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BIOLOGICAL WEAPONS: THE PAST, THE PRESENT AND THE FUTURE

By: Samayeta Bal

INTRODUCTION

The numerous conventions, treaties and law surrounding the principles of international humanitarian law tries to minimalize the effect of war on humans, environment and property. In doing so it has laid down articles which recognises certain types of weapons as the conventional means of warfare, while prohibiting weapons of mass destruction. One of the three WMD, is biological weapons, on which the international community has set up strict guidelines with respect to the usage, multiplication, and possession of such weapons. Before in the next segment of the paper, the author will deal with biological warfare.

UNDERSTANDING BIOLOGICAL WEAPONS

Biological Weapons have often been considered to the be the poor man's atomic bomb. According to WHO, biological weapons are microorganisms like virus, bacteria, fungi or other toxins that are produced and released deliberately to cause disease and death in humans, animals or plants.[1] Unlike any other weapons of mass destruction, the aftermath of the usage of biological weapons is that it does not remain confined to a certain space, area or borders but rather proliferates easily through different delivery mechanisms, natural or artificial. The following are a few biological warfare agents[2]:

1. Bacteria: Can be used to spread diseases like anthrax, plague and tularemia.
2. Viruses: Can produce diseases like smallpox, Ebola, Venezuelan equine encephalitis and others which end up infecting animals, crops as well as humans.
3. Rickettsia: Diseases like Q-fever, typhus and Rocky Mountain spotted fever can be caused.
4. Fungi: Even though it can be used against humans, it's main usage is in destroying crops whose end result is that it can cause famine.

[1] WHO, https://www.who.int/health-topics/biological-weapons#tab=tab_1 (last visited March 28, 2022)

[2] Graham S. Pearson, *The Threat of Deliberate Disease in the 21st Century*, 18, BWP: Reasons for Concern, Courses of Action, 10, 14 (1998)

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5. Toxins: These affect only those who are exposed to it, as they are non-living remnants of living organisms.

USAGE OF BIOLOGICAL WEAPONS THROUGH HISTORY

The word 'biological weapons' though has gained momentum in the last few decades, it has been around since ages. One of the first noteworthy mentions with respect to such type of warfare was in the year 1155 AD, even though the most prominent incident of biological warfare before the 20th century was in 1797 AD when Napoleon flood the plains of Italy to spread malaria. It is important to notice that no such weapons were used up until the WWI, when the real modernization and militarization of biological weapons took place. Germany, during the World War I sabotaged the Allies, by infecting horses and cattle with glanders before shipping them off to Allied powers. Several countries began developing biological weapons on a large scale for military purposes in the years between the two world wars. Even though it was Japan who had the used Biological Weapon on a fairly larger scale during WWII by dropping ceramic bombs on China which contained fleas carrying bubonic plaque, it will be unfair to say that the other countries did not have any such active programs. As a consequence of the usage of BW during the WWI, many countries like USA, Russia, Canada, France etc. started acquiring a BW capacity. Such weapons were only kept as a precautionary measure, and for R&D, except for Japan.

'During the war, Japanese Army poisoned more than 1000 water wells in Chinese villages to study cholera and typhus outbreak. They dropped plague infested fleas over Chinese cities or distributed them by means of saboteurs in rice fields and along roads. Some of the epidemics they caused persisted for years and continued to kill more than 30,000 people in 1947, long after Japan had surrendered.'[3]

During the Cold War, which succeeded WWII, the Soviet Union and USA, were involved in a battle for procuring, accruing and researching more upon the usage of biological weapons. It is a heated discussion and debate on whether USA had used biological weapons during the Korean War. Enough evidence shows that the allegations made by the USSR, North Korea and China, are indeed true, especially because of the rapid germ testing that was going on, whereas many disapprove the fact by saying that USA neither had the will nor the capacity to execute

[3] Sheldon Harris., *Japanese biological warfare research on humans: a case study of microbiology and ethics*, 666(1), Ann N Y Acad Sci ,21, 24-25 (1992) https://doi.org/10.1111/j.1749-6632.1992.tb38021.x

such a wide scale action.[4] WHO in its report made it clear that USA had the intention to conduct biological warfare through the spreading of Pneumonic plaque against Vietnam which killed many during the Vietnam War.[5] All of the above are few examples that paints a perspective of the broad scope, unpredictability and disastrous effects biological weapons have on life.

DEVELOPMENT OF REGULATIONS SURROUNDING BIOLOGICAL WEAPONS

Even though earlier, usage of different types of harmful biological weapons were around, yet the line of differentiation between chemical and biological weapons were not distinct. In the Brussels Declaration, 1894[6], which form the basis of Hague Convention, the usage of poison or poison weapons in warfare was made illegal. During World War I, the extensive use of asphyxiating gas gave birth to a new age of human-inflicted mass destruction, which horrified the international community considerably. In 1925, during the Geneva Conference by the League of Nations, the Geneva Gas Protocol or the Protocol for the Prohibition of the Use of Asphyxiating, Poisonous or Other Gases and of Bacteriological Methods of Warfare[7] was signed so that the atrocities that occurred during WWI was not repeated. Taking considerable inspiration from the Treaty of Versailles, this protocol prohibited the use of such harmful weapons. The only limitation of the protocol was that it only banned the usage, and was silent on the development, stockpiling or production of such weapons, giving countries especially USA and USSR, a free pass to indulge in the associated activities. Also, during the signing of the protocol global powers held with themselves the exclusive rights to use such weapons as defensive warfare strategy. The race for disarmament of chemical and biological weapons had already started in the late 1960s through many national and international disarmament conferences. Though most were failures, yet it opened a dialogue between nations the need for the codification for weapons which were only biological. President Nixon of USA in the year 1969, decided to make regulations on a unilateral basis for the limited use of biological weapons, and mostly putting a stop to development of such weapons. Such a decision was also wrapped in a coat of fear, as there was a constant concern that any country could start developing offensive biological weapons. This was a precursor which encouraged the

[4] M. Leitenberg, The Korean War Biological Weapon Allegations: Additional Information and Disclosures, 24(3), *Asian Perspective*, 159–17 (2002) http://www.jstor.org/stable/42704276

[5] Seeley, T. D., Nowicke, J. W., Meselson, M., Guillemin, J., & Akratanakul, P, *Yellow rain*, *253*(3), *Scientific American*,128-137 (1985) https://www.jstor.org/stable/24967794

[6] Brussels Declaration art. 13(a), Aug 27, 1874, ICRC https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/ART/135-70013?OpenDocument

[7] Protocol for the Prohibition of the Use in War of Asphyxiating, poisonous or other gases and of Biological Methods of Warfare, 1925

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international community to adopt the first multilateral treaty only dedicated to biological weapons known as The Convention on the Prohibition of the development, production and stockpiling of bacteriological (biological) and toxin weapons and on their destruction. It was signed in the year 1975 and now has a total of 183 state parties who have ratified it, inclusive of the permanent members of UNSC.

REVIEWS OF THE CONVENTION

The state parties come together for a one to two week long conferences whenever needed to discuss, and review the working of BWC since the last review conference, and through their political will address the threats which has risen or might rise due to the threat of biological weapons.

1. First Review Conference, 1980 (3rd to 21st March)[8]
    - The 87 state parties were expected to submit voluntary declarations addressing 3 main issues like what were their previous possessions with respect to BWC, attempts that has been taken to redirect such weapons for peaceful uses, and national laws that were enacted which were in lines and supported BWC.
    - In order to develop better peaceful programmes the meaning of different types of cooperation under Article X was expanded.

2. Second Review Conference, 1986 (September 8th to 26th)[9]
    - The development of science and technology had raised quite a heated debate about proliferation and usage of biological weapons.
    - Since there was an outbreak of anthrax in USSR, and yellow rain in Southeast Asia and Afghanistan, made allegations with regards to the non-compliance of BWC, a major factor that steered the conference.
    - Confidence building measures were initiated which in turn led the state parties to exchange data with respect to biological weapons voluntarily.
    - Article V of BWC was strengthened as state parties agreed to have a consultative meeting whenever a state party alleged violation of BWC.

[8] Jenni Rissanen, The Biological Weapons Convention, NTI (March 28, 2022, 00:37 AM) https://www.nti.org/analysis/articles/biological-weapons-convention/#:~:text=The%20First%20Review%20Conference%20took,expanded%20upon%20at%20later%20conferences.

[9] Id at 8

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- Organised ways of cooperation under Article X of BWC was also discussed.

3. Third Review Conference (September 9th to 21st)[10]
    - The advancement of science and technology was again a topic that dominated the conference because the members started believing that situations which seems unforeseeable even a decade ago, was no more impossible.
    - Since the conference was held at the backdrop of the end of Cold War, the members also had to discuss the proliferation of biological weapons which would increase.
    - Massive elaboration on confidence building measures because even though extensive conversation was held on the importance of Article X in the previous conferences very little attention was actually given.
    - VEREX was establish to help strengthen BWC.
    - Reinforcement of Article VI which talks about investigation mechanisms.

4. Special Conference, 1994 (September 19th and 30th)[11]
    - VEREX had identified 21 measures through which the convention could be strengthened, and hence this conference was held to establish a final report of the same.
    - This conference was particularly important as it made the state parties focus on the absence of a legally binding verification mechanism.
    - In order to strengthen BWC, the state parties decided to formulate an Ad Hoc group, which would word towards formulating a legally binding document which would help in implementation of Article X.

5. **FOURTH REVIEW CONFERENCE, 1996** (November 25th to December 5th)[12]
    - Verification was a major theme of the conference, because even though there were great progress surrounding conventions related to other WMDs, non-compliance with BWC was a major concern as Australia, US, UK alleged former USSR and Iraq to have violated the convention.

[10] Id at 9
[11] Id at 10

[12] Id at 11

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- It was noted that even though the sharing of database had increased transparency between state parties, yet there was very less participation.
- It was also decided that even though the word 'use' is not explicitly written in Article I, it is a given, and thus also prohibited.

6. FIFTH REVIEW CONFERENCE, 2001-2002[13]

- The first part of the conference took place between November 19th to December 7th, 2001, and the second part was held on November 11th,2002.
- The main factor that dominated the conference was the sabotaged process of the Ad Hoc Group.
- The threat of biological weapons, especially bioterrorism was a major concern for state parties and even though they laid proposals to strengthen BWC, yet there was no collective response.

7. Sixth Review Conference, 2006 (November 20th to December 8th)[14]
    - It is deemed to be one of the most important conferences, as it gave BWC a new hope, as after this conference the BWC had started to stabilize.
    - All the articles of BWC was given a thorough review, which gave the state parties a chance to understand the lacunae in the BWC in the backdrop of the present times.
    - Implementation Support Unit was created to provide assistance to BWC related to administration.
    - The failures of the fifth conference was addressed effectively in this conference.

8. **SEVENTH REVIEW CONFERENCE, 2011** (Dec 5th to 22nd)[15]
    - This conference apart for addressing the generic issues related to BWC, also talked about the budget constraints.
    - It made continued efforts to keep on with confidence building measures and universalization of membership.

[13] Id at 12
[14] UN Digital Library, https://digitallibrary.un.org/record/593995?ln=en (last visited March 28, 2022)

[15] UN Office for Disarmament Affairs, https://www.un.org/disarmament/news/bwc_2011/ (last visited March 28, 2022)

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- When it came to understanding of the decision making powers in the intersessional process the state parties could not reach a consensus.
- An agreement also could not be reached on the enlargement of the ISU.

9. EIGHTH REVIEW CONFERENCE, 2016 (November 7th to 25th)[16]
    - This conference ended with disappointment as there was again no unity reached amongst member states with respect to any looking forward mechanism.
    - The structural shortcomings and ways to strengthen BWC was talked about, yet no fruitful outcome came out of the same.
    - Absence of an effective verification was again one of the main concerns that were discussed with no constructive results.

The 9th Review Conference was set for 2021, but has now been postponed to August 2022, which is liable to further changes. In the said conference, the members are said to talk about the progress the state parties have made when it comes to implementation of BWC, the new developments that has taken place in the field of science in the past few years etc.[17]

GENOME EDITING: A THREAT TO INTERNATIONAL SECURITY

Gene Editing is a process by which scientists using different technologies like CRISPR or ZFN or TALEN etc. can alter the DNA of an individual. It is considered to be a major breakthrough in the field of biotechnology, and yet one of its biggest disadvantages is the potential way it can be used to aid biological warfare. In 2016, 2017, and 2019, the "Worldwide Threat Assessment of the US Intelligence Community"[18] classified genome editing to be one of the potential threats to the peace of international communities as it could easily be used as biological weapons. Jiankui, a Chinese scientist has already made first gene edited babies[19], so scientific research has improved leaps and bounds. Since, gene editing is still at its nacent stages of development no such attack has yet been confirmed on national or global level, but through

[16] UNODA Meetings Place, https://meetings.unoda.org/meeting/bwc-revcon-2016/ (last visited March 28, 2022)

[17] UN Office for Disarmament Affairs, https://www.un.org/disarmament/biological-weapons/about/meetings/#:~:text=Since%20the%20Convention%20entered%20into,%2C%202006%2C%202011%20and%202016 (last visited March 28, 2022)

[18] SASC, https://www.dni.gov/files/documents/SASC_Unclassified_2016_ATA_SFR_FINAL.pdf (last visited March 28, 2022)

[19] Nature, https://www.nature.com/articles/d41586-018-07545-0 (last visited March 28, 2022)

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years we have seen that every time the global community sat together to discuss on an issue, that issue was unimaginable the previous time they met. So who is to say that in the next ten years that the maximization of the potential which gene editing holds would not be reached? We can't even begin to imagine the life altering changes a state might bring into the global scenario if they use such technologies in negative light in times of war. Non-state actors will go to any lengths to fulfil their political agenda, and such technologies at their hands would prove disastrous and fatal to the entire mankind.

COVID-19: DIFFERENTIATING NATURAL OUTBREAK AND BIOTERRORISM

With the emergence of the plethora of infectious diseases outbreak due to increase in global warming, human actions etc., it has become rather important to distinguish between a natural outbreak and an intentional act. In 2018, the Us government had come up with its first bio-defence strategy[20], a plan which included intentional bioterrorism threats as well as outbreak of diseases, caused due to spread of agents which escaped from labs. The difference between biological warfare and bioterrorism, is the user. Bioterrorism is carried out by non-state actors and as the name suggest mostly by terrorists. We are still recovering from the aftermath of the COVID-19 virus, yet none us will ever be able to forget the disastrous effect. Even COVID-19, did not escape the scrutiny, as many believed that it was a carefully developed virus in the labs of China[21], and its outbreak was a bioterrorist attack. Later on, this theory was rejected, yet, we have seen the intelligence of terrorist's time and again, so who is to say that they wouldn't be able to develop different strains of the virus, which might end up being more catastrophic. So, the line is quite blurred when it comes to distinguishing the two sides of the same coin. Few criteria like usage of rare biological agents spontaneously, detection of pathogens at locations where they were never found before, multiple places of origin for a particular agent at the same time, can be used to hint that there has been an intentional biological attack. These criteria are neither exclusive nor sufficient to distinguish between the two, and hence each case needs to be analysed individually and carefully.

[20] Homeland Security, https://www.dhs.gov/archive/coronavirus/presidents-biodefense-strategy#:~:text=As%20the%20president's%20September%202018,and%20to%20our%20interests%20abroad.%E2%80%9D (last visited March 28, 2022)

[21] Dr. Nalin Kumar Mohapatra, COVID-19, China's bioweapon strategy and global security, Economic Times (March 29, 2022, 10:23 PM) https://m.economictimes.com/news/defence/view-covid-19-chinas-bioweapon-warfare-strategy-and-global-security/articleshow/83321527.cms

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CHALLENGES TO BIOLOGICAL WEAPONS CONVENTION

A. The universality of the convention has been considered to be a way forward in most of the review conferences, and even though the membership has grown to 183 state parties, yet, there are still 10 states that have kept their distance from the convention.
B. The BWC, does not provide any provision which bans any biological research activities. This is mainly because completely restricting biological research would also mean that there wouldn't be any development to help the cause of the nation.
C. The convention is a disarmament treaty, and even though through Article X, the convention tries to bring in the factor of cooperation, it hardly serves as an effective instrument for the said cooperation.
D. There has been a lack of mechanisms to verify whether state parties comply to the provisions of the convention. Even though there are national means which has been adopted by different countries yet other countries can't approve of a different sovereign's set mechanisms.
E. There have been many allegations from one country to other, which are mostly based on the type of international relationship they countries share. Since, there is no clear line of differentiation as to what is natural and what might be intentional, it is difficult to legally back up the accusations as well as the stand of those countries against whom such allegations are made.

PROBABLE SOLUTIONS:

A. Immediate need for ratification of the convention by all the countries across the globe.
B. Even though there are no set restriction of biological research, all the countries should come together for a greater cause and maintain transparency amongst each other with respect to their biological activities in a manner which does not pose a threat on their internal security, in order to prevent any disaster.
C. All countries should negotiate once again as previous negotiations failed, and try to bring in another multilateral treaty should be signed which specifically talks about the mechanisms via which states party can comply to the provisions. This convention should also make sure that in case a country alleges another country, based on their political agenda, on proper verification, if such claims are found to be untrue, then the country making them should face consequences.
D. A constructive programme of work should be set for the intersessional process, so that there is not much delay in addressing the main issues surrounding the threats of biological weapons.

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CONCLUSION

Biological weapons have recently captured the world's attention and resources. It's dual use, has lead to it aiding the development in the field of science, but has also been a major concern as it can be easily harbored to create terror around the world. Advanced technologies at the hands of non-state actors will have devastating repercussions which needs to be addressed through conventions and it's proper implementation. The BWC, though tries to keep a check, there are still lacunae in the articles laid down, which are not competent enough to deal with the rising challenges that is brought about by science. Even a small-scale biological weapon deployment might result in widespread sickness and death, exhausting local medical resources. At a moment when violence is at its highest, the prospect of using BWMD is greater than ever, and the government, defence agencies, medical professionals, and, most importantly, ordinary individuals must be alert. It is critical to have a thorough scrutiny of the convention present, and the member states should thereafter make sure that a foolproof course of action is undertaken to tackle to new issues.