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Editorial

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In the absence of a vaccine, the COVID-19 threat continues to dominate 2020, there remains a strong need for strengthening cooperation and assistance among countries. With the Meeting of Experts scheduled to be held during 1-10 December, the present pandemic could be viewed as the catalyst for strengthening the Biological Weapons Convention.

In this edition of CBW Magazine, Tatanya Novossiolova and Malcolm Dando have highlighted through their article, 'Strengthening the Biological and Toxin Weapons Convention at the 9th Review Conference: Advancing Effective Action on Biological Security Education, Awareness, and Outreach,' the need for upholding the norms of biological prohibition.

Moreover, the threat of Coronavirus has by no means deterred the advances in chemical attacks. Ian Anthony, notes in his article 'The National Security Impact of Crimes Using Chemical Agents' the growing number of chemical attack cases and the limitations of law enforcement authorities. Rajorshi Roy echoes the same concern through his article 'Poisoning of Alexei Navalny: The Plot Thickens'. However, one cannot undermine the success of OPCW and the UN-led mission that was able to destroy the Syrian chemical stockpile in an exceptional exercise conducted in a hostile security situation. The same has been showcased by Lakshmi Priya in her article 'Use of Chemical Weapons in the Syrian Crisis.' This year the OPCW would also be conducting the 25th Conference of the States Parties (CSP) that oversees the implementation of the Chemical Weapons Convention, promotes the Convention's objectives, and reviews compliance with the treaty.

This issue also comprises other features like Book Review and Chemical and Biological News. With our readers' feedback, we wish to publish issues in the future that focus on a subject of particular concern. Contributions and feedback are welcome and can be addressed to: cbwmagazineeditor@gmail.com.

The National Security Impact of Crimes Using Chemical Agents

Dr. Ian Anthony

Dr Ian Anthony is Director of SIPRI's European Security Programme. He has published numerous books on issues related to arms control, disarmament and export control.

Summary

Chemical attacks are not normal crimes as they have important consequences for national and international security, but they are also crimes that law enforcement authorities are obliged to investigate and, if possible, resolve through national criminal procedures. Salisbury case highlights the complexity of an investigation. Although, there are now sufficient cases of attacks with chemical agents to justify a systematic response, however, there still remains a doubt whether that law enforcement authorities are prepared for criminal cases with national and international security implications.

On 20 August 2020, the political activist and anti-corruption campaigner Alexei Navalny was taken seriously ill on board an internal flight in Russia. Mr Navalny was flown from Russia to Germany on 22 August to receive specialist medical care. At the time of writing the cause of his illness is not confirmed, but German doctors treating Navalny report that he was probably poisoned.[1]

Asia and Europe have recent experiences of sophisticated chemical agents being used to carry out assassinations or assassination attempts: the VX nerve agent was used to kill North Korean leader Kim Jong Un's half-brother, Kim Jong Nam, at the Kuala Lumpur International Airport in Malaysia in 2017; and toxic chemicals were used to attack Sergei Skripal, a former Russian intelligence agent, in Salisbury, United Kingdom, in 2018.[2] This is not the first time that Mr Navalny has been the focus of, an alleged poisoning, in 2019 he filed a complaint with Russian federal investigators that he had been poisoned in police custody. In 2019 Bulgarian authorities re-opened a criminal investigation on learning that a Russian intelligence officer linked to the Skripal attack was in Bulgaria at the time of a 2015 poisoning in Sofia.[3]

Following the attack on Mr. Skripal, British authorities concluded that 'the Russian Federation was responsible for an attempted murder here in our country' which focused attention on state liability for criminal acts carried out on foreign territory.[4] Such attacks are not normal crimes because they have important consequences for national and international security, but they are also crimes that law enforcement authorities are obliged to investigate and, if possible, resolve through national criminal procedures.

The implications extend beyond the direct victim: the use of toxic chemicals in public spaces causes collateral damage and puts many people at risk, and multidisciplinary teams set up from various state agencies are required to work quickly to respond to these attacks. The decontamination operation in Salisbury took over a year to complete and the direct costs are estimated at USD 40 million. The government paid USD 17 million to compensate local businesses during the period when they were unable to operate, but the true indirect costs—for example, the number of tourists deterred from visiting the city after the attack—are certainly much higher.[5]

Heightened awareness of the disruption caused by, criminal use of toxic chemicals may have increased the risk of transnational mass impact terrorist attacks. The cost of decontamination in a small rural city in England like Salisbury would be magnified many times in a major international city. If a key location such as the main financial district was attacked, it would not be practical to close the area for more than 12 months.

Responding to an Attack

The best way to reduce risk is to prevent highly toxic chemicals from falling into the wrong hands, and effective chemical security and chemical safety are essential prerequisites for the modern chemical industry. However, it cannot be excluded that additional attacks on politically exposed individuals will occur on foreign soil in the future. Moreover, 'grey zone' attacks that are not easily classified as acts of war may occur in the context of heightened geopolitical competition or state support may be provided to transnational terrorist groups.

A forensic awareness should be encouraged in public health authorities, emergency services and the law enforcement community so that potential criminal intent behind an event is considered until the possibility can be disregarded.[6] Authorities need to be coordinated so that information about a suspicious incident can be communicated and the alarm can be raised for appropriate responders at the earliest moment.

Items that form part of an investigation must be safely decontaminated while preserving forensic evidence. Samples that could be evidence in a criminal trial must be transported to analytical laboratories while ensuring a secure chain of custody. However, authorities with different responsibilities must be able to work in a crime scene and an investigation must not interfere with work to reduce risks to public health.

The complexity of an investigation was illustrated in the Salisbury incident. Although a very small quantity of toxic chemical was used in the attack, 12 locations were identified in different parts of the city with varying degrees of contamination.[7] Security cameras are ubiquitous in UK cities, which allowed authorities to trace the movements of the most contaminated individuals. Had the victims of the attack died, and without the aid of security cameras, the task of finding contaminated locations would have been much more difficult.

The specialist military units tasked with decontamination were trained to decontaminate hard surfaces (mainly metal) to a level where vehicles could rejoin military operations. Decontaminating softer surfaces such as plastics, fabrics and wood was a new challenge, and disposal of all contaminated structures was not an acceptable (or affordable) option.[8]

The decontamination effort was guided by political decisions using the metric of no risk

to the public. However, zero-risk is unobtainable from a technical perspective or can only be achieved at a prohibitive cost. Senior political decision makers need to understand risk metrics and develop an appropriate public communication strategy. The European Union is currently sponsoring the development of *How Clean is Clean* standards and defined mass decontamination procedures. However, there is still a need to develop methodologies for designing a sampling plan and to assess the level of contamination against established risk criteria, including tools to assess residual risks of secondary exposure and acceptable levels of contamination.[9]

There is a growing recognition of the role that chemical forensic analysis can play in investigating crimes. The use of natural science in criminal justice is already essential, but alongside classical applications such as the analysis of DNA, fingerprints, ballistics or fibres, forensic science is expanding to see how analysing chemical, biological and radioactive substances can help identify their origin, method of manufacture and potential connections to criminal use. Forensic toxicology uses documented research techniques and methods, but recommended operational procedures still need to be agreed internationally for sample preparation, data analysis, reporting, quality control and proficiency tests.[10]

The nature of recent attacks means that the appropriate response could be political and diplomatic through international organizations such as the United Nations or the OPCW, or it could be through an international law enforcement cooperation framework such as the International Criminal Police Organization (INTERPOL). Data analysis and reporting must be able to prepare documents that national authorities can use to support their work in either of these international frameworks.

Concluding observations

There are now sufficient cases of attacks with chemical agents to justify a systematic response, but it is not clear that law enforcement authorities are prepared for criminal cases with national and international security implications.

How would the political and law enforcement dimensions of a case be harmonized? Who would be responsible for managing the legal aspects, and what bodies of law would apply? Who would investigate suspected cases and how are investigators trained? What specialized technical capacities are available to the authorities? If a criminal case led to prosecution, which court would have jurisdiction and which judges would preside? How would international cooperation be organized to bring a criminal case?

To promote effective response there is an urgent need to identify the elements of a national system for investigation and attribution, including certified methods for evidence collection and analysis. International organizations such as INTERPOL have a role to play in providing training and knowledge to national judicial and law enforcement authorities.

National plans need to be tested and further upgraded through a systematic programme of exercises to ensure that they would function as expected if faced with a real contingency. Where possible the exercises should use live agents and include scenarios involving cross-border cooperation.

Endnotes:

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Use of Chemical Weapons in Syria

Dr. Lakshmi Priya

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Summary

Syria acquired the capability to produce chemical weapons in order to counter Israel's chemical weapons program. It imported chemical weapon precursor and dual-use production equipment from other countries including Russia, China, India and North Korea. Bashar al Assad inherited a huge stockpile of chemical weapons with production, manufacturing, storage and research facilities scattered over Damascus, Homs, Hama, Latakia and Aleppo. In 2014 when ISIS took hold of more than 34 thousand square miles of territory in Syria and Iraq, some of the chemical weapons fell into their hands and Syria became a spectacle of chemical weapon war as the world watched with bated breath. OPCW and the UN-led mission destroyed the Syrian chemical stockpile in an exceptional exercise conducted in a hostile security situation with the use of GPS cameras.

Chemical agents, including Chlorine and Sarin, have been used in Syria more than 300 times since the beginning of the Arab Spring in 2011. The first major attack took place in Eastern Ghouta district claiming lives of 1,400 civilians on 21 August 2013 and since then other cities, namely Homs, Al-Ateiba, Khan al-Asl, Adra, Aleppo and Saraqeb, came under attack. Allegations were levelled against both the state as well as the non-state actors for the use of chemical weapons. It was the April 2017 attack in Khan Sheikhoun in Idlib province that resulted in 92 casualties that invoked strong reaction from the US President Donald Trump who ordered use of Tomahawk missiles on Al-Shayrat Syrian Air Base from the U.S. Navy ships in the Eastern Mediterranean Sea. However, this did not prevent the use chemical weapons as shown in the table below.

Table: Major Chemical Attacks in Syria

Location	Date	Deaths	Chemical agent
Eastern Ghouta, Damascus	21/8/2013	1400	Nerve Agent Sarin
Khan Sheikhoun Idlib	4/4/2017	92	Nerve Agent Sarin
Al Salaliyah,	12/12/2017	42	Nerve Agent Sarin
Jrouh, Hama	12/12/2017	25	Nerve Agent Sarin
Douma, Damascus	4/2018	43	Chlorine

Source: US Government Report, Government Assessment of the Syrian Government's Use of Chemical Weapons on August 21, 2013 Human Rights Watch, Death by Chemicals.

Chemical attacks in Syria have been perpetrated by the Syrian government as well as the non-state actors. According to a study conducted by the Global Public Policy Institute in February 2019, there were 336 cases of chemical attacks in Syria and around 98 percent of them were perpetrated by the Syrian government.[1] Even though US intelligence has been reiterating that Syria held a stockpile of the nerve agent Sarin since long, presence of chemical weapons stockpile was confirmed for the first time by the Syrian Foreign Ministry spokesman Jihad Makdissi in 2012.[2] The non-state actors got hold of the chemical agents when ISIS took hold of more than 34 thousand square miles of territory in Syria and Iraq in 2014.

The indiscriminate fatalities associated with chemical attacks evoked strong reactions from the international actors like UK and France. The two countries sent letters to the Secretary-General of the United Nations and called for investigations into the alleged incidents of the use of chemical weapons in Syria.[3] When Syrian government invited the United Nations to conduct an investigation of the 19 March 2013 attack in Aleppo, the UN Secretary-General Ban Ki-moon announced the investigation in conjunction with the World Health Organization (WHO) and the Organization for the Prohibition of Chemical Weapons (OPCW). In 2014, the OPCW Fact Finding Mission was established to confirm the use of chemical weapons in reported attacks and determine the types of weapons used for the same. A year later, the UN-OPCW Joint Investigative Mechanism was established with a mandate to investigate the responsible actors in instances of chemical weapons use in Syria.

On 14 October 2013 Syrian government joined the Chemical Weapons Convention (CWC) as a possessor state and declared arsenals including 1,000 metric tons of Category I chemical weapons, 290 tons of Category II chemicals, and 1,230 Category III unfilled delivery systems.[4] The UN-OPCW joint mission conducted the timely elimination of the chemical weapons program in a hostile security situation. The destruction of Syrian chemical stockpile by the joint UN-OPCW mission was an exceptional exercise conducted during an ongoing civil war in the country as the rules of the chemical weapons convention was constantly being modified. For the Syrian case special precaution was taken because of the raging civil war.

Firstly, the chemical weapons transport from the storage to the destruction facility was tracked physically even though permanent tagging of individual weapons with tamperproof devices is sufficient safety measure as per the Part IV A of the verification annex of the CWC. Second, instead of the CWC Executive Council, the Director General has the discretion over preventing frivolous and abusive challenge inspection by a state party in case of Syria. Third, Syria was not given the right to 'manage access' so as to protect confidential information unrelated to chemical weapons. Fourth, as per Article IV and V of the CWC the affected state has to bear the cost of destruction as well as verification; however, in this case, CWC invited state parties to consider voluntary contributions to established trust funds through decision EC-M-33/Dec 1. Lastly, since the UN-OPCW mission was unable to find a willing and able host for destruction of the chemical weapons, the destruction was performed at a floating platform in sea and the exercise was carried out with the help of Denmark, Norway, China, UK, Germany, USA and Russia in June 2014.[5]

After the elimination of the chemical weapons, the joint mission ceased to exist in

December 2017 as Russia vetoed its extension on grounds of unprofessional conduct, while the OPCW mission in Syria continues to deal with the destruction of chemical weapon production facilities. In June 2018 the OPCW got the mandate to assign blame for chemical attacks and it formed an Investigation and Identification Team tasked with finding the perpetrators of the use of chemical weapons in Syria. The team presented its first report in April 2020 ascertaining role of the Syrian Arab Air Force in the use of nerve gas Sarin and Chlorine in Ltamaneh in March 2017.[6] OPCW Director-General conveyed the Technical Secretariat's willingness to assist the Syrian Government in the fulfilment of these obligations under OPCW Executive Council decision EC-94/DEC.2 within the required 90-day period.[7] However, the team is currently investigating priority cases related to use of Chlorine barrel bombs in Al Tamanah (Idlib) and Kafr Zita (Hama) in April 2014, use of Sulfur Mustard artillery shells in Marea (Aleppo) in September 2015; and use of Chlorine in Saraqib (Idlib) and Douma (Damascus) in February and April 2018 respectively.[8]

There has not been any instance of the use of chemical weapons in Syria after the series of chemical attacks in Douma (Damascus) in April 2018. The period of lull could be attributed to the growing international pressure on the Assad government along with reduced capacity of the non-state actors due to destruction of the chemical weapons sites. The economic sanctions of the individuals as well as financial institutions designated by the Ceasar Act as well as the April 2020 OPCW report that hold the Syrian government accountable for the use of chlorine and Sarine in Ltamenah in March 2017 work as an impediment for the Syrian government. Nevertheless, the respite in the use of chemical weapons in Syria is promising but until Syria is rid of the chemical weapons stockpile, a relapse is possible.

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8 Gregory D. Koblentz (2019) "Chemical-weapon use in Syria: atrocities, attribution, and accountability", The Nonproliferation Review, 26:5-6, 575-598, DOI: 10.1080/10736700.2019.1718336 https://www.tandfonline.com/doi/full/10.1080/10736700.2019.1718336?scroll=top&needAccess=true accessed on 27 October 2020.

Poisoning of Alexei Navalny: The Plot Thickens

Rajorshi Roy

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Summary

Russia's high-profile opposition leader Alexei Navalny's poisoning has led to intense speculation about not only the perpetrator but also its timing and motive. Widely conflicting diagnosis emerging from Russia, where Navalny was first treated, to Germany, where he was airlifted for further medical treatment, have further fanned this speculation. Unsurprisingly, the needle of suspicion has fallen on the Russian government. The purported use of the lethal Novichok nerve agent is strikingly similar to the alleged Russian playbook of eliminating dissenters. The OPCW report has also raised more questions than answers, including a possible clandestine chemical weapons programme. Meanwhile, the Russian government has alleged the involvement of its adversaries in staging this assassination attempt. Circumstances indicate to there being more than what meets the eye. Given the stakes involved, will the real picture ever come out?

On 20 August 2020, Russia's most high-profile opposition leader Alexei Navalny fell virulently sick mid-flight while enroute to Moscow from Tomsk where he was campaigning for the forthcoming local elections. Placed in a medically induced coma in Omsk, where the flight made an emergency landing, he was soon airlifted to Berlin for further medical treatment once his condition deteriorated. After spending more than a month in the hospital, Navalny has now been discharged and is expected to make a full recovery.

Conflicting Diagnosis

Given the stature of Navalny in Russian politics, the speculation about his illness has deepened on account of the hugely conflicting reports emanating around his diagnosis. Russian medical experts who treated Navalny have blamed these series of events on his "metabolic disorder" which led to a "sharp drop in blood sugar".[1] They have ruled out any foul play while he was in Russia.[2]

On the other hand, Germany, which conducted its own tests including on Navalny's urine and blood samples apart from the water bottle that Navalny had used on the day of travel, has alleged poisoning through cholinesterase inhibitor.[3] This substance is part of the lethal Novichok nerve agent family. Germany's position has been corroborated by the International Organisation for the Prohibition of Chemical Weapons (OPCW).[4] The Organisation conducted its own tests based on technical assistance sought by Berlin.[5]

Therefore, if one goes by the German and OPCW diagnosis, Navalny was poisoned using a chemical weapon. Under the 1997 Chemical Weapons Convention (CWC), the

use of a nerve agent to poison is considered an act of using chemical weapons.[6] Given the sophistication needed to handle these agents, the European Union (EU) led by Germany has accused the Russian state[7] of being complicit in his poisoning. This has led to a fresh round of European sanctions on Russian individuals and the organisation[8] that the EU considers to be involved in the act.[9]

OPCW Report Raises More Questions Than It Answers

Interestingly, OPCW, the principal organisation responsible for implementing the CWC, in its report on Navalny highlighted his poisoning through "similar structural characteristics as the toxic chemicals that form part of the Annex on Chemicals to the Convention".[10] This Annex identifies the chemicals that the 193 countries which are signatories to CWC are prohibited from producing, storing, using and transferring except for scientific purposes, and that too with prior intimation to the OPCW. This report should, therefore, have concluded this seemingly open and shut case by identifying the poison and its source of origin. Instead, it throws up more questions than it answers. This includes the nature of the newly identified Novichok toxin as well as the timing and motive behind the poisoning.

Notably, the toxin is not yet banned by the CWC. This raises the prospects of a clandestine chemical weapons programme by a few countries. Moreover, the report not only fails to identify the origin of the poison but has also not revealed the biomarkers used in the attack.

The Needle of Suspicion on the Russian Government

Given the Soviet-sponsored invention of Novichok in the 1980s, the expertise needed to handle the potent toxin and the growing domestic popularity of Navalny, it is unsurprising that the needle of suspicion has fallen on the Russian state. The fact that the Russian government has been accused of adopting a similar *modus operandi* in eliminating high profile dissenters[11] and opposition leaders in the past, gives credence to this suspicion.

But herein the plot thickens. Given that the toxin remains embedded on to human enzyme for an extended period of time even post-mortem, the key question is why would Russia allow Navalny to be airlifted to Berlin considering that the toxin would inevitably show up in tests in Germany. Perhaps, he was sneaked out of the country although this seems highly improbable on account of the scrutiny that Navalny faces. The only evidence of this perceived clandestine operation is Navalny's statement that President Putin had forbidden him from leaving the country.[12]

Moreover, the elimination of Russia's most credible opposition leader would run the risk of galvanising the opposition especially at a time when discontentment about the government's handling of the COVID-19 pandemic has grown in magnitude. It could also have undermined Russia's claims of being a genuine democracy.

Also, there exist other methods of causing death instead of the present circumstances, which have only drawn attention once again to Novichok which the Russian government had been accused of previously using in the high profile poisoning of Sergei Skripal in 2018. This would re-paint Russia as not only continuing to engage in targeted killings but also a prolific proliferator of the CWC despite its global assurances of having eliminated its chemical weapons.[13] This would put Moscow in the crosshairs of international condemnation especially considering it was Russia itself which had recommended the

addition of new chemical formulae of the Novichok family to the updated Annex of the CWC in November 2019.[14]

These aforesaid instances of the undeniable fallout lend some credence to the Russian Foreign Ministry's allegation that the poisoning was "staged" by Moscow's "enemies".[15] Given Russia's ongoing confrontation with the West, it is not implausible that the poisoning was aimed at catalysing the growing instability in the Kremlin's neighbourhood. Also, it is pertinent to note that Russia does not have exclusive access to Novichok.

On the other end of this hypothesis, are a range of reasons that build a credible case of the Kremlin's approval, if not outright involvement. For instance, it is unthinkable that Navalny's poisoning, if it indeed did take place in Russia, could be the handiwork of anyone except Russian agencies. Navalny's growing popularity as well as his exposé of a cornucopia of corruption were bound to have unnerved key Russian power stakeholders. Eliminating him at this juncture would prevent him from riding the wave of festering discontentment and revealing more sordid corrupt practices. Perhaps, the perpetrators were hedging their bets that the lack of an alternative opposition leader of Navalny's stature would render the opposition rudderless. This has been borne out by the absence of any mass movement or protest in the aftermath of the August incident. Instead, a concerted campaign has been initiated to discredit Navalny, including branding him an "instrument of Russia's adversaries". In this context, the key issue worth pondering is why did doctors treating Navalny in Russia administer him atropine[16] – a substance used to tackle nerve agent poisoning, when they purportedly did not find any trace of the toxin. Perhaps, Russia's recommendation for the inclusion of the formulae of Novichok in the Annex of CWC could have been part of its strategy to deny culpability in any cases of future poisoning. Russia would also have likely factored in the lack of bite of any potential European sanctions which in any case today cover practically every aspect of their bilateral ties. Russia's veto power at the United Nations Security Council (UNSC) would also shield it from any punitive action, given the fact that the OPCW can only present the merits of a case before the UNSC for further action.

Given the stakes involved, it is unlikely that the real picture will ever come out. The perpetrators are likely to go scot free as well. But what appears certain is that history is likely to repeat itself in the future.

Endnotes:

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Nuclear, Chemical and Biological Weapons (NCBW) in India & Pakistan Equation: Past & Present

Ankit Kumar

Ankit Kumar is a New Delhi based strategic affairs analyst with a research focus on Nuclear Deterrence and International Security. He was earlier associated with New Delhi based Centre for Land Warfare Studies (CLAWS), the Observer Research Foundation (ORF), and the Ministry of External Affairs (MEA).

Summary

Relations between India and Pakistan have remained hostile, since partition, owing to varied geopolitical reasons. They both compete against each other in conventional and nuclear arms. While the threat of CBW remains low in the region, it cannot be completely ruled out. The existence of non-state actors also poses a credible threat to the inadvertent use of cheaply available chemical or biological weapons. It is therefore important to timely assess the past, present and future of NCBW between India and Pakistan.

Out of many factors that determine the stability of the South Asian region, nuclear, chemical and biological weapons dynamics play a major role in determining peace in the region. The reason for this stems out from the fact that the major players in the region, namely India and Pakistan, account for a sizable population. Both countries share one of the heaviest militarised borders in the world standing against each other all round the year irrespective of harsh terrain or extreme weather. Adding to that, turbulent past, domestic aspirations, alliances and new nexus have often fuelled competition amongst the major players in the region. Any chemical, biological or nuclear threat in the region will have disastrous consequences and its possible fallout is bound to have effects in its extended neighborhood due to geographical proximity.

The ongoing COVID crisis has alarmed the whole world about the disastrous consequences of a dangerous virus thus any risk pertaining to any Weapons of Mass Destruction must be taken with serious attention. South Asia is home to notorious non-state actors, particularly in the western part of South Asia. This not just poses a threat to the use of Nuclear, Chemical and Biological Weapons (NCBW), but also increases proliferation risks in the region. It is therefore essential to timely examine the past, present of NBC threats in the region.

Hostility and Race for Dominance

The rivalry between India and Pakistan dates back to the time of the bloody partition during 1947. As soon as the two countries grew, both developed their military capabilities partly through indigenous innovation as well as foreign assistance. While the military capabilities changed over time,

so did the threat perceptions of each other. Territorial loss of East Pakistan in the 1971 war with India was a major setback that had a profound impact on military strategy in Pakistan for years.[1] For India, the 1962 war with China blew prospects of peace in its northern borders. India undertook its first Peaceful Nuclear Explosion (PNE) in May 1974.[2] Pakistan followed India's suit and by the turn of the century, both India and Pakistan overtly came up as a Nuclear Weapons State (NWS). Since then, both countries continue to modernise their nuclear forces.

Post partition, both India and Pakistan became sufficiently equipped with the required infrastructure to develop chemical and biological weapons. Being 'poor man's choice of WMD', they were not as complicated as nuclear weapons in terms of manufacturing and its delivery. There existed perpetual worry in the west regarding the potential manufacture and use of Chemical and Biological Weapons (CBW). There was a fear that in order to upscale dominance and asymmetry against each other, the countries in the region could explore CBW options at a viable cost. However, despite having potential infrastructure, the two major countries in the region chose to proscribe the CBWs by signing international treaties. Both at the same time kept nuclear options open by not signing the Nuclear Nonproliferation Treaty (NPT) and refrained from signing any international treaty that could bind them from further exploring nuclear weapons. In 1992, both India and Pakistan signed a joint declaration on banning the production or even use of any chemical weapons.[3] In 1993, both countries signed the Chemical Weapons Convention (CWC) and ratified it in the following years. The two countries are also party to the Biological and Toxin Weapons Convention (BTWC). Notwithstanding adherence to international conventions and treaties banning the use of CBWs, both countries have accused each other of potentially developing such capabilities. Several assessments from the west have also deliberated such potential developments of CBW capabilities but none of the countries have confirmed any such reports.

A recent revelation by Klaxon Group alleges that Pakistan and China recently entered a covert agreement to expand bio-warfare capabilities.[4] The report suggests that China's interest in a secret deal lies in expanding the testing of biological agents outside its soil as well as keeping India engaged with Pakistan if needed. Central to this allegation is China's infamous bio lab, Wuhan Institute of Virology. As per the report, the institute is responsible for providing logistical as well as financial support. Both China and Pakistan denied such allegations however, the report comes at a time when China is being held responsible by numerous countries for not appropriately handling the COVID-19 in its initial phases.

Developments and Trends in Chemical and Biological Weapons

At present, India and Pakistan have played active roles in international conventions related to Chemical and Biological Weapons. Biotech industries both in India and Pakistan have significantly developed over recent years with the establishment of new biotechnology institutions and pharmaceutical industries. Prominent institutions in Pakistan include the National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Nuclear Institute for Agriculture and Biology (NIAB) and Dr. A.Q. Khan Research Laboratories, Islamabad. India's institutions include the National Institute of Immunology (NII), National Brain Research Centre (NBRC) and

National Centre for Plant Genome Research (NCPGR), New Delhi.

Pakistan emphasises robust control on institutions and industries, analysts do note concern over the threat of accidental proliferation or use of dual-use technology by non-state actors. India too has a decent industrial and institutional base in both biotechnology and pharmaceuticals.

As far as Chemical Weapons are concerned, both India and Pakistan play an active role in the Organisation for the Prohibition of Chemical Weapons (OPCW) and adhere to periodic inspections. Adhering to the OPCW guidelines, India has completely dismantled its chemical weapons program.[5] While the major players in the region have officially adhered to not use CBW's, several nuclear doctrines like that of India considers the use of CBW as crossing the nuclear threshold. In 2003, India revised its nuclear doctrine and added that the use of CBW against India will give it a right to use nuclear weapons.[6] This not just added a deterrent against the use of CBW's but has linked CBW security to nuclear security in the region.

Conclusion

The use of CBW's offer lesser incentives and more risks. While the risk of CBW lies between low to moderate, risks of nuclear weapons have never been low. South Asia has been the fastest- growing nuclear weapons region. Pakistan at present has heavily invested in nuclear weapons.

As compared to the other forms of WMD, the threat of CBWs in the region remains relatively very less. While there exist enough infrastructural capabilities for the development of CBWs, there is less evidence to suggest a concrete threat of CBW. Heavy population density and geographic proximity to each other offer less incentive for a country to pursue an offensive chemical or biological weapons program. The possible use can have disastrous fall out impacting all equally. Major stakeholders in the region are party to various international treaties and conventions, making them bound to abide by international guidelines. While the use of CBWs doesn't fit into the strategic paradigm of any rational actors in the international system. Yet the threat of notorious use by non-state actors should not be ruled out. In order to prevent any inadvertent use, periodic inspections, commitments to the spirit of international treaties and international guidelines for physical safety is a must.

Endnotes:

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3 "Chemical Weapons - India Nuclear Forces". 2020. Fas.Org. Accessed October 12. https://fas.org/nuke/guide/india/cw/

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Strengthening the Biological and Toxin Weapons Convention at the 9th Review Conference: Advancing Effective Action on Biological Security Education, Awareness, and Outreach

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Summary

Today, there is an urgent need for reconciling the benefits that are likely to be accrued from the continuous advancement of the life sciences with the potential risks arising from the availability, accessibility, and affordability of the knowledge, tools, and technologies necessary for conducting scientific work. Within the context of the BTWC, biological security education and awareness are considered essential to strengthening the full and effective implementation of the Convention. The paper reviews the proceedings of the Meetings of Experts in 2018 and 2019 and the Meetings of States Parties in 2017, 2018, and 2019, to identify practical options for promoting effective action on enhancing biological security education, awareness-raising, and outreach at the 9th Review Conference of the BTWC.

1. Introduction

The progress of biotechnology over the past few decades promises to make a significant contribution to health, socio-economic development, and environmental protection. At the same time, the global diffusion of cutting-edge life science capabilities with multiple adaptive uses increases the risk of accidental and deliberate misuse of life science knowledge and materials against humans, animals, or plants. Thus, there is an urgent need for reconciling the benefits that are likely to be accrued from the continuous advancement of the life sciences with the potential risks arising from the availability, accessibility, and affordability of the knowledge, tools, and technologies necessary for conducting scientific work. This requires the implementation of an integrated and comprehensive approach of complementary and mutually reinforcing elements which seek to guarantee that the life sciences are used only for peaceful, prophylactic, and protective purposes. It is helpful to think of this required approach as a systematically organised 'web of prevention' which integrates both the efforts to prevent the unintentional (accidental) release of biological agents and toxins, including naturally occurring diseases (biosafety) and the efforts to prevent the deliberate release of biological agents and toxins (biosecurity) into a coherent policy and regulatory framework.[1] The value of the web of prevention has been recognized by the States Parties to the Biological and Toxin Weapons Convention (BTWC), the principal international agreement that prohibits the development, stockpiling, acquisition, and retention of biological weapons. The Fifth Review Conference of the BTWC held in 2002 agreed an Inter-Sessional Programme of Work to discuss and promote common

understanding and effective action on the following topics:

i. the adoption of necessary national measures to implement the prohibitions set forth in the Convention, including the enactment of penal legislation;

ii. national mechanisms to establish and maintain the security and oversight of pathogenic microorganisms and toxins;

iii. enhancing international capabilities for responding to, investigating and mitigating the effects of cases of alleged use of biological or toxin weapons or suspicious outbreaks of disease;

iv. strengthening and broadening national and international institutional efforts and existing mechanisms for the surveillance, detection, diagnosis and combating of infectious diseases affecting humans, animals, and plants;

v. the content, promulgation, and adoption of codes of conduct for scientists.[2]

Since 2002, BTWC States Parties have held annual meetings preceded by meetings of experts as part of an Intersessional Process intended to inform States Parties' considerations as regards the strengthening of the Convention. The current Intersessional Programme, 2018-2020 focuses on sets of issues under five headings in Meetings of Experts each summer and Meetings of States Parties later each year. These headings are:

MX1: Cooperation and assistance with a particular focus on strengthening cooperation and assistance under Article X.

MX2: Review of developments in the field of science and technology related to the Convention.

MX3: Strengthening national implementation.

MX4: Assistance, response and preparedness.

MX5: Institutional strengthening of the Convention.

The Eight Review Conference of the BTWC in 2016, when considering Article IV on the national implementation of the Convention noted the value of national implementation measures to:

"(a) *implement voluntary management standards on biosafety and biosecurity;*

(b) encourage the consideration of the development of appropriate arrangements to promote awareness among relevant professionals in the private and public sectors and throughout relevant scientific and administrative activities;

(c) promote amongst those working in the biological sciences awareness of the obligations of States Parties under the Convention, as well as relevant national legislation and guidelines;

(d) promote the development of training and education programmes for those granted access to biological agents and toxins relevant to the Convention and for those with the knowledge or capacity to modify such agents and toxins;

(e) encourage the promotion of a culture of responsibility amongst relevant national professionals and the voluntary development, adoption and promulgation of codes of conduct;

(f) strengthen methods and capacities for surveillance and detection of outbreaks of disease at the national, regional and international levels, noting that the International Health Regulations (2005) are important for building capacity to prevent, protect against, control and respond to the international spread of disease; and

(g) prevent anyone from developing, producing, stockpiling, or otherwise acquiring or retaining, transporting or transferring and using under any circumstances, biological agents and toxins, equipment, or their means of delivery for non-peaceful purposes".[3]

When considering Article VII of the Convention on international assistance in case of alleged use of biological weapons, the Eighth Review Conference recognized:

"capacity building at the national and international levels as the most immediate imperative for enhancing and strengthening the capacity of the States Parties to promptly and effectively detect and respond to the alleged use or threat of use of biological weapons."[4]

The Conference also noted that:

"the International Health Regulations (2005) are important for building capacity to prevent, protect against, control and respond to the international spread of disease; such aims are compatible with the objectives of the Convention".

When considering Article X of the Convention on international cooperation and assistance, the Eighth Review Conference agreed on the value of:

"working together to promote capacity building in the fields of vaccine and drug production, disease surveillance, detection, diagnosis, and containment of infectious diseases as well as biological risk management. The Conference affirms that building such capacity would directly support the achievement of the objectives of the Convention."[5]

The Conference further:

"(a) encourages the States Parties to continue strengthening existing international organizations and networks working on infectious diseases, in particular those of the WHO, FAO, OIE and IPPC, within their respective mandates;

(b) notes that the role of these organizations is limited to the epidemiological and public/animal/plant health aspects of any disease outbreak, but recognises the added value of information exchange with them;

(c) encourages States Parties to improve communication on disease surveillance at all levels, including between States Parties and with the WHO, FAO, OIE and IPPC;

(d) calls upon States Parties to continue establishing and/or improving national and regional capabilities to survey, detect, diagnose and combat infectious diseases as well as other possible biological threats and integrate these efforts into national and/or regional emergency and disaster management plans;

(e) *urges States Parties in a position to do so to continue supporting, directly as well as through international organizations, capacity-building in States Parties in need of assistance in the fields of disease surveillance, detection, diagnosis and combating of*

infectious diseases and related research".

It is thus evident that the topics that are being considered under the Meetings of Experts are underpinned by a common understanding among BTWC States Parties that biosafety and biosecurity efforts are mutually reinforcing for ensuring that the life sciences are not misused for hostile purposes. It is also evident that promoting biological security education and awareness, including as part of capacity building for preventing and countering deliberate disease outbreaks is essential to strengthening the full and effective implementation of the Convention. This paper advances the argument that upholding the norm of biological prohibition requires the systematic and integrated consolidation of biological security education, awareness-raising, and outreach efforts within the framework of the BTWC. The paper reviews the proceedings of the Meetings of Experts in 2018 and 2019 and the Meetings of States Parties in 2017, 2018, and 2019, in order to examine how the issue of biological security education, awareness-raising, and outreach has been addressed by BTWC States Parties and identify practical options for promoting effective action on enhancing biological security education, awareness-raising, and outreach at the Ninth Review Conference of the BTWC.

2. BTWC Intersessional Programme, 2018-2020

The purpose of this section is to examine how the issue of biological security education, awareness, and outreach has been addressed in the proceedings of the current BTWC Intersessional Process, 2018-2020. To this end, relevant Working Papers submitted by States Parties, as well as the Chairs' summaries of the Meetings of Experts in 2018 and 2019 are reviewed.

2.1 2017 Meeting of the States Parties (MSP)

The final report of the 2017 MSP sets out the structure for the current Intersessional Programme, 2018-2020. Table 1 shows the topics that are relevant to biological security education to be considered under each Meeting of Experts.

Table 1: Biological security education in the context of the BTWC Meeting of Experts[6]

MX1: Cooperation and assistance, with a particular focus on strengthening cooperation and assistance under Article X

- Promotion of capacity building, through international cooperation, in biosafety and biosecurity and for detecting, reporting and responding to outbreaks of infectious disease or biological weapons attacks, including in the areas of preparedness, response, and crisis management and mitigation;

MX2: Review of developments in the field of science and technology related to the Convention

- Development of a voluntary model code of conduct for biological scientists and all relevant personnel, and biosecurity education, by drawing on the work already done on this issue in the context of the Convention, adaptable to national requirements;

MX3: Strengthening national implementation

- Measures related to Article IV of the Convention;

MX4: Assistance, response and preparedness

- Exploration of means to prepare for, respond to and render assistance in case of the possible hostile use of biological agents and toxins against agriculture, livestock as well as the natural environment;

MX5: Institutional strengthening of the Convention

- Consideration of the full range of approaches and options to further strengthen the Convention and its functioning through possible additional legal measures or other measures in the framework of the Convention.

Examples of relevant Working Papers (WP) that were tabled by States Parties at the MSP in 2017 are shown in Table 2.

Table 2: Working Papers Addressing Biological Security Education

Article IV

BWC/MSP/2017/WP.19: This WP reports on the public-private partnership measures, including workshops, seminars, and on-site education programmes implemented by the Republic of Korea to prevent the misuse of biotechnology and raise awareness of the BTWC within the biotechnology industry and academic community.[7]

BWC/MSP/2017/WP.22: This WP puts forward a set of key points to be considered with regard to the implementation of biological security education and awareness including:

- The need to reach out, engage with, and build networks among stakeholders, including staff and students to ensure that learning will be effective.
- The need to develop appropriate teaching materials that take into account national circumstances.
- The benefits of international collaboration and shared experience and expertise.
- The benefits of using online technologies to facilitate communication and learning.
- The importance of sustainability.[8]

Article VII

BWC/MSP/2017/WP.11: This WP reports on a bio-preparedness field training exercise organised by Portugal underlining the value of such exercises in developing strong working multiagency relationships and strengthening command, control and coordination in a real incident, both nationally and internationally.[9]

Article X

BWC/MSP/2017/WP.17: This WP outlines biosafety and biosecurity activities, including training implemented by Global Partnership Member Countries.[10]

2.2 2018 Meeting of Experts and Meeting of States Parties

This subsection reviews the Summary Reports submitted by each of the five Chairs of the Meeting of Experts (Table 3). Whilst no consensus was reached by States Parties on the outcomes of the Meetings of Experts at the MSP in 2018, the Chairs' Summary Reports still provide an overview of the main issues considered at each Meeting of Experts.

Table 3: Considerations on Biological Security Education and Awareness at MX/2018

MX1: BWC/MSP/2018/MX.1/3

"29. States Parties highlighted the importance of promoting South-South cooperation in the field of capacity-building for detecting, reporting and responding to outbreaks of infectious disease or biological weapons attacks. It was proposed that further measures to facilitate such initiatives should be encouraged.

30. While noting that there is no agreed definition of biosafety and biosecurity in the Convention, some States Parties emphasized the need to take measures to broaden practical cooperation in these two areas for building capacity in developing States Parties, with the aim of shaping tailored solutions. [...]

32. The Meeting discussed the following practical measures: a database to serve as the reference on regulatory frameworks for biosafety and biosecurity; effective training provision and manuals that will help States Parties in crafting tailored biological risk management systems as well as in establishing, operating and maintaining laboratories for high-consequence pathogens."[11]

MX2: BWC/MSP/2018/MX.2/3

"9. At the level of scientific institutions, it was noted that they have an ethical and legal responsibility to ensure that biosecurity standards are maintained and for instilling a positive and transparent culture. [...] Some States Parties also noted that there could be *a role for*

self-governance which has the advantage that researchers' have a high level of familiarity with the given subject and the fact that it can allow for a more flexible response than regulation and legislation.

12. [...] Many States Parties spoke in favor of the need for voluntary codes of conduct, and several States Parties described national examples of such codes. It was emphasized that codes of conduct could be a useful tool to raise awareness among scientists about the risks of misuse, while taking into account the right balance between scientific freedom (a major driver of economic development), on one hand, and the potential risks posed by research outcomes being maliciously used by non-state actors or as a weapon of war, on the other.

13. Many States Parties also expressed the view that any such code of conduct should be voluntary in nature, but that it should be developed with the active participation of the scientific community to ensure that it has feasibility and is seen as being relevant to those at whom it is aimed. [...]

15. [...] A large number of States Parties expressed the view that the issue of codes of conduct was a topic on which progress could be made, with some States Parties considering that the MSP in 2018 could call for continued discussion on proposals and suggestions related to this topic. The participation of the scientific community in the discussion should take place during the intersessional programme, without pre-established timelines, and within a negotiation process led by States Parties."[12]

MX3: BWC/MSP/2018/MX.3/3

"4. [...] Some States Parties noted the importance of implementing an effective national biosecurity regime, including the development of a biosecurity culture to address these risks. In addition, the adoption of codes of conduct and specific training for personnel involved in the handling and transport of agents was mentioned as other possible measures. Furthermore, some States Parties informed the Meeting of Experts about their national biosecurity strategies as well as ongoing and continuous efforts to further strengthen national implementation of the Convention. [...] Additionally, the value of legislative or regulatory measures, awareness raising efforts, and biosafety and biosecurity training and education programmes were noted. Moreover, the benefit of a comprehensive approach at the domestic level including engagement with international partners, industry and academia was underlined by several States Parties.

8. States Parties shared different views regarding the implementation of Article III; [...] proposals referred to [...] regular outreach including industry and academia."[13]

MX4: BWC/MSP/2018/MX.4/3

"11. [...] several delegations described measures that they have adopted or are in the process of implementing at the national level to be ready to respond to infectious disease outbreaks, including of a deliberate nature. These included national response plans, rapid response teams,

training of experts CBRN specialized units, collaboration between the public health and enforcement authorities, as well as table-top and full-fledged field exercises, both national and with international elements, aimed at testing readiness."[14]

MX5: BWC/MSP/2018/MX.5/3

"5. States Parties made reference to a number of challenges facing the Convention, for example rapidly evolving developments in science and technology, proliferation, pandemics, together with the threat of use of biological agents or toxins for terrorist purposes, which underline the urgency of strengthening the Convention. [...] States Parties expressed the view that such developments in science and technology and the nature of armed conflict should be kept under review.

8. [...] With regard to Article VII, several States Parties referred to the need to enhance its operationalization [...] and the need for capacity-building at the national level to assist developing countries in improving their preparedness was also raised."[15]

2.3 2019 Meetings of Experts

This subsection reviews the Summary Reports submitted by each of the five Chairs of the Meeting of Experts (Table 4).

Table 4: Considerations on Biological Security Education and Awareness at MX/2019

MX1: BWC/MSP/2019/MX.1/2

"24. The Meeting heard examples of successful programmes, and several elements for successful outcomes were identified: [...]

ii) Training of scientists in biosafety and biosecurity was highlighted as an important component of twinning programmes; [...]

27. Some States Parties highlighted that building health system capacity and resilience through workforce development is a crucial element to disease outbreaks management, as health professionals are the first line of defence when it comes to detecting infectious diseases. A robust and resilient health system will be better prepared to manage outbreaks regardless of their origin, whilst at the same time continuing to maintain core healthcare functions."[16]

MX2: BWC/MSP/2019/MX.2/2

"18. A number of States Parties stressed the crucial importance of awareness-raising and education as a complementary and effective measure to reduce risks regarding dual-use research of concern. Some also remarked on the benefits of open online training and education

material. Additionally, some States Parties emphasized the importance of incorporating the Convention's provisions as well as biosafety and biosecurity related topics into university curricula. [...]

20. Many States Parties expressed the view that any code [of conduct] should be aspirational in nature and could thereby be conducive to norm-setting and strengthening the objectives of the Convention. In this regard, such a code should promote responsible behaviour of scientists and emphasize ethical and moral norms and values. It was also stressed that any such code cannot be imposed by governments but should be developed in close collaboration with, and the active participation of, the scientific community in order to ensure its acceptability and relevance."[17]

MX3: BWC/MSP/2019/MX.3/2

"6. Some States Parties referred to the benefits of developing a comprehensive approach at the domestic level including engagement with international partners, industry and academia. [...] Some States Parties reiterated the importance of implementing an effective national biosecurity regime, including the development of a biosecurity culture within relevant institutions. Additionally, the value of legislative or regulatory measures, awareness-raising efforts, and biosafety and biosecurity training and education programmes was mentioned. [...]

26. States Parties shared possible ways in which to strengthen effective export control measures. For example, regular outreach to all stakeholders including private industry and academia was highlighted as one element, in addition to offering countries technical support to develop and/or strengthen export control systems and build national capacities."[18]

MX4: BWC/MSP/2019/MX.4/2

"19. [...] Various delegations took the floor and shared their national experiences concerning strengthening national health systems and national response capabilities, including by means of national response plans, specialized response units, and regular table-top and field exercises, including the participation of relevant international organizations. [...]

20. [...] It was also stressed that in order to mitigate the consequences of the use of biological and toxin weapons, it was crucial to develop and strengthen the national capacities of States Parties. Some delegations reported on regional capacity building initiatives, including on biosafety, biosecurity, risk-assessment, disease diagnostics and outbreak management."[19]

MX5: BWC/MSP/2019/MX.5/2

"17. [...] States Parties also shared experiences regarding different types of exercises they had conducted and noted the benefit of these activities to strengthen coordination at the national and international levels. The linkage between Article VII and Article X was also underlined by some States Parties. [...]

20. Noting the implications of the rapid advances in science and technology, many States Parties expressed support for establishing a more structured approach under the Convention to the review of such developments. […] Additionally, broad support was expressed towards a voluntary model code of conduct for scientists based on a concrete proposal developed by two States Parties. With regard to this proposal, some stressed the key role of the scientific community in the development of a new code and recalled that many national codes already exist."[20]

2.4 2019 Meeting of States Parties

The 2019 Meeting of the States Parties to the BTWC "noted the value of the work of the Meetings of Experts and the discussions that took place".[21] During MSP/2019, the Chair of the Meeting and the Chairs of MXs/2019 submitted an *Aide Memoire* which compiles in a factual manner the proposals made during MXs/2019:

> *"4. The Aide Memoire is meant to assist States Parties in the lead-up to the 2021 Review Conference, in order to review the implementation of the Convention and to facilitate its operationalization. It is considered by the Chairpersons as a tool to link the meeting of experts with the meeting of states parties. As such, it is an evolving document which can be updated throughout the intersessional process."*[22]

Key proposals on the implementation of biological security education and awareness are presented in Table 5.

Table 5: Key Proposals with Relevance to Biological Security Education

***Aide Memoire*, BWC/MSP/2019/CRP.1**[23]

MX 1

- "Setting up a voluntary trust fund […]."

- "Promoting among States Parties understanding on specific measures for the transfer and exchange of information, materials and equipment including mobilizing adequate resources; enabling capacity building in States in need; […] exchanging scientists and providing training opportunities."

MX 2

- "Developing a model code of conduct for biological scientists and all relevant personnel, and biosecurity education, adaptable to national requirements, in order to prevent the misuse of dual-use research while ensuring that research for peaceful purpose is not hampered."

- "Considering the applicability of already available frameworks and principles to the BTWC context, including by tapping into academic material when relevant."

MX 3

- "Agreeing on a set of elements and principles for effective national export control, which could be established at the national level and could include: [...] regular outreach to all stakeholders including industry and academia."

- "Establishing, at the national level, a list of all relevant government agencies and organizing meetings with BWC focal points from other ministries, bio-safety associations, and the private sector to exchange views and enhance cooperation on CBM implementation."

MX 4

- "Increasing cooperation and information-sharing, at the local, national, and international levels to prepare for and respond to naturally occurring and intentional threats to agriculture, livestock, or the environment."

- "Identifying the linkages and synergies with Article-X, recognizing that strengthening surveillance, detection and response capabilities of national health systems, including through the establishment of a voluntary fund for assistance and capacity building, would help to tackle both infectious disease outbreaks of a natural origin and also enhance preparedness to mitigate the consequences of deliberate bio-events."

MX 5

- "Enhancing the role of the ISU to support national implementation and Intersessional Work Programmes."

"Intensifying of outreach and universalisation activities."

Two Working Papers submitted to the MSP/ 2019 by Germany and Portugal, respectively addressed the issue of biological security education, awareness-raising, and training. WP 3 provides an overview of Germany's implementation of Article X with a special focus on the "German Biosecurity Programme" which aims at reducing biological security risks by "fostering sustainable knowledge and capabilities based on long-term relationships and learning and making use of concepts such as the training-of-trainers approach":[24]

> *"10. [...] A newly established code of conduct for scientists in Tunisia raises awareness of questions of dual-use in biological research. Moreover, Germany assisted its Tunisian partners with the development of a biosecurity curriculum for health experts.*
>
> *11. [...] Activities [in Georgia, Kazakhstan, Kosovo, Ukraine, Egypt, Pakistan, Cameroon, Mauritania and Sierra Leone] include establishing methods for the detection and diagnostics of highly pathogenic bacteria and implementing international laboratory standards, educating young scientists, building national and international scientific networks and supporting awareness on dual-use and bioethics."*[25]

WP 4 submitted by Portugal reports on "a bio-preparedness field training exercise [CELULEX19] to support the development of sound international assistance capabilities to respond, investigate and mitigate disease outbreaks, including those due to alleged use of biological and toxin weapons":[26]

> *"32. CELULEX19 focused on investigating the suspected deliberate use of a zoonotic agent on livestock with the intent to cause harm. The exercise considered potential consequences to animal and human health, as well as larger societal, economic and ecological impacts. The wide scope of the exercise scenario enabled CELULEX19 to test different concepts and several types of evidence and samples, including biomedical (human and animal), environmental and post-mortem. The exercise adopted a comprehensive and integrated approach to investigating the alleged use of biological weapons.*
>
> 33. In CELULEX19, several International Organisations participated with experts and teams as training audiences and observers. Cooperation between States Parties and the International Organisations in charge of responding to outbreaks of human, animal or plant disease enables the global health security community to learn from previous experiences, and it further strengthens and enhances the BWC."[27]

3. Conclusions

The profound multifaceted implications of the COVID-19 pandemic have highlighted both the dangers that a disease outbreak can cause to the whole of modern society and the urgent need for enhancing the existing mechanisms for countering the hostile misuse of the life sciences and upholding the international norms of biological prohibition and disarmament. The preceding sections demonstrate that there is a growing recognition among States Parties of the vital role that biological security education, awareness, and outreach among those engaged in the life sciences whether in government, industry, or academia can play in strengthening the implementation of all elements of the BTWC. The underlying assumption of this paper is that engaging the global life science community with the Convention is an essential condition both for ensuring effective biological security governance and for reducing the risk that the life sciences could be accidentally or deliberately misused for causing harm to humans, animals, or the environment. Within this context, the 2021 Ninth Review Conference of the BTWC constitutes a pivotal moment for promoting effective action on biological security education, awareness-raising, and outreach. In particular, it is critical that specific mechanisms in this area are put in place under the Convention, in order to facilitate the process of fostering a biological security culture in the life sciences. Such mechanisms could include but be not limited to:

- **Establishing an Assistance and Implementation Biosafety and Biosecurity Training Clearinghouse**. Biosafety and biosecurity constitute essential elements of the implementation of the BTWC. The Assistance and Cooperation Database under Article X of the Convention shows that the requests for assistance in the area of Bio-risk Management which covers biosafety and biosecurity account for the largest proportion of all submitted assistance requests (31.4%).[28] The second-largest share of assistance requests covers a related area, namely Capacity Building, Training and Education (29.4%). Taken together, these assistance requests make up more than half (60.8%) of all submitted requests for assistance under the BTWC. The proposed Clearinghouse would seek

to address the need for practical guidance on the implementation of biosafety and biosecurity by providing up-to-date information on existing capacity building resources, training material, and promising practices, including methodologies for field and table-top exercises (Articles III, IV, and VII). It would further help promote awareness and understanding of the roles that different international organisations, government agencies, and civil society actors, e.g. academia, industry, professional associations, non-governmental funding bodies, science publishers etc., can play in strengthening biosafety and biosecurity (Article I). As such, the Clearinghouse could be of use to States Parties when developing their assistance requests (Article X). The Clearinghouse could be based upon the existing BTWC National Implementation Resource Repository[29] that could be further developed and re-designed with interactive features.

- **Establishing a Biological Security Code of Conduct for the Life Sciences under the Convention.** It is important that the relevance of the BTWC to life science professional practice is institutionalised. A Biological Security Code of Conduct for the Life Sciences would be instrumental in raising awareness of the Convention among life science professional communities and could contribute to promoting the establishment of designated academic curricula in this area. Moreover, the development of a Biological Security Code of Conduct under the Convention would further reaffirm States Parties' unequivocal commitment to the objectives of the BTWC and help ensure that the efforts to foster biological education, awareness and outreach continue to gather momentum.[30]

- **Establishing a Biological Security Workshop Series for Engaging Life Science Stakeholders with the Convention.** It is important that biological security is considered within the overarching frame of the international prohibition regime. Regular outreach and awareness-raising of the Convention among different life science sectors (e.g. public health, agriculture, bio-economy, research) and stakeholders (e.g. government agencies, private companies, professional associations, researchers, prospective scientists, funders, publishers) are key in this regard. The proposed Workshop Series would serve a two-fold purpose. First, the workshops would provide a platform for the consideration of practical steps and initiatives that different stakeholders could undertake in support of the implementation of the BTWC (Article I, III, and IV). Second, the workshops could be utilised for organising field and table-top exercises for strengthening capacities for preventing and countering biological events, including deliberate biological attacks (Article VII and X). To maximise impact and substantiate the Intersessional Process by providing an additional forum for stakeholder engagement with biological security, the Workshop Series could feature online and in-person regional events. The organisation of the workshops could be supported through a fund of voluntary contributions by States Parties and administered by the Implementation Support Unit (ISU).

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NATIONAL AND INTERNATIONAL DEVELOPMENTS

Use of Forensic Mycology in Criminal Investigation

Esha Gajbhiye

22 October 2020

The study of members of Kingdom Fungi is called as Mycology. Fungi are eukaryotic in nature and can be unicellular as well as multi-cellular. The use of mycological evidence for criminal investigations and its testing in court is called as Forensic Mycology. Most of the Fungi found are related to corpses and are also found in alternative substrates with high ammonia levels. One such Fungus is Hebeloma syriense which has earned itself the title 'The corpse finder'.

It plays a vital role in the process of decomposition of living beings. It is useful in recognising trace evidence; estimating time since death (post-mortem interval); determining time of deposition; investigating the cause of death; locating interred corpses; and biological warfare, etc. Application of Forensic Mycology is helpful in criminal investigations as well as testimonies in court. As of now, there have been significant applications of Forensic Mycology with respect to Forensic Medicine and Forensic Toxicology. There are certain legal aspects pertaining to the preparation of Fungi. The presence of Fungi inside the corpse can affect the constituents of the body.

Many species of fungi such as moulds and mushrooms can produce toxins and the action of most of them is long-term (for example, they are carcinogens) and some can be cultured in VATS (block that acts as a light source when it is placed down) in large amounts and produce quicker-acting substances that have potential as biological weapons.

See: https://legaldesire.com/use-of-forensic-mycology-in-criminal-investigation/

COVID-19 Vaccine Update: Pfizer Says 90% Effective

No coronavirus vaccines have yet been approved for general use internationally, but several candidates have reached the final stages of testing. They are based on several different approaches, including active, inactivated, DNA, RNA/mRNA-based, virus vectors and protein subunits, and there are three test phases vaccines must pass before they are sent to regulatory authorities for approval.

BNT162b2 is a messenger RNA (mRNA) vaccine from American-German duo Pfizer and BioNTech. Pfizer and BioNTech announce vaccine candidate against covid-19 achieved success in first interim analysis from phase 3 study. Vaccine candidate was found to be more than 90% effective in preventing COVID-19 in participants without evidence of prior SARS-CoV-2 infection in the first interim efficacy analysis. The vaccine also claims that the effect can last at least a year.

Pfizer cautioned that the initial protection rate may still change as time goes on and made clear that the vaccine was unlikely to be available before the end of the year. Nevertheless, Pfizer's senior vice president of clinical development, Dr. Bill Gruber told the Associated Press: "We are very encouraged."

See: https://www.dw.com/en/coronavirus-vaccine-90-effective-say-pfizer-and-german-company-biontech/a-55542947

INTERNATIONAL COOPERATION

Kazakhstan proposes multilateral biological weapons control system

Kazakhstan has put forward proposals at the UNGA to establish a special multilateral body – the International Agency for Biological Safety to control threat of biological weapons. According to the Kazakh President, Kassym-Jomart Tokayev, he growth of trade protectionism and political nationalism has caused critical collapse of global cooperation and led to "global dysfunction", which in turn undermine the prospects and hopes for a better world.

His reference to the Biological and Toxin Weapons Convention (BTWC) in the broader context of public health is noteworthy. It was one of five ideas to combat the pandemic, the other four being the upgrading of national health institutions; the removal of politics out of the vaccine; the revision of the International Health Regulations to increase capacities of the World Health Organisation (WHO); and the examination of the idea of a network of Regional Centres for Disease Control and Biosafety under the UN auspices.

See: https://armscontrollaw.com/2020/10/06/biological-weapons-a-surprise-proposal-from-kazakhstan-worth-exploring/

Chemical weapons watchdog ready to assist Russia in Navalny case

5 October 2020

Navalny fell ill on a flight in Siberia on Aug. 20 and was flown to Germany for treatment. German doctors say blood tests show he was poisoned with the Soviet-era nerve agent Novichok. The OPCW has collected its own samples to test at Germany's request.

Russia has said it has seen no evidence Navalny was poisoned, and denies any role in any attack.

The OPCW said in a statement on Monday its "Technical Secretariat is ready to provide the requested expertise and that a team of experts could be deployed on short notice."

See: https://uk.reuters.com/article/uk-russia-politics-navalny-chemicalweapo/chemical-weapons-watchdog-ready-to-assist-russia-in-navalny-case-idUKKBN26Q20I

DISARMAMENT

OPCW Issues Two Fact-Finding Mission Reports on Chemical Weapons Use Allegations in Aleppo and Saraqib, Syria

2 October 2020

The FFM's activities regarding the allegation in Aleppo included visiting hospitals to collect medical records and witness accounts, conducting interviews, obtaining information, and gathering other data. The FFM also received environmental samples from State Parties. It further analysed a range of inputs, including witness testimonies, results of environmental sample analysis, epidemiological and technical analyses, and additional digital information

from witnesses and State Party technical experts.

Pertaining to this allegation in Aleppo, the information obtained and analysed, the composite summary of the interviews and the results of the laboratory analyses did not allow the FFM to establish whether or not chemicals were used as a weapon in the incident that took place in the neighbourhood of Al-Khalidiyah and its surroundings in North-West Aleppo on 24 November 2018.

The FFM's activities regarding the allegation in Saraqib included collecting medical records and other digital information, conducting interviews, and gathering other data.

The results of the analysis of all available data obtained up until the issuance of this report did not allow the FFM to establish whether or not chemicals were used as a weapon in the incident that took place in Saraqib, in the Idlib Governorate, on 1 August 2016

The FFM's reports on these two allegations of chemical weapons have been shared with States Parties to the Chemical Weapons Convention. The reports were also transmitted to the UN Security Council through the UN Secretary-General.

See: https://www.opcw.org/media-centre/news/2020/10/opcw-issues-two-fact-finding-mission-reports-chemical-weapons-use

BIOLOGICAL WEAPONS CONVENTION – MEETINGS OF EXPERTS

Background

In December 2017, the BWC Meeting of States Parties agreed on an intersessional programme from 2018 to 2020 consisting of annual Meetings of States Parties and Meetings of Experts. The MSP agreed that the Meetings of Experts would be open-ended and will consider the following topics:

- MX1 - Cooperation and Assistance, with a Particular Focus on Strengthening Cooperation and Assistance under Article X
- MX2 - Review of Developments in the Field of Science and Technology Related to the Convention
- MX3 - Strengthening National Implementation
- MX4 - Assistance, Response and Preparedness
- MX5 - Institutional Strengthening of the Convention

The 2017 Meeting of States Parties agreed that:

- the purpose of the intersessional programme is to discuss, and promote common understanding and effective action on those issues identified for inclusion in the intersessional programme. The work in the intersessional period will be guided by the aim of strengthening the implementation of all articles of the Convention in order to better respond to current challenges.
- The Meetings of Experts for eight days will be held back to back and at least three months before the annual Meetings of States Parties. All meetings will be subject mutatis mutandis to the rules of procedure of the Eighth Review Conference. The Meetings of Experts are open-ended and all meetings will reach any conclusions or results by consensus.
- Each Meeting of Experts will prepare for the consideration of the annual Meeting of

States Parties a factual report reflecting its deliberations, including possible outcomes.

The Ninth Review Conference will consider the work and outcomes it receives from the Meetings of States Parties and the Meetings of Experts and decide by consensus on any inputs from the intersessional programme and on any further action.

Source: https://meetings.unoda.org/section/bwc-mx-2020-background/

Book Review

Neuroscience and the Problem of Dual-Use

Author: Malcolm R Dando

ISBN: 978-3-030-53790-6

Aakansha Bhawsar

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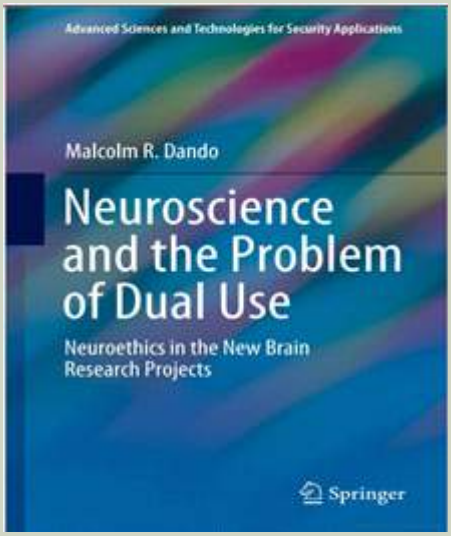

Professor Malcolm Dando, a biologist by training, Professor of national security in the University of Bradford, UK, who has long been involved in research and educating on nonproliferation of chemical and biological weapons, has contributed an essential book titled "Neuroscience and the Problem of Dual Use" in the domain of advancing life sciences, research ethics, its societal impact and disarmament regime.

Generally, the discussion developed around the dual use and misuse of modern sciences is somewhat broadbased, where the scientific community is considered as a single point source of originating and advancing problems. The scientific community can contribute their expertise in both making sure that responsible science is conducted in laboratories and also contribute their expertise to the discussion in developing codes of conduct or oversight systems or developments in international negotiations where their expertise is appropriate. The book could have also highlighted the role of publishers, funding agencies, national policy makers, international diplomats in shaping the way modern science progresses. Nonetheless, This book is classic in this broad approach and it introduces and presents the scientific community to be part of the modern solution and not the problem.

From the beginning, the author has widened the discussion of dual use, providing an accessible, thorough examination of current neurotechnology projects and developments. Alongside every discussion on concerns of scientific advances in brain sciences, the author has bought his scientist's point of view for solutions and best practices for both going forward to cure mental illness and also effective disarmament regimes.

The book is divided into three sections, first part discusses the concurrent rapid advancement, evolving dual-use concerns and related non-proliferation regime. Second part reviews and presents a descriptive analysis of various brain research projects being conducted in the European Union (EU), the United States (USA), Japan, and China. Concerns with various state's chemical and biological non-proliferation regime have been precisely discussed. What are different organizations, their aims, objectives and achievements that might instigate hostile concerns are investigated and alongside measures and procedures to deal with the problem of dual-use have been suggested. The third part assesses the implications of the civil-neuroscience research, the dark side of neurotechnology, which can facilitate the manipulation of human brains and become the source of development of novel biological and chemical weapons.

The book illustrates the rapid translational advances in brain science research and capabilities that neuroscientists had evolved and gained to investigate, study and manipulate the operations of the central nervous system. The questions and dilemmas of neuroscientists, of what they should do guard their nascent benignly-intended work from misuse is explained by referring to a similar ethical question faced by computer scientists after their work was scrutinized by Cambridge Analytica to analyze the 'likes' of Facebook users and the reaction that produced in democratic societies.

There are serious questions that need to be asked about how the new brain projects are going to go about protecting their results from misuse. The book raises questions as to what extent it is possible to forecast the consequences of technological changes? Quoting various research conducted the author argues that while it is generally difficult to forecast, a significant paradigm change has been noted in relation to chemical and biological weapons development. The advances in the life sciences have empowered weaponeers to shift their traditional focus from the external agents to the effective targets within the living system for the biological attack. Technological capabilities to manipulate living systems are illustrated by reference to the work on Parkinson's disease and the work on bioregulators and neuropeptides- orexin and oxytocin that could be misused for hostile purposes.

For our society, what kinds of problems are advancing with advances in the understanding of the central nervous system, how neuroethicists can deal with the future civil neuroscience problems and the development of novel chemical and biological weapons, how the debate on dual-use with regard to the Chemical Weapon Convention (CWC) and Biological Toxin and Weapon Convention (BTWC) has developed in past and recently, to all these concerns the book offers pointers about in the near-to medium-term future.

Life scientists need to develop a culture of responsibility, a code of conduct, especially around the ethical implications of neuroscience. The fragmentary nature of the disarmament systems need to be fixed and a well structured and comprehensive non-proliferation regime of chemical and biological weapons with international and national treaties for regulations that together provide a resilient web of prevention against biothreats and misuse of the life sciences.

The author answers how neurosciences could be protected against future hostile applications in the development of lethal chemical and biological weapons and concludes clearly that a lot more has to be done to improve the governance of dual use

research in the Neurosciences. Strengthening the biological and toxin weapons convention is vital, the author emphasizes the importance of a web of prevention for effective biosafety and biosecurity in the current time. The author expresses hope with the upcoming Review Conference in 2021, expecting progress in strengthening the BTWC, particularly in regard to codes of conduct and education is for CNS related toxins and neuro-weapons.

This book is a compelling wake-up call to all those who care about and have an interest in research on the workings of the human brain, nervous system and its dual-use potential for exploring the prohibitions of chemical and biological weapons. With dual use awareness, raising questions and recommendations for educating life scientists, military professionals, governments, and citizens, this is a concise well-illustrated foreknowledge that will tinker the ability to perceive, think and realize the dark reality of dual use research.

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