Research Report GA1
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GA1
(Disarmament and International Security)

“Further strengthening institutions and laws design to limit chemical weapons and their research especially regarding dual use technologies.“

What are chemical weapons?

Chemical weapons are weapons which are designed to cause intentional death or harm through their toxic properties. Munitions, devices and other equipment, specifically designed to develop weapons with toxic contest also fall under the definition of chemical weapons.
There are four main parts of chemical weapons.

1. Toxic chemicals which, depending on the chemical and their processing, can cause death, lead to temporary incapacitation or permanent harm to humans and animals.
2. Part of weapons are chemical reactors which may not be directly in the weapons itself but take part at any stage of production.
3. Munitions and devices specifically designed to inflict harm or cause death through the release of toxic chemicals, including mortars, artillery shells, missiles, bombs, mines or spray tanks.
4. Equipment specifically designed for use directly in connection with the employment of munitions and devices identified as chemical weapons.

Advances in dual use technology can be repurposed for weapons leading to new challenges as innovation often outpaces regulation. To address this, legal framework and effective monitoring are essential to ensure that scientific progress is safeguarded from misuse. Chemical weapons remain a serious threat to international peace and security despite previous efforts.

The development of chemical weapons

The use of chemical weapons started in World War I causing 100.000 casualties and by now nearly 1 million deaths. To prevent further deaths the League of Nations resolve the Geneva protocol which prohibited the use of chemical weapons. It however, did not prohibit the research, development and production of chemical weapons. The protocol did not limit the use of chemical weapons if the other party in a war did either not sign the protocol or did not posses any weapons. This is why it is still beneficial to research chemical weapons. During the cold war approximately 25 States boosted the production and research of these. However, after World War II chemical weapons tend to have been rarely used except for the 1980s in the Islamic Republic of Iran.

To fill the loophole which developed at the Geneva Protocol in 1925, the UN member states adopted the “Chemical Weapon Convention“ (CWC). It is the first disarmament agreement which aims for an elimination of weapons of mass destruction. Therefore, the production, development, acquisition, stockpiling, retention, transfer and use of chemical weapons is prohibited.

Definition of chemical weapons according to CWC
(for further information on the treaty you can read the full CWC)

According to article II of the Convention, chemical weapons means:

a) Toxic chemicals and their precursors, except where intended for purposes not prohibited under this Convention, as long as the types and quantities are consistent with such purposes;
b) Munitions and devices, specifically designed to cause death or other harm through the toxic properties of those toxic chemicals specified in subparagraph (a), which would be released as a result of the employment of such munitions and devices;
c) Any equipment specifically designed for use directly in connection with the employment of munitions and devices specified in subparagraph (b).

Opening for signature in Paris on January 13, 1993 and entered into force on April 29, 1997. The CWC was signed by every UN member state at that time except for the Democratic Peoples Republic of Korea, the Republic of South Sudan and the Arab Republic of Egypt which signed but did not ratify it. This was a big milestone as almost every country agreed to end the era of chemical weapons leading a step closer to a potential end of war crimes in the near future.

New development strategies for chemical weapons

Chemical weapons

With rapid advances in chemistry and synthetic biology the danger of an reembark rises. Chemicals such as chlorine or phosgene, which are being used for bleaching paper, can be easily repurposed for chemical weapons and have a corrosive effect on the human body. Furthermore, the CWC allows these chemicals to be used, if it it not for the direct purpose of chemical weapons. It however is nearly impossible to detect new production facilities if they run e.g. under the purpose of bleaching paper.

Synthetic biological weapons
(We will not debate about these type of weapons but it is useful to know about them)

This also applies to synthetic biology which allows micro organisms which can be easily produced in a small lab with ordinary lab instruments. Not only does it make the production of chemical weapons cheaper and efficient but they usually show major harm to the central nerve center of the human body.

Terror organizations and non-state actors

Another dangerous aspect is minorities such as terror organizations which often have civilians as targets. These organizations often tend to invest in cheaper weapons which still have a big effect and are easy to operate without special training. As previously mentioned, the goods to produce the weapons are common goods which makes it very difficult to spot new production facilities.
Over the past decades terror organizations from all over the world have managed to attack civilians with chemical weapons.

On March 20, 1995, the Japanese religious organization “Aum Shinrikyo“ perpetrated a terrorist attack by releasing sarin gas, a highly toxic nerve agent, in the Tokyo subway during morning rush hour. The attack caused 13 casualties and over 5,000 people injured. Thirty years later, victims are still suffering from the physical and psychological injuries of the attack.
Even graver incidents happened in Syria in the 2010s. The Assad-regime attacked civilians approximately 336 times during the war causing thousands of casualties and leaving thousands of people wounded and unhealed.
Another incident happened in 2018 when former Russian spy Sergei Skripal and his daughter Yulia almost died after being poisoned with Novichok nerve agent. Later British intelligence linked the attack back to the Russian military intelligence service.
A further incident with Novichok happened in 2020 when journalist Alexei Navalny, a journalist and opposition of the Russian government, was poisoned by a Russian doctor. He was then brought to a hospital in Berlin where the doctors traced the poison back to Russian military. It was the same type Sergei Scribal and his daughter were poisoned with.

Another major aspect is that terror organizations are unpredictable and can easily exploit their knowledge on how to develop chemical weapons. This can very quickly endanger the national security of every UN member state, especially nowadays where information is available to everyone and can spread within minutes around the globe. It also harms states with an instabile government and minorities which are often the worst off when it comes to a takeover of terrorism.
This is why it is very important to not only monitor terror organizations but also their actions online.

Legally binding treaties and organizations

Organisation for the prohibition of chemical weapons OPCW

With the entry into force of the CWC the Organisation for Prohibition of Chemical Weapons (OPCW) was formally established. The organization was established under the norms of the UN Charter, however works independently from the UN. The CWC still serves today as their “constitution“.
The main aims are to ensure the destruction of chemical weapons and the prevention of a re-emerge in every member state. The OPWC is mainly financed through the annual member contribution as well as voluntary contributions. In July 2023 the OPCW confirmed that 99.4% of the stockpiles have been destructed.

However, with new technology and rising geopolitical tension the production of chemical weapons has re-emerged.
There is proof that the Syrian Arabic Republic still possesses chemical weapons. The government joined the OPCW in 2013 under rising pressure from the Russian Federation and the United States of America and confirmed that 1,300 tons of chemical gas were destroyed. Chemical gas has been used in 2021 within inner political conflicts which is why the Syrian Arabic Republic has currently no vote right. In March 2025 the new government announced to destroy the last weapons. There however, is no report that the destruction has been completed.

The OPWC has an annual member fee which every member state is obliged to pay. Other projects are financed through denotations from Non-Governmental Organisation (NGO) and member states.

An example would be the European Union (EU) which invests in direct projects such as the destruction of chemical weapons and training.

United Nations Office for Disarmament Affairs (UNODA)

The UNODA is an office under the General Secretary wich aims to maintain human, national and international security through the regulation control and elimination of arms.
Therefore, they have worked out the “UNODA strategic plan 2021-2025“ to not only protect civilians but also smaller and less powerful states from major threats.

UNODA Strategic Plan 2021-2025

First, it is important to work together with UN member states as these are the ones in charge of the production and use of chemical weapons.
Besides new laws and guidelines it is also on the agenda to weaken the relationship of major military powers for the sake of limiting arms race to the greatest extent. The nuclear tension has increased, wich is not a chemical weapon itself, but is a serious thread to millions of civilians.
Furthermore, it motivates smaller states to start with new investments in military spending.
The UNODA points out that it is important to stop the research on technological advances with potential military applications.
This is crucial as technology in the military does not only mean that new areas with a lot of military potential has been discovered but automatically fuels the current global arms race.
Moreover, the threat for weaker states rises as less human labour is needed to destroy or take over new regions. One can see the threat in South East Asia where the Peoples Republic of China tries to gain more territorial power and is one of the major powers in technology and artificial intelligence.

UN Security Council (UNSC) Resolution 1540

In 2004 the UNSC affirms that the spread of nuclear, chemical and biological weapons, and their means of delivery (please note that delivery is defined as “missile, rockets and other unmanned system capable of delivering nuclear, chemical or biological weapons, that are specially designed for such use.“) threatens international peace and security.

In brief, the resolution addresses that states must not support non-state actors by any means which seek or acquire to use Weapons of Mass Destruction (WMD). The states must adopt and enforce laws which prohibits non-state actors the development, possession, transport or use of WMD. This includes attempts, assistance, or financing.
To detect dual use technology the states must establish mandatory controls. These include accounting WMD- related items, physical protection of sensitive material, boarder and law enforcement as well as export, transit and transshipment controls with harsh penalties for violation.

The UNSC also agreed to encourage states to implement the new proposals and request assistance if the states lacks resources of any kind. Furthermore, the states should include their industry and society in the transition process as many parts of economy is directly affected.

EU Strategy against the proliferation of weapons of mass destruction

The European Union faces a major threat to international peace and security due to rising break-throughs in science but also through rising power of terror organizations.
Terror organizations have managed to gain more power over the past decades. Not only because information spread quicker via the media but also because of easier to produce of toxic weapons with ordinary chemicals which one could order online. One main concern is the rise of power that terror organizations receive, which motivates weaker and politically unstable states to level-up with these organizations as shown in Iran/Iraq conflict.

To control potential raw material exports which could be used to manufacture chemical weapons, the EU has implemented export controls. They apply to chemicals but also to operation machines which are needed for their development. The EU wants to work closer with partners and logistic hubs across borders to minimize the export of raw materials. It has shown that export control arrangements have slowed down the production but did not put an end to it. They however are still effective as many raw materials are dual-use and the use-case does not need to be mentioned in export forms.

Another concern the EU bring up are countries with ballistic programs. Their software is used to calculate wind and its effect on the flying object as well as gravity. The main concern is that chemical contents which harm or even kill humans are not directly implied by the war party itself but is transported by drones, ballistic rackets or even by cruise missiles.

To prevent such outbreak the EU has launched a support system to support institutions which verify chemical weapon research, production and stockpiles.
The EU however, has also stressed the importance to verify and control these institutions to prevent corruption. They have also stated their full commitment for partners on their treaty such as the United States of America.
To support weaker and unstable states the EU want to engage in the problem solving of political conflicts, developing assistance and reducing poverty, all of which very often support and cause the outbreak of violent conflicts. In case diplomatic measures fail, the EU recall the UN Charter chapter VII and international law (Please take a look into Chapter 7).

Non legally binding groups and treaties

The Australia Group

The Australia Group (please check if your country is included) is an informal arrangement which aims to support exporting and transshipping countries to detect chemical and biological weapon proliferation. The group meets once a year and evaluates tactics and techniques to improve the detection but also to evaluate the data and perform additional research with the help of the member states intelligence services. The group is not legally binding and member states participate voluntarily with the aim to undermine the development of chemical weapons.

The Wassenaar Arrangement

The Wassenaar Agreement is the first mutual agreement with the aim to control potential chemical weapons exports and sensitive goods which could be in dual-used with technology.
The agreement entered into force in July 1996 with 33 member states (please check if your country is part of the agreement).
The participating states agree to implement national export controls to detect technological devices which either are used to develop chemical weapons or to operate them. To detect a potential patterns every member state must report every 6 months about weapons transfers.
Furthermore, it is very important to focus on risk areas and conflict zones for the maintenance of international peace and security.

Hague Code of Conduct (HCoC)

The HCoC is an acronym for the Hague Code of Conduct against Ballistic Missile Proliferation (HCoC). It is a widely subscribed multilateral instrument that aims at delegitimizing ballistic missile proliferation. The HCoC consists of a set of general principles, modest commitments, and limited confidence building measures.
The HCoC aims to contribute to the process of strengthening existing national and international security arrangements and disarmament and non-proliferation objectives and mechanisms.
Participants recognize a need to prevent and curb the proliferation of ballistic missile systems capable of delivering weapons of mass destruction, as well as the importance of strengthening, and gaining wider adherence to multilateral disarmament and non-proliferation mechanisms. To meet these objectives, participants try to exercise maximum possible restraint in the development, testing, and deployment of ballistic missiles capable of carrying weapons of mass destruction.

Further approaches

Norm of manufacturing machinery

Many NGOs as well as member states have proposed to unify manufacturing machines which can be dual used in the chemical industry but also for chemical weapons. Therefore, it is on the industrialized states to agree on one norm and only produce in compliance with this norm. Many engineering components are already normed but there are different ones.
When every product is normed one can establish a registration form which requires a license. That way the exporting state knows where the machines are going and they can not be retransformed as the suppliers are controlled by the state exports. With a license one would need, inspections could be easier and directly implemented.

Finance and its loopholes

Besides the previously mentioned export controls one can also spot questionable cashflows. The bank systems “Swift“ which operate transactions, usually shows the addresses of the bank accounts the money comes as well as the account the money goes to. If one has the information where non-state actors order their resources for raw materials it would make it easier to stop the supply.

This however is only partly possible as countries like Switzerland, Liechtenstein or Mauritius (just examples) have very low thresholds for opening a bank account and often do not run background checks of any kind, loophole well known by terror organizations.
Companies receive an order from an account in a developing country that complies with all regulations against chemical weapons and export the goods to the third country. However, since it is assumed that the company is based in a developing country that complies with all necessary standards, these orders do not appear suspicious. This is because many companies order raw materials from an industrialized country and have them processed in a developing country.
The same applies to the illegal arms trade, because no one questions a domestic transaction, even though the transaction was carried out by two foreign organizations.
This leaves only export and import controls to secure chemical weapons, which are not only very time-consuming but also costly.
To solve this problem, stricter conditions and background checks for opening bank accounts would be needed in all UN member states.

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