mask and protective overgarments.

4.2. Incapacitating Agents

A good deal of work has been done on chemicals that can incapacitate, disorient, or paralyze opponents. Experiments have been conducted on a number of hallucinogenic drug compounds (for instance, 3-quinuclidinyl benzilate (BZ), LSD (lysergic acid diethylamide), mescaline, and methaqualone) and at one time the U.S. Army fielded BZ weapons. Those chemical weapons are designed not to kill; however, even incapacitants can cause permanent injury or loss of life if employed in high dosages or if they cause accidents. BZ or LSD may attack the nervous system and derange a victim’s mental processes, causing, for example, hallucinations or psychotic thinking. Other incapacitants might cause victims to sleep or to be slow to respond.

4.2.1. Riot-control Agents

Tear gas and vomiting agents have been produced to control riots and unruly crowds. Commonly used tear gases are chloracetophenone (CN), chloropicrin (PS), dibenz(b,f)(1,4)oxazepine (CR), and *o*-chlorobenzylidenemalononitrile (CS). CN, the principal component of the aerosol agent Mace, affects the eyes chiefly. PS and CS are stronger irritants that can burn the skin, eyes, and respiratory tract. Such riot-control agents are banned by the CWC if used as “a method of warfare” but are allowed for domestic police enforcement.



Riot control agents (RCAs) such as CS were the topic of long and heated debates during CWC negotiations. At issue were their inclusion in the treaty and the restrictions that would be imposed upon their use. In the end, a compromise was reached under which States Parties are to declare to the OPCW the RCAs they possess for law enforcement purposes. Though use is allowed for these purposes, it is prohibited as a method of warfare.

Although the United States signed and ratified the CWC, it has reserved the right to use riot-control agents in certain other situations, including counterterrorist and hostage-rescue operations, noncombatant rescue operations outside war zones, peacekeeping operations where the receiving state has authorized the use of force, and military operations against non-state actors initiating armed conflict.

4.3. Industrially Available Toxic Chemicals

In addition to warfare agents, a large and growing number of potentially harmful chemical compounds can be found in or introduced into the environments of deployed forces. For example, troops could be exposed to propellants, explosives, and pyrotechnic (PEP) hazards, a growing number of toxic industrial chemicals (TICs) and chemicals associated with military materiel. TICs are now a common component of military deployment and military training.

An extensive literature is available on the identification, evaluation, and control of human exposures to harmful industrial/commercial chemicals in both occupational and nonoccupational settings. The number of chemical substances in these categories is large and growing. About 20 million chemical compounds have been identified; 80,000 industrially and

commercially used chemicals, 600 pesticides, and 100 new chemicals being introduced each year (Chemical and Engineering News, 1999; GEO-CENTERS and Life Systems, 1997; NTP, 1999). Not all of these are harmful chemicals.



Approximately 400 chemical substances have been identified by regulatory agencies as potentially toxic and requiring some limitations on exposures. Currently, only 188 substances are listed by the Environmental Protection Agency (EPA) as hazardous air pollutants (EPA, 1998), and 85 chemicals have federal and/or state health-based concentration standards (NRC, 1999). However, these lists continue to expand. Thousands of chemicals have not yet undergone

even a screening-level analysis of their potential toxicity, and thousands more have only undergone limited toxicity studies.

TICs can be organized according to their chemical properties and sources. [Table of Chemical Categories of Toxic Industrial Chemicals](#) provides a list of categories of chemical compounds containing chemicals that have been labeled toxic to humans. The list is not complete, but it gives a sense of the types of substances that should be detected and monitored and the concentrations that should be measured. In each category, examples of toxic chemicals are listed along with the chronic oral reference safe dose (*RfD*) in mg/kg/day, the chronic reference concentration (*RfC*) in mg/m, and (if available) the cancer potency (kg-day/mg). These measures indicate the chemical concentrations that should be detected and monitored to protect troops from low-dose health effects.

Sources of chemically toxic agents for deployed troops also include smokes and obscurants, solvents, products of combustion, metals and metal products, pesticides, fuels, and other industrial and/or military compounds.

4.4. Future Biological Weapons

The types and chemical properties of agents currently being developed or likely to be developed in the next five to ten years should be a subject of inquiry:

There are thousands, maybe even tens of thousands, of "chemical compounds" in existence or proposed that could be considered for use in war depending upon the action required of them from the military point of view, including all the various drugs that are prescribed and taken and those that are not prescribed and taken. Many of these are lethal and incapacitating, even in small doses. (Boyle, 1998, p. 7).

Bioregulator chemicals, for example, could be a threat in future deployments. These chemicals mimic or disrupt hormone signals and could be effective at very low doses.

The risk of naturally-occurring or accidental biological threats adds complexity to the security environment. The COVID-19 pandemic demonstrated the extraordinary capacity of biological disease, regardless of origin, to disrupt the societies and strain their response capacity. Biological pathogens, including both existing and modified pathogens, also pose unique and enduring challenges to military operations, with deployed forces facing the prospect of deliberate use of biological agents by hostile actors, accidental release, and contact with endemic and imported diseases.

Climate change and associated trends are also expected to accelerate the emergence of zoonotic illnesses, including potential pandemic threats. These risks intersect with the proliferation of biological weapons, as new, naturally-occurring pathogens and toxins may be employed, enhanced or weaponised by malicious actors.

While military defence capabilities and civil preparedness support and reinforce each other, they are not interchangeable. Ensuring both military readiness and national resilience demands effective, 2-way civil-military interaction that is appropriately planned, exercised, and resourced. The COVID-19 pandemic has reinforced the importance of cooperation in a crisis.

The agility to understand the future opportunities and anticipate the risks, is underpinned by scientific endeavour. It will help us to mitigate uncertainty and prepare for the future. Decision-making will be enabled by information and data. This early warning will also allow an appropriately rapid response - it will be the foundation for the development of protective and medical solutions.

Strategic investment in technology developments and the ability to exploit these with appropriate infrastructure will accelerate our resilience. The power of advanced computational tools can offer opportunities to rapidly design and prototype novel solutions for example. Partnerships between government, academia and industry are required to coalesce the expertise and knowledge.

Comprehensive and credible response capabilities have a profound deterrent effect, by reducing the impact of any deliberate, accidental or naturally-occurring event. At the same time, those who pursue or use chemical and biological weapons need to be cognisant that the international community will hold them to account using robust scientific evidence.

5. History of Chemical Weapon Usage

5.1. Ancient and Medieval Times

Some of the earliest surviving references to toxic warfare appear in the Indian epics Ramayana and Mahabharata. The 'Laws of Manu' a Hindu treatise on statecraft (c. 400 BC) forbids the use of poison and fire arrows, but advises poisoning food and water. Kautilya's "Arthashastra", a statecraft manual of the same era, contains hundreds of recipes for creating poison weapons, toxic smokes, and other chemical weapons. Ancient Greek historians recount that Alexander the Great encountered poison arrows and fire incendiaries in India at the Indus basin in the 4th century BC.

The earliest recorded use of gas warfare in the West dates back to the fifth century BC, during the Peloponnesian War between Athens and Sparta. Spartan forces besieging an Athenian city placed a lighted mixture of wood, pitch, and sulfur under the walls hoping that the noxious smoke would incapacitate the Athenians, so that they would not be able to resist the assault that followed.



There is archaeological evidence that the Sasanians deployed chemical weapons against the Roman army in the third century AD. Research carried out on the collapsed tunnels at Dura-Europos in Syria suggests that the Iranians used bitumen and sulfur crystals to get it

burning. When ignited, the materials gave off dense clouds of choking gases which killed 20 Roman soldiers in a matter of two minutes.

In the late 15th century, Spanish conquistadors encountered a rudimentary type of chemical warfare on the island of Hispaniola. The Taíno threw gourds filled with ashes and ground hot peppers at the Spaniards to create a blinding smoke screen before launching their attack.

5.2. WWI Period

The first significant gas attack occurred at Ypres in April 1915, when the Germans released clouds of poisonous chlorine. The gas inflicted significant casualties among the British and Canadian forces at Ypres and caused widespread panic and confusion amongst the French colonial troops.

The chlorine was a strong irritant on the lungs, with prolonged exposure proving fatal. The immediate public outcry for retaliation resulted in quick adoption of defensive anti-gas measures including new companies of Royal Engineers responsible for offensive gas warfare. Poison gas was initially released from cylinders, but this required ideal weather conditions and could be very risky. In the first British gas attack, at Loos in September 1915, much of



the gas was blown back into the faces of the British troops. From 1916, gas was employed in shells instead, which allowed attacks from a much greater range.

Gases used included chlorine, mustard gas, bromine and phosgene, and the German Army was the most prolific user of gas warfare. On April 22, 1915 at 5 p.m. a wave of asphyxiating gas released from cylinders embedded in the ground by German specialist troops smothered the Allied line on the northern end of the

Ypres salient, causing panic and a struggle to survive a new form of weapon.

Gas did not prove as decisive a weapon as was anticipated but it was effective in clearing enemy forward positions. As a result, [anti-gas measures](#) became increasingly sophisticated. Primitive cotton face pads soaked in bicarbonate of soda were issued to troops in 1915, but by 1918 filter respirators using charcoal or chemicals to neutralise the gas were common.

Interwar Period

In the period between wars, there were various aggressive acts that involved the use of chemical compounds as a war method; we will mention some of them:

1935-1936. Italian aviation used mustard gas and phosgene during the invasion of Ethiopia. The use of these gases is supposed to shorten the war for Italy. This action marks the first gap opened in the Geneva Protocol. The sanctions imposed by the League of Nations against Italy for this violation did not have an appreciable impact.

1937-1939. Japan uses yperita (a vesicant gas) in its war against China, which will last until 1945. This action had much less international diffusion than that carried out by Italy, since the European events captured almost all the world attention; however, it is a topical issue because hundreds of artillery pieces filled with chemical agents have been discovered in Chinese territory and there is controversy about the responsibility to move and destroy these weapons, which due to their age and mold, they have already wreaked havoc on the civilian population of various populations.

During this period, very intense research was carried out on the development of new and more powerful chemical weapons.

The Germans classified their chemical weapons into four main subdivisions in this period:

"White Cross": Substances such as bromine, chloroacetophenone, or bromoacetic esters, which are irritating but not lethal compounds (known as tear or irritants).

"Green Cross": Suffocating compounds such as chlorine or phosgene, which affect the lungs and cause death from pulmonary edema.

"Blue Cross": Compounds that block the respiratory system, such as hydrogen cyanide, which cause death by suffocation.

"Yellow Cross": The compounds with the greatest dangerous effects, such as mustard gas and Lewisite.

5.3. WWII and Aftermath

Chemical warfare had played an important enough role in World War I that there was widespread expectation of its use in World War II. Certainly, Germany's army and its chemists had no qualms about adding poison gas to the Third Reich's arsenal. When war began, however, many of the latest chemical warfare agents were not available in deliverable form. The early successes of conventional-war making, combined with an increasing shortage of raw material, led Germany to deemphasize gas warfare even apart from the fear of Allied retaliation that significantly influenced at least the armed forces.

In other cases, by the end of World War II, Nazi Germany had produced some 12,000 tons of the deadly chemical compound, enough to kill millions of people. From early in the conflict, high-level military officers pressed Hitler to use sarin against their adversaries. But despite such pressure, Hitler declined to employ it as a chemical weapon against the Allied Powers.

On 6 and 9 August 1945, the United States detonated two atomic bombs over the Japanese cities of Hiroshima and Nagasaki, respectively, during World War II. The aerial bombings killed 150,000 to 246,000 people, most of whom were civilians, and remain the only uses of nuclear weapons in an armed conflict. Japan announced its surrender to the Allies on 15 August, six days after the bombing of Nagasaki and the Soviet Union's declaration of war against Japan and invasion of Manchuria. The Japanese government signed an instrument of surrender on 2 September, ending WWII.

Cold War Era

In 1990, on the heels of the Cold War, the United States possessed the world's second largest chemical weapons arsenal after Russia, consisting of more than 31,500 U.S. tons of lethal chemical agents and munitions.

Following years of bilateral talks with Russia and multilateral negotiations in the Conference on Disarmament in Geneva on chemical weapons disarmament, the United States decided in 1986 to take unilateral action to begin the destruction of its chemical weapons stockpile. The demilitarization effort was prompted by Congressional legislation calling for the safe destruction of the United States' stockpile of nonbinary lethal chemical agents and related facilities.

Since transport of chemical weapons was highly contentious - and was later outright banned by Congress in 1994 the U.S. Army's chemical weapons destruction plan relied on destruction facilities located at the nine U.S. chemical weapons depots in Anniston, Alabama; Pine Bluff, Arkansas; Pueblo, Colorado; Newport, Indiana; Richmond, Kentucky; Edgewood, Maryland; Umatilla, Oregon; Tooele, Utah; and Johnston Atoll. Destruction efforts began at the first destruction facility, Johnston Atoll, in 1990.

Figure 2: WWI Chemical Agent Production at Select U.S. Facilities

Facilities	Agent	Production (tons)
Willoughby, OH	Lewisite	150
Edgewood Arsenal, MD	Mustard	711
Edgewood Arsenal, MD & other locations	Phosgene	1,616

By 1997, when the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction (also known as the Chemical Weapons Convention or the CWC) entered into force, the United States had destroyed only 1,434 MTs of its chemical agents and munitions. As a member state of the CWC, the United States committed to the destruction of its remaining chemical weapons inventory.

Iran-Iraq War

Chemical weapons employed by Saddam Hussein killed and injured numerous Iranians and Iraqi Kurds. According to Iraqi documents, assistance in developing chemical weapons was obtained from firms in many countries, including the United States, West Germany, the Netherlands, the United Kingdom, and France.

About 100,000 Iranian soldiers were victims of Iraq's chemical attacks. Many were hit by mustard gas. The official estimate does not include the civilian population contaminated in bordering towns or the children and relatives of veterans, many of whom have developed blood, lung and skin complications, according to the Organization for Veterans. Nerve gas

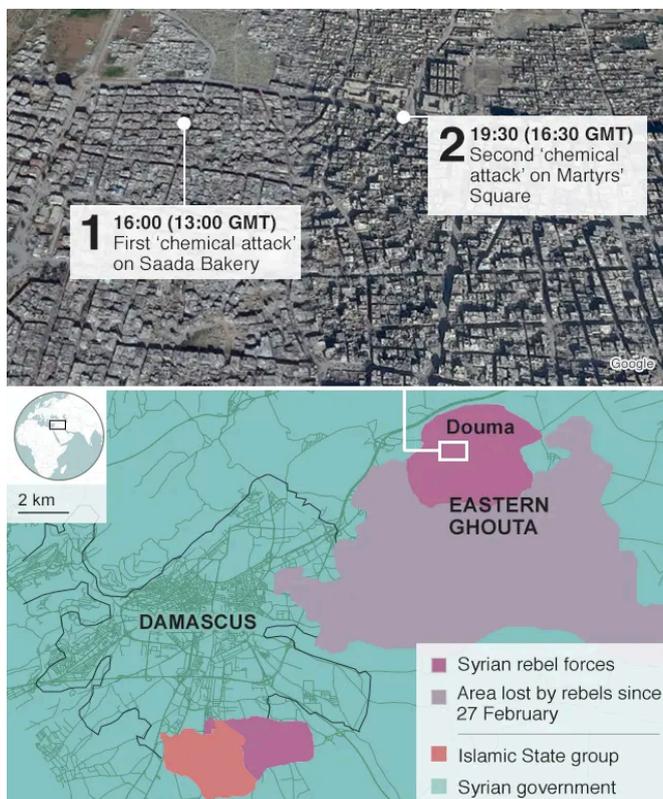
agents killed about 20,000 Iranian soldiers immediately, according to official reports. Of the 80,000 survivors, some 5,000 seek medical treatment regularly and about 1,000 are still hospitalized with severe, chronic conditions.

5.4. 21st Century

In the 21st century, chemical weapons use has reappeared in a few distinct patterns rather than as mass battlefield stockpiles like in World War I. The clearest concentration is Syria which explained detailly in another page (7.2), where investigations have repeatedly documented the use of toxic chemicals during the civil war, including confirmed exposure to sarin in the Khan Shaykhun incident and findings that attribute a 2018 Douma attack to perpetrators linked to Syrian state forces. Another major shift has been the demonstrated capability of non-state actors to deploy chemical agents: international investigations have concluded that the Islamic State used sulfur mustard in Syria, showing that chemical warfare is not limited to governments. A different, highly political form of use has also emerged through targeted poisonings with nerve agents, highlighted by the 2018 Salisbury incident in the United Kingdom, which triggered international technical assistance and verification work.

Taken together, the century's cases show chemical weapons being used as tools of terror, coercion, and intimidation in conflicts and political operations, with international attention focusing on attribution, verification, and accountability.

5.5. 2018 Douma Attack



In February, forces loyal to President Bashar al-Assad launched an assault on the Eastern Ghouta that reportedly left more than 1,700 civilians dead.

In March, troops split the region into three pockets - the largest of which was around Douma, home to between 80,000 and 150,000 people. Facing defeat, rebel groups in the other two pockets agreed to be evacuated to northern Syria.

But the group controlling Douma, Jaysh al-Islam, continued to hold out. On 6 April, after negotiations with the government stalled, air strikes resumed.

The bombardment continued for a second day, with dozens of people reportedly killed or injured by conventional munitions before the suspected chemical attack.

Activists from the Violations Documentation Center (VDC), which records alleged violations of international law in Syria, reported two separate incidents of bombs believed to contain toxic substances being dropped by the Syrian Air Force.

The Organisation for the Prohibition of Chemical Weapons (OPCW) says initial tests on samples from two sites detected "[various chlorinated organic chemicals](#)", along with explosive residues. However, no nerve agents were detected.

The Syrian government denies ever using chemical weapons, and its ally Russia says it has evidence that the incident was staged with the help of the UK.

Official news by OPCW:

<https://www.opcw.org/media-centre/news/2023/01/opcw-releases-third-report-investigation-and-identification-team>

6. Key Terms and Major Agreements

6.1. Chemical Weapons Convention (CWC)



CWC is a major arms control treaty administered by the Organisation for the Prohibition of Chemical Weapons (OPCW), an intergovernmental organization based in The Hague, Netherlands. The treaty entered into force on 29 April 1997. It prohibits the use of chemical weapons, and the large-scale development, production, stockpiling, or transfer of chemical weapons or their

precursors, except for very limited purposes.

The Convention aims to eliminate an entire category of weapons of mass destruction by prohibiting the development, production, acquisition, stockpiling, retention, transfer or use of chemical weapons by States Parties. States Parties, in turn, must take the steps necessary to enforce that prohibition in respect of persons within their jurisdiction.

All States Parties have agreed to chemically disarm by destroying any stockpiles of chemical weapons they may hold and any facilities which produced them, as well as any chemical weapons they abandoned on the territory of other States Parties in the past. States Parties have also agreed to create a verification regime for certain toxic chemicals and their precursors in order to ensure that such chemicals are only used for purposes not prohibited under the Convention.

6.2. Weapons of Mass Destruction (WMD)

In 1948, the United Nations defined weapons of mass destruction as:

“atomic explosive weapons, radioactive material weapons, lethal chemical and biological weapons, and any weapons developed in the future which have characteristics comparable in destructive effect to those of the atomic bomb or other weapons mentioned above.”

With the reference to future weapons, delegates of U.N. members recognized that new highly destructive weapons could emerge. Over time, the international arms control regimes identified non-lethal chemical and biological weapons as being “WMD.” Debate continues as to the possible inclusion of certain central nervous system agents and emerging infectious diseases as WMD.

Today, some emerging weapons may also warrant being considered as WMD. An out-of-control cyber weapon, for example, may spread throughout the globe, damaging industrial systems. Nanotechnology aerosols may effectively serve as novel chemical weapons beyond the bounds of existing normative and treaty limitations, and armed, autonomous drone swarms marry mass harm with brittle, easily-fooled AI. Debate is needed on which, if any, of these weapons should be included alongside traditional WMD, and about the degree to which existing non- and counter-proliferation mechanisms are useful in mitigating the risks these new weapons present.

Weapons of mass destruction and variations of the term “chemical, biological, radiological, and nuclear weapons,” do not appear capable of accommodating emerging technology risks. There is also a real debate to be had about whether the term remains useful in describing 21st century challenges, or whether alternatives or supplements such as “weapons of mass effect,” “weapons of mass agility,” or “weapons of mass disruption” might be more appropriate.

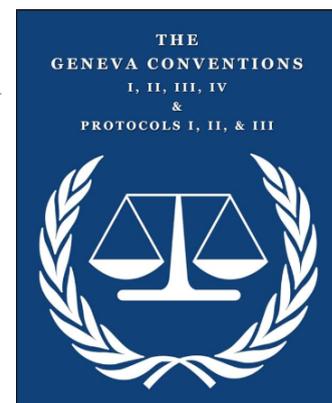
For the future consequences and possibilities, you can examine this website and the academic team highly requests:

[https://councilonstrategicrisks.org/wp-content/uploads/2021/04/Weapons-of-Mass-Agility_A-New-Threat-Framework-for-Mass-Effects-in-the-21st-Century BRIEFER-18_2021_05_03.pdf](https://councilonstrategicrisks.org/wp-content/uploads/2021/04/Weapons-of-Mass-Agility_A-New-Threat-Framework-for-Mass-Effects-in-the-21st-Century_BRIEFER-18_2021_05_03.pdf)

6.3. The Geneva Protocol

The Geneva Protocol of 1925 was drawn up and signed at the conference for the supervision of the international trade in arms and ammunition, which was held in Geneva under the auspices of the [League of Nations](#) from 4 May to 17 June 1925. The conference adopted a convention for the supervision of the international trade in arms, munitions and implements of war which has not entered into force and, as a separate document, a protocol on the use of gases. The earlier treaties prohibiting the use of gases to which the protocol refers are in particular the Hague Declaration concerning asphyxiating gases of 29 July 1899 and the Treaty of Versailles of 28 June 1919 as well as the other peace treaties of 1919.

The Geneva Conventions are at the core of international humanitarian law, the body of international law that regulates the conduct of armed conflict and seeks to limit its effects.



They specifically protect people who are not taking part in the hostilities, including civilians, health workers and aid workers, and those who are no longer participating, such as wounded, sick and shipwrecked soldiers and prisoners of war.



The Geneva Protocol responded to the widespread use of poison gas in World War I by prohibiting, in war, [asphyxiating, poisonous or other gases](#) and “bacteriological methods of warfare,” and by calling for this prohibition to be universally accepted as a part of International Law. It entered into force in the interwar period which was

mentioned in other parts of the guide and was deposited with the Government of France, establishing a durable international norm that the battlefield use of chemical and biological weapons is unacceptable. At the same time, the Protocol focused on use rather than possession, which meant many States maintained capabilities while pledging not to employ them, often alongside reservations tied to retaliation. Its long-term importance lies in setting the foundational legal and moral stigma against chemical warfare and providing a reference point later reinforced by more comprehensive regimes, including the global ban and verification system built under the Chemical Weapons Convention.

For a general video of explanation:

 [What are the 4 Geneva Conventions? | The Laws of War | ICRC](#)

6.4. Global Chemists’ Code of Ethics (GCCE)



Chemical research has made a significant positive impact in the world around us. However, aspects of such beneficial discoveries can also be used for negative purposes, which have led to the use of the term “dual use” to describe such research. Due to this fact, scientists have two enduring challenges: become and remain aware of the dual use potential of their work and become and remain responsible for the dual use research of concern that they themselves and their colleague’s conduct. Guided by The Hague Ethical Guidelines and Code of Conduct Toolkit, the Global Chemists’ Code of Ethics (GCCE) encourages global chemistry enterprises to adopt internationally recognised practices for chemical safety and security as well as compliance with national arms control and non-proliferation commitments. In particular, the GCCE outlines a process by which scientists and their institutions can define, detect and discourage misconduct in their field and deter questionable research practices.

Chemical research has delivered major benefits to society, yet the same knowledge, materials, and facilities can also be misused, which is why many official ethics and arms-control documents describe chemistry as a “dual-use” domain. Under the Chemical

Weapons Convention, States Parties must prohibit chemical weapons and enforce that prohibition for persons and entities under their jurisdiction, while also recognizing the right to conduct chemical research and use chemicals for purposes not prohibited by the Convention. Within this framework, the OPCW's Hague Ethical Guidelines set out that achievements in chemistry should be used to benefit humankind and the environment, and they stress accountability by calling on practitioners to protect chemicals, equipment, and facilities against theft and diversion, to follow applicable laws and regulations, and to report misuse to relevant authorities. The Global Chemists' Code of Ethics, developed with reference to these guidelines and related code-of-conduct tools, emphasizes responsible scientific conduct, including integrity and transparency in research, and the practical expectation that chemical practitioners and their organizations build and maintain strong safety and security culture through training, oversight, and regular review of protective measures for laboratories, industrial sites, and the wider supply chain.

The main document of GCCE:

<https://dchas.org/wp-content/uploads/2019/09/03-Brown-Global-Chemists-Code-of-Ethics.pdf>

6.5. Definition and Classification of War Crimes

War crimes are serious violations of the rules of customary and treaty law concerning international humanitarian law, criminal offenses for which there is individual responsibility. Colloquial definitions of war crime include violations of established protections of the laws of war, but also include failures to adhere to norms of procedure and rules of battle, such as attacking those displaying a peaceful flag of truce, or using that same flag as a ruse to mount an attack on enemy troops. The use of chemical and biological weapons in warfare are also prohibited by numerous chemical arms control agreements and the Biological Weapons Convention. Wearing enemy uniforms or civilian clothes to infiltrate enemy lines for espionage or sabotage missions is a legitimate ruse of war, though fighting in combat or assassinating individuals behind enemy lines while so disguised is not, as it constitutes unlawful perfidy. The rule of war, also known as the Law of Armed Conflict, permits belligerents to engage in combat. A war crime occurs when superfluous injury or unnecessary suffering is inflicted upon an enemy. War crimes also include such acts as mistreatment of prisoners of war or civilians. War crimes are sometimes part of instances of mass murder and genocide though these crimes are more broadly covered under international humanitarian law described as crimes against humanity. In 2008, the U.N. Security Council adopted Resolution 1820, which noted that "rape and other forms of sexual violence can constitute war crimes, crimes against humanity or a constitutive act with respect to genocide"; see also wartime sexual violence.

You can check the [Elements of Crimes](#) specifically, it is more detailed than we expect you to have a knowledge about so it's your choice to examine.

We highly request you to watch this video if you struggle to embrace the protocol of war crimes in chemical weapon usage: <https://www.youtube.com/watch?v=Mdj-AytrQ7U>

6.6. The Hague Ethical Guidelines

The [IUPAC Bureau](#) and Executive Committee have approved a request from the Organization for the Prohibition of Chemical Weapons, OPCW, to endorse and promote the Hague Ethical Guidelines.

The Hague Ethical Guidelines are intended to serve as elements for ethical codes and discussion points for ethical issues related to the practice of chemistry under the Chemical Weapons Convention. The core element of the guidelines, which is based on the premise that “achievements in the field of chemistry should be used to benefit humankind and the environment,” is fully consistent with IUPAC’s strategic mission and vision.

In 2015, a group of chemical practitioners from around the world, including several chemists with experience as volunteers in IUPAC, met in The Hague to formulate this set of ethical guidelines.

IUPAC has partnered with the OPCW on several important initiatives, including conferences on the impact of scientific developments on the Chemical Weapons Convention, on materials for education and outreach on dual uses of chemicals, and on preparation of the Guidelines. Additionally, a recent IUPAC project on recommendations for codes of conduct for chemists follows a similar model for promulgation of codes, encouraging its members to consider the guidelines in updating and preparing codes of conduct for their organizations. IUPAC encourages all of its member National Adhering Organizations, Associated Organizations, Company Associates, volunteers, fellows and affiliates to take note of the Hague Ethical Guidelines and IUPAC’s guidelines in their daily work and in the review and preparation of codes of conduct and guidelines for their home institutions and organizations.

Professionally explanation: <https://www.youtube.com/watch?v=6MLNswZiXfY>

Original Guideline:

https://www.opcw.org/sites/default/files/documents/PDF/The_Hague_Ethical_Guidelines.pdf
https://documents.unoda.org/wp-content/uploads/2021/04/OPCW5_The-Hague-Ethical-Guidelines.pdf

6.7. The Chemical Professional’s Code of Conduct

The American Chemical Society expects its members to adhere to the highest ethical and safety standards. Indeed, the [Federal Charter of the Society \(1937\)](#) explicitly lists among its objectives “the improvement of the qualifications and usefulness of chemists through high standards of professional ethics, education and attainments”. The chemical professional endeavors to advance the broader chemistry enterprise and its practitioners for the benefit of Earth and its people, and has obligations to the public, to colleagues, and to science.

ARTICLES

- Chemical professionals should seek to advance chemical science while striving for the highest standards of scientific integrity. This includes sharing ideas and information, keeping accurate and complete records, and giving due credit to the contributions of others. Undisclosed conflicts of interest and scientific misconduct, including fabrication, falsification, and plagiarism, are incompatible with this code.
- Chemical professionals should be aware of laws and regulations related to the professional conduct of science to ensure that their profession is practiced safely and appropriately.
- Chemical professionals should be actively concerned with the health and safety of co-workers, consumers, and the community. Professionals have a responsibility to serve the public interest and to further advance scientific knowledge. This includes ensuring that public comments are made with care and accuracy to avoid unsubstantiated, exaggerated, or premature statements.
- Chemical professionals should treat others with respect and will not engage in discrimination, harassment, bullying, dishonesty, fraud, misrepresentation, coercive manipulation, censorship, or other misconduct. Such actions apply to all professional, research, and learning environments, regardless of whether or not the action alters the content, veracity, or meaning of research findings, and regardless of whether or not the action affects the planning, conduct, reporting, or application of science.
- Chemical professionals should take responsibility to act or intercede where possible to prevent misconduct. This includes reporting suspected research misconduct, as well as any discrimination, harassment, bullying, dishonesty, fraud, misrepresentation, coercive manipulation, or censorship.
- Chemical professionals should be mindful of Implicit Bias and Unconscious Bias and strive to avoid all biases based on race, gender, age, religion, ethnicity, nationality, sexual orientation, gender expression, gender identity, presence of disabilities, educational background, or other personal attributes.
- Chemical professionals should strive to do their work in ways that are safe and sustainable for the environment. This includes continuing to work to develop sustainable products and processes that protect the health, safety, and prosperity of future generations.
- Chemical professionals should serve clients faithfully and incorruptibly, respect confidentiality, advise honestly, and charge fairly. Additionally, they should promote and protect the legitimate interests of their employers, comply with safety policies and procedures, fulfill obligations, and safeguard proprietary and confidential business information.
- Chemical professionals should strive for continual professional growth both personally and more broadly in the tutelage of others as a trust conferred by society. Professionals have a responsibility to understand limitations of their knowledge, remain current with developments in their field, learn with and encourage others.

7. Usage of Chemical Weapons and Possible Threats for Today

7.1. Russo-Ukrainian War

“Despite being instrumental in negotiating the Chemical Weapons Convention, Russia is intensifying its weaponisation and use of riot control agents and industrial chemicals in Ukraine. These developments show that preventing the use and proliferation of chemical weapons remains an international concern.”

Incendiary weapons were used a number of times during the Russo-Ukrainian War. Russians were accused of using white phosphorus bombs multiple times; in the Battle of Kyiv and against Kramatorsk in March 2022, against dug-in defenders at the Azovstal steel plant in Mariupol in May 2022 and in Marinka over the 2022 Christmas holiday. White phosphorus is a toxic chemical, and exposure to vapors leads to long-term ailments of the body, up to permanent disfigurement and death through organ failure.

Ukraine has called on the international chemical weapons watchdog in The Hague to launch a probe into Russia’s alleged use of toxic munitions against Ukrainian forces. Kyiv’s July 8



appeal to the Organization for the Prohibition of Chemical Weapons (OPCW) comes amid increasing international alarm over reports of escalating Russian chemical weapons attacks in Ukraine. The United Kingdom has recently sanctioned Russian individuals and an organization for involvement in the transfer and use of chemical weapons in Ukraine. The new sanctions came shortly after German and Dutch intelligence services warned of Russia’s widespread use of banned chemical

weapons on the Ukrainian battlefield. These accusations are not new. The US first accused Russia of utilizing chloropicrin, a banned anti-riot agent first used by Germany during World War One, more than a year ago. However, with no significant costs imposed on the Kremlin in relation to these charges, it appears that Russia continues to expand the use of chemical weapons against Ukraine.

The Ukrainian defence ministry states that Russia has carried out more than 9,000 chemical weapons attacks on Ukrainian troops since the start of the large-scale invasion in 2022. According to Ukraine, at least three deaths can be directly attributed to exposure to chemical weapons.

Indirectly, Russia’s use of chemical weapons has led to far greater numbers of Ukrainian victims as it has forced many Ukrainian troops to break cover, allowing them to be killed using conventional weapons.

Further researches if you want to strengthen your knowledge:

▶ Russia's widespread chemical weapon attacks a sinister battlefield strategy

<https://www.iiss.org/online-analysis/online-analysis/2025/09/testing-the-waters-russias-use-of-banned-chemicals-in-ukraine/>

7.2. Terroristas

Over the last 15 years, the world has witnessed sustained use of these horrific weapons. They are being used in war, conflict and as tools of terror; for tactical gain and politically as a means of distraction and disinformation. For producing chemical weapons a chemist, a laboratory and some industrially available toxic chemicals are enough. Because of this chemical weapons are easy to produce so they offer unconventional advantages to Terrorists. That leads terrorists to use chemical weapons and make them kill indiscriminately and wreak economic chaos. Traditional chemical weapons can be used for different purposes, to achieve tactical effects or against individuals. Their use is being denied, along with a campaign of disinformation to challenge attribution. It is increasingly challenging for the United Nations to produce sufficiently robust evidence to assign responsibility.

A crucial example for terrorist attacks made by using chemical weapons was committed by Al-Qaeda. Al-Qaeda leaders have shown an interest in acquiring and employing chemical weapons, as indicated by experiments testing the use of hydrogen cyanide on animals in al-Qaeda camps in Afghanistan prior to the September 11 attacks on the United States in 2001. In addition to other documents showing ongoing research on chemical weapons, al-Qaeda planned and then aborted a chemical attack on the New York City subway system in 2005. Furthermore, al-Qaeda of Mesopotamia (also known as al-Qaeda in Iraq) initiated chlorine attacks in Iraq in 2007. It is believed by some Western analysts that al-Qaeda leaders would not hesitate to use any chemical, biological, radiological, or nuclear weapons that they might acquire. For example, Al-Qaeda of Mesopotamia openly issued a public invitation for Muslim chemists, biologists, and physicists to join their cause.

Unfortunately, a substantial amount of information on how to manufacture chemical weapons already exists in the public domain, particularly on the Internet, which is within reach of individuals and groups worldwide. With chemical weapon manufacturing informations and toxic chemicals needed to manufacture chemical weapons being easily accessible, it makes the usage of chemical weapons an appropriate choice for terrorists.

8. Questions to be Addressed (QTBA)

- 1. How can the OPCW further restrict access to chemical weapons and their critical precursor materials without limiting legitimate industrial and scientific use?
- 2. What additional measures can be taken to prevent terrorist organizations and non-state actors from acquiring or using chemical weapons or toxic industrial chemicals?
- 3. How should the ethical responsibilities and production or research authorities of chemists, government officials, and academic institutions be restructured in order to prevent the misuse of chemical knowledge and reduce the risks associated with dual-use research?
- 4. How can chemicals with the potential to be weaponized be more effectively monitored, regulated, and controlled throughout the global supply chain?
- 5. How can information sharing among States Parties be streamlined to improve early detection, attribution, and response to chemical weapons threats?
- 6. Are there chemical agents, technologies, or emerging substances that should be newly classified under chemical weapons regulations, and if so, on what criteria?
- 7. What role should non-governmental organizations (NGOs), scientific bodies, and civil society play in supporting chemical weapons prevention and compliance?
- 8. In the event of a confirmed or suspected misuse of chemical weapons, what immediate and long-term actions should the OPCW be authorized to take?

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