DAISMUN XV

Global Bioethics and Biotechnology Commission

Bioweapons: Silent Killers on the Run

Chair Report

DAISMUN XV

FORUM: 2030: Global Bioethics and Biotechnology Commission (GBBC)
ISSUE OF: Biological Weapons: Silent Killers on the Run
STUDENT OFFICER: Felix Guo
POSITION: President

Introduction to Committee:

Global Bioethics and Biotechnology Commission (GBBC) is a fictional committee created with the mission of starting the conversation about balancing advancements of medicine and biotechnology with ethical standards. Seeing the profitable nature of technological development, people had this tendency for facilitation in an almost radical way and often ignored the ethical issues that come with it.

Technology is still immature in the presence of societal perception, especially for biotechnology, which is one that's most associated with humanity itself. And that makes it a weakness. When gene editing allows the creation of a better version of you, what decisions will you make? What decisions will humanity make? Are we still able to wield the option? Though the committee is fictional, the issues it aims to address are present. At GBBC, delegates will foster a comprehensive understanding about possibilities and barriers of achieving a balance between biotechnology advancements and ethics frameworks from different perspectives—pharmaceutical and bio-related corporation, researchers, relevant government departments, and non-profit organizations—to gain insights of building a nuanced stability between public well-being, ethical accountability and universal regulations.

Introduction to Topic:

Biological weapons are microorganisms or toxins deliberately released with the purpose of causing disease and death in humans, animals or plants. Pathogens such as anthrax, botulinum toxin and plague can cause mass casualties and, if able to retransmit, epidemics. Such attacks may mimic natural outbreaks, complicating public health assessment or response efforts. In case of conflict, the targeting of high-threat pathogen laboratories can cause serious public health consequences. There are growing concerns about bioterrorism.

The earliest use of biological weapons dates to 1500-1200 BCE, when Hattusa empire sent plague victims into enemy territory, causing pandemics. It was recognized as a destructive weapon in WWI as the germ theory and bacteriology advancements emerged and was brought to the battlefield by the Imperial German on their behalf causing massive sabotages as thermal weapons. By WWII, bioweapons were seen by many countries as crucial to victory due to their destructive and untraceable nature. There are documentations of biological experiments conducted by Britain, the United States and Japan. The infamous Imperial Japanese Army Unit 731 was a biochemical warfare research unit was secretly carried out in Manchuria, China. Its

cruel acts and disregard for lives reflects that the existence of biological weapons itself is inhumane. It is worth mentioning that long before WWII began, the Geneva Protocol banning chemical and biological attacks had been signed. However, the facts show that there are widespread violations of the protocol, reflecting the potential problems and weak constraining force of international regulations.

Biological and chemical threats were a product of war, but in current times they are no longer limited to wars between nations. A typical example is the Tokyo subway sarin attack. In 1995, members of Aum Shinrikyo (a Japanese doomsday cult) released sarin on five trains causing considerably death and injuries. Biological threats have become commonplace, affecting every one of us. Once terrorists use pathogens to carry out terrorist attacks, causing an epidemic, it will cause great damage to public health. While no investigation so far indicates any deliberate spread of viruses, that's what makes it dangerous. Pandemics are time-sensitive, its origin can be untraceable, and it’s indistinguishable between natural outbreaks and man-made ones. Therefore, regulations on biological weapons need to be refined, including prevention, response measures, and accountability.

History of Topic:

The Geneva Protocol (1925) — The Geneva Protocol (1925), known as *Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare,* which banned the use of chemical and biological weapons in war, was the very first international agreement against weapons of mass destruction. It laid the groundwork for later treaties, such as the Biological Weapons Convention (1972), which expanded the prohibition. While it sets a moral and legal precedent, it lacks an enforcement mechanism and does not prohibit the development or stockpiling of such weapons. Despite limitations, the protocol remains a significant foundation for biosecurity efforts, particularly in regulating emerging biotechnologies to prevent further misuse.

Biological Weapons Convention (1972) — The Biological Weapons Convention (BWC), signed in 1972, enacted in 1975, was the first multilateral treaty to comprehensively ban the development, production, stockpiling and transfer of biological weapons. It is based on the Geneva Protocol and extends the prohibition beyond war. The Convention with 185 States Parties, establishes a global norm against biological weapons and emphasizes biosafety and ethical scientific research. However, the BWC failed to address the dual-use risks of modern biotechnology. Legitimate research in medicine and agriculture could be used to develop biological weapons, underscoring the need for greater oversight. Despite its limitations, the BWC remains vital in combating the threat of biological weapons and promoting international cooperation and transparency in biosecurity efforts.

The Sverdlovsk Anthrax Leak (1979) —The Sverdlovsk Anthrax Leak (1979) was the accidental release of anthrax spores that occurred in April 1979, from a Soviet military biological weapons facility, identified as Military Compound 19, in Sverdlovsk (now Yekaterinburg), Russia. The outbreak caused at least 66 deaths, though estimates put the death toll at more than 100. Initially, Soviet authorities blamed contaminated meat, but the real cause of the accident—a malfunction in the facility's filtration system—was concealed for more than a decade.

The leak demonstrates the untraceable nature of biological weapons, as the outbreak mimics natural events, complicates public health responses, and obscures accountability. It was only after the collapse of the Soviet Union in the 1990s that Russian President Boris Yeltsin acknowledged that it was an accident related to illegal biological weapons production. Western reviews and field investigations confirmed the airborne nature of anthrax spores, consistent with laboratory release.

The Sverdlovsk incident underscored the dangers of biological weapons, where accidental leaks can be indistinguishable from natural outbreaks, delaying responses and masking culpability. It stresses the need to strengthen biosecurity, transparency and international oversight to mitigate the risk of misuse or accidental release.

The Aum Shinrikyo Cult —The Aum Shinrikyo Cult was a Japanese cult with about 10,000 members in Japan and 30,000 worldwide at its peak, including highly educated scientific and medical professionals. The cult actively pursued biological weapons, making it one of the first non-state actors to do so. Between 1990 and 1993, the cult was responsible for at least nine biological attacks. They built facilities and equipment to mass-produce these agents but failed to cause harm due to technical errors. After repeated failures, the cult shifted its focus to chemical weapons, culminating in the 1995 Tokyo subway sarin gas attack, which killed 13 people and injured over 6,000.

The cult's efforts on biological weapons highlight the risk of terrorist groups accessing and attempting to weaponize biological agents. Although their bioweapons attacks failed, they revealed the challenges of detecting and preventing such threats. This incident highlights the need for biosecurity, intelligence sharing and international cooperation to prevent the spread of biological and chemical weapons among non-state actors.

CRISPR Gene-editing breakthrough (2012) — CRISPR (*Clustered Regularly Interspaced Short Palindromic Repeats*) is a powerful gene-editing technology that can precisely manipulate DNA, a major breakthrough led by Jennifer Doudna and Emmanuelle Charpentier. CRISPR began as a bacterial defense mechanism against viruses, using the enzyme Cas9 to cut DNA at specific locations. By pairing a guide RNA (gRNA) with a target DNA sequence, the scientists enabled it to precisely edit DNA in other organisms. CRISPR offers the highest accuracy and the highest cost-effectiveness, enabling more accessible gene modifications.

DARPA's Insect Allies Program (2016-Present) — DARPA's Insect Allies Program is a controversial initiative aimed at using genetically modified insects to deliver gene-editing tools like *CRISPR-Cas9* to plants, rapidly enhancing their resistance to pests, diseases, and environmental stress. The program is designed for use in crisis situations, such as wars, where crops could be targeted. While the technology has potential benefits for agricultural security, it raises concerns about its possibility to be repurposed—where modifying insects can spread harmful genetic material that could be used to destroy enemy crops or introduce harmful pathogens. Ethical issues and a lack of transparency also add to the controversy surrounding the program.

Advances in Biodefense Vaccines and Therapeutics (2020s) — There have been breakthroughs in developing faster and more effective solutions to biological threats. Accelerated by COVID-19 pandemic, key development such as mRNA vaccine technology, antiviral therapeutics, and broad-spectrum vaccines.

mRNA vaccine technology: mRNA vaccines, such as Pfizer-BioNTech and Moderna COVID-19 vaccines, have revolutionized vaccine development. These vaccines are designed, manufactured and distributed more quickly than traditional methods. mRNA technology is currently being used for biodefense purposes, including vaccines against pathogens such as anthrax, smallpox.
Antiviral therapy: Research into antiviral drugs has accelerated, with a focus on developing treatments that can quickly mitigate the effects of biological weapons or viral outbreaks.
For instance, antiviral treatments for pandemic influenza and Ebola have been refined, and new medicine are being developed against viruses that could be used for bioterrorism.
Rapid Response Platform: Advances in biotechnology platforms have enabled rapid production and distribution of vaccines and therapies. For example, bioreactor systems are being optimized to produce large quantities of vaccines in a short time. Point-of-care diagnostics are improving to enable faster detection of biological threats, which is critical for both military and civilian biodefense.

Rapid development of vaccines and treatments can improve the capacity to respond to biological warfare and pandemics and minimize potential harm. While focusing on biodefense, these developments also strengthen global health preparedness to respond to natural outbreaks such as influenza, and Ebola.

WHO's Global Action Plan on Biothreats (2021-present) — The WHO Global Action Plan on Biological Threats (2021-present) builds on previous frameworks and addresses gaps in global preparedness against biological threats. It advanced earlier regulations such as *the International Health Regulations (IHR)* and *the Biological Weapons Convention (BWC)* by focusing on modern challenges and harnessing technological innovations. It focuses on real-time genome sequencing and AI-driven early biothreat monitoring to share data faster through digital

platforms, enhancing surveillance. By actively support low - and middle-income countries through funding, training, and biosecurity infrastructure, including regional medical reserves, the plan makes global commitment of bring developing and third world countries into the perspective to eliminate blind spots. Noticing the time-sensitive nature of biothreats, it plans to establish regional teams and resource sharing to take rapid action in response to biological weapons attacks or outbreaks. Building on the previous framework, it provides stronger enforcement, innovation and high efficiency.

Key Issues:

Dual-Use Research Surveillance — Without careful regulation, advances in biotechnology such as CRISPR could be weaponized. Researchers can inadvertently lead to dangerous dual-use outcomes, while governments and organizations like the WHO struggle to implement effective oversight without stifling innovation.

Core to the issue: Lack of global ethical guidelines and dual-use research monitoring tools that could be misused by malicious actors.

Inadequate insurance and economic coverage — A bioweapons attack can lead to catastrophic public health and economic consequences, yet many insurance companies fail to include bioterrorism incidents in comprehensive coverage. Governments often bear the brunt of financial recovery efforts.

Core to the issue: Inadequate risk assessment models and a lack of public-private insurance partnerships hinder large-scale crisis preparedness.

Vaccine and treatment development lags — While medical companies have developed rapid response technologies like mRNA, these advances are often not available in low-income countries. Governments and global health organizations face challenges in financing, distributing and ensuring equitable access to responses.

Core to the issue: Profit-making models may prioritize high-income markets and delay the deployment of vaccines and treatments in vulnerable areas during bioweapons incidents.

Major Parties Involved:

1. For-Profit Companies

For-profit companies play a crucial role in the fight against biological weapons by developing vaccines, therapeutics and diagnostics to enhance global health security. Yet the prioritization of maximizing profits may hinder them from contribution. Their goals remain ambiguous, because

"profit" sometimes exceeds its financial meaning, building trust and reputation through ethical practice is also necessary, for it's a key factor of companies to be long-run profitable. They need to be careful about compliance with biosafety regulations to avoid causing threats to public well-being and facing potential fines.

2. Researchers

Researchers aim to advance knowledge, develop countermeasures such as vaccines and diagnostics, ensure the ethical use of biotechnology, work with stakeholders, and build global capacity to enhance biosecurity and protect against bioweapons. However, research requires manpower, equipment and resources. In another words, cash. Possessing cutting-edge cognition requires financial support to allow them to conduct experiments and research. When the sponsor is a profit-driven company, should the researcher accept the grant at the risk that the results of the research will be used directly or indirectly in an unethical area? If not, how do researchers find other supports?

3. Public Health Leaderships

Public health leadership, including organizations, institutes and governments, focuses on policy development, preparedness, surveillance and global collaboration to respond to biological weapons threats. Their goals are to enforce regulations, coordinate rapid responses, detect biological threats, promote international cooperation, raise public awareness, and support vulnerable regions to strengthen global biosecurity and resilience.

Possible Solutions:

1. Strengthen international regulations and oversight by establishing a strong global framework to regulate dual-use research and biotechnology and ensure transparency and accountability in both the private and public sectors. Governments and public health organizations must work together to develop and enforce regulations to prevent the weaponization of emerging biotechnologies.

2. Foster partnerships to develop and deploy rapid response biodefense technologies (vaccines, therapeutics, and diagnostics). Such cooperation can leverage the strengths of various sectors in a coordinated and effective manner to accelerate responses to potential biological weapons.

3. Investing in biosecurity infrastructure and training in high - and low-income countries. Governments and health organizations should work with research institutions and medical companies to ensure that all countries have the tools, knowledge and preparedness needed to effectively detect, prevent and respond to biological weapons threats.

Works Cited:

World Health Organization. “Biological Weapons.” *WHO*, https://www.who.int/health-topics/biological-weapons#tab=tab_1. Accessed 18 Jan. 2025.

“Biological Warfare” *Wikipedia*, Wikimedia Foundation, 24 Jan. 2025, https://en.wikipedia.org/wiki/Biological_warfare. Accessed 18 Jan. 2025.

Schier, J. G., and R. R. Miller. “Biological Warfare: A Historical Overview.” *PubMed Center (PMC)*, US. National Library of Medicine, 1 Sept. 2004, https://pmc.ncbi.nlm.nih.gov/articles/PMC1326439/. Accessed 18 Jan. 2025.

“Biological Weapons” *United Nations Office of Disarmament Affairs (UNODA)*, United Nations, https://disarmament.unoda.org/biological-weapons/. Accessed 19 Jan. 2025.

“Biological weapons in history”, *Encyclopedia Britannica*, https://www.britannica.com/technology/biological-weapon/Biological-weapons-in-history. Accessed 19 Jan. 2025.

“Biological Warfare and Bioterrorism: A Review of the Literature.” *PubMed Center (PMC)*, US. National Library of Medicine, 13 Dec. 2019, https://pmc.ncbi.nlm.nih.gov/articles/PMC7305902/. Accessed 19 Jan. 2025.

“Biological Weapons: The History and Future of Bioterrorism.” *UMBC Libraries*, University of Maryland, Baltimore County, https://lib.guides.umbc.edu/c.php?g=836720&p=6572896. Accessed 20 Jan. 2025.

“NTI Bio Proposes New Solutions to Prevent Bioweapons Development and Use.” *Nuclear Threat Initiative (NTI)*, NTI, https://www.nti.org/news/nti-bio-proposes-new-solutions-to-prevent-bioweapons-development-and-use/. Accessed 20 Jan. 2025.

Tomich, Jill. “The Role of Biological Weapons in National Security.” *Oxford Academic-BioScience*, Oxford University Press, 1 Dec. 1999, https://academic.oup.com/bioscience/article-abstract/49/6/465/229529?redirectedFrom=fulltext&login=false. Accessed 22 Jan. 2025.

“Faith, Fanaticism, and Fear: The Aum Shinrikyo—The Birth and Death of a Terrorist Cult.” *National Criminal Justice References Service (NCJRS)*, U.S. Department of Justice, https://www.ojp.gov/ncjrs/virtual-library/abstracts/faith-fanaticism-and-fear-aum-shinrikyo-birth-and-death-terrorist. Accessed 24 Jan. 2025.