Disarmament and International Security Committee

(DISEC)

Thomas Jefferson Model United Nations Conference

TechMUN XXXII

High School General Assembly

Co-Chairs: Tessa Joseph and Suraj Vaddi

Thomas Jefferson High School for Science and Technology

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Dear Delegates,

It is with immense pleasure that we welcome you all to TechMUN XXXII and to The Disarmament and International Security Committee. We are both TJ alumni from the class of 24 and 23 and are elated to be working with all of you in this upcoming committee. We are excited for a weekend of debate on some of DISEC's top issues: *The Proliferation of Autonomous Weapons Systems and Preventing the Weaponization of Biogenetics and Genetic Engineering.* Each of you will be representing a country, and we hope to be able to see those countries reflected through your solutions. In particular, we want to see your depth of research and understanding of not only the topics, but your country's stance on them as you debate.

This weekend we are looking for delegates with innovative ideas and detailed solutions to present and hope that every one of you will have a strong presence in committee to ensure debate is constantly flowing. As co-chairs, the dias would like to see eloquent, substance-filled speeches, along with exceptional leadership, teamwork, and diplomacy. While the committee is a place of debate, it is of utmost importance to be considerate and respectful of other delegates. We hope that every one of you step out of your comfort zone this weekend, whether it be through giving speeches without notepads or branching out more in unmods. Throughout the weekend, we hope to make this TechMUN as fun as possible and if you have any questions beforehand, please don't hesitate to reach out by emailing tjmodelun@gmail.com.

Tessa Joseph and Suraj Vaddi

Co-Chairs, Disarmament and International Security Committee

Topic A: The Proliferation of Autonomous Weapons Systems

Introduction:

Autonomous weapons systems mark a fundamental shift in military technology, raising serious questions about warfare's future and global security. These weapons can select and engage targets without direct human control—no longer just science fiction, but emerging reality. Their development forces us to confront legal and ethical challenges, along with risks of proliferation and conflict escalation. The conversation around these weapons involves many voices: governments, international bodies, scientists, and civil society groups. The debate is nuanced, requiring delegates to carefully examine competing arguments from all perspectives.

Current Situation:

Autonomous weapons development is accelerating globally, with nations taking diverse positions on their use. While we lack a universally accepted definition of Lethal Autonomous Weapon Systems (LAWS), the International Committee of the Red Cross defines them as weapons that can independently select and attack targets without human intervention. This highlights their core function: engaging targets on their own after initial human activation. The UN's Group of Governmental Experts continues to wrestle with establishing common ground, while major military powers invest heavily in researching and developing these technologies.

Weapons with some autonomous features have existed for decades, primarily in defensive roles—like anti-vehicle mines that operate based on preset triggers. More advanced systems now include missile defense networks that autonomously detect and engage incoming threats, sentry systems that identify and respond to intruders without human input, and loitering munitions that can search for and attack specific target types. The Turkish STM Kargu-2 drone reportedly saw

combat in Libya in 2020, autonomously attacking militia fighters—a troubling example of LAWS deployment. Meanwhile, AI-equipped platforms like the US Air Force MQ-9 Reaper, with enhanced navigation and target recognition, represent steps toward more sophisticated autonomous capabilities. The US Replicator program, which aims to deploy thousands of small, cost-effective uncrewed vehicles, further signals growing investment in autonomous systems.

The historical focus on defensive applications is shifting as AI and robotics advance, enabling more sophisticated offensive capabilities. Loitering munitions and attack drones exemplify this move toward systems that can independently identify and engage targets in offensive scenarios. This trend heightens concerns about unintended escalation and blurs the line between defensive and offensive warfare. Recent combat deployments of autonomous drones underscore their growing role and the urgent need for international dialogue about potential regulations. With both governments and private companies actively developing these weapons, the landscape grows increasingly complex, making effective oversight particularly challenging.

Possible Solutions:

The global community is exploring several ways to manage autonomous weapons proliferation. A key focus is maintaining "meaningful human control" over lethal force. Many nations support creating binding legal frameworks that would ban the most unpredictable autonomous weapons while regulating those that humans can meaningfully oversee. One compelling proposal would prohibit systems whose effects can't be reliably predicted, understood, or explained.

Practical regulations could limit these weapons' targeting capabilities, operational duration, geographical range, and scale of deployment. Giving operators the ability to deactivate

weapons after launch is another critical safeguard being discussed. Building in self-destruct or self-neutralization features could further reduce risks. Other commonly suggested restrictions include capping the number of engagements per mission, keeping autonomous weapons away from civilian-dense areas, and limiting targets to strictly military objectives. Addressing AI bias in targeting decisions is also seen as essential for responsible development.

While many states favor legally binding restrictions, some nations—often called "prohibitionists"—advocate for a complete ban on developing, deploying, and using lethal autonomous weapons. Others suggest a non-binding political declaration to establish norms and guidelines. The UN Secretary-General has called for a legally binding agreement by 2026 that would ban autonomous weapons operating without human oversight or those incompatible with humanitarian law. Ongoing talks within the UN Convention on Certain Conventional Weapons and the General Assembly demonstrate the international community's dedication to addressing this complex challenge.

Questions to Consider:

1. What constitutes "meaningful human control" in the context of autonomous weapons, and how can it be effectively implemented and verified?
2. How can compliance with the principles of International Humanitarian Law (IHL), such as distinction and proportionality, be ensured for autonomous weapons operating in dynamic and complex battlefield scenarios?
3. Who should be held accountable for violations of IHL committed by autonomous weapons, and how can accountability be established in the absence of direct human control over targeting decisions?

4. What are the potential risks of an arms race in autonomous weapons, and what diplomatic and arms control measures can be implemented to prevent such a scenario?

Helpful Links:

- https://www.icrc.org/en/law-and-policy/autonomous-weapons
- https://autonomousweapons.org/
- https://carnegieendowment.org/research/2024/08/understanding-the-global-debate-on-lethal-autonomous-weapons-systems-an-indian-perspective

Topic B: Preventing the Weaponization of Biogenetics and Genetic Engineering

Introduction:

Recent breakthroughs in biogenetics and genetic engineering offer tremendous potential for improving human health—from developing innovative therapies to boosting crop yields. However, these powerful technologies carry significant risks if misused to create biological weapons. The ability to manipulate life's fundamental building blocks raises alarming possibilities: engineering deadlier pathogens or modifying existing ones to resist treatments and evade detection. Tackling the weaponization threat requires a comprehensive approach spanning legal frameworks, scientific responsibility, and effective monitoring. Success in debate means understanding the basic science involved, existing international safeguards, the challenges of dual-use research, and potential risk mitigation strategies.

Current Situation:

Biogenetics studies the principles governing how living organisms develop and pass on traits. This field overlaps with genetic engineering—the direct manipulation of an organism's DNA in laboratory settings to alter its characteristics. These modifications range from changing single base pairs to deleting or adding DNA segments, or even transferring genes between species. The emergence of precise tools like CRISPR-Cas9 has dramatically expanded both the capabilities and accessibility of genetic engineering across medicine, agriculture, and research. While these advances bring tremendous benefits, they also increase the potential for developing biological weapons. This inherent duality—where the same techniques drive both progress and potential harm—creates significant prevention challenges.

The Biological Weapons Convention (BWC) forms the cornerstone of international efforts to prevent biological weaponization. As the first multilateral treaty banning an entire

weapons category, it prohibits developing, producing, stockpiling, and using biological and toxin weapons. Opened for signature in 1972 and enacted in 1975, the BWC has gained widespread support with over 180 countries signing and ratifying it. However, a major weakness is its lack of formal verification mechanisms to ensure compliance. While Review Conferences occur every five years to assess the Convention and address emerging scientific developments, concerns persist about potential loopholes and the risk of states or non-state actors exploiting rapid biotechnology advances for weapons development.

A key challenge in prevention stems from the dual-use nature of biogenetics research. "Dual-use" refers to biological research with legitimate scientific goals that could potentially be misused to create weapons. Examples include studies aimed at understanding pathogen virulence or transmissibility, host range expansion, or mechanisms of treatment resistance. Balancing scientific innovation with risk mitigation represents a complex challenge. Responsible research practices—including thorough ethical reviews and robust laboratory biosecurity measures—are essential for managing these dual-use risks.

Monitoring and preventing biological weapons development presents unique difficulties. The dual-use nature of biotechnology makes distinguishing between legitimate research and weaponization activities extraordinarily challenging. Biological weapons programs typically require smaller footprints than nuclear or chemical weapons programs, making them easier to conceal and harder to verify. Meanwhile, advances in genetic engineering and synthetic biology are outpacing the development of monitoring technologies. The globalization of scientific research and increasing accessibility of advanced biotechnology tools further complicate international oversight efforts. Building trust and fostering cooperation remain essential for

effective monitoring, though political tensions between nations often undermine these critical efforts.

Possible Solutions:

Addressing biogenetic weaponization risks demands comprehensive international collaboration. Strengthening the BWC is crucial—this could involve enhancing verification measures even without a formal protocol, improving national implementation, promoting research transparency, and encouraging voluntary confidence-building between member states.

Effective oversight of dual-use research is equally important. This requires developing national regulations and international guidelines governing potentially dangerous research. Cultivating scientific responsibility and ethical awareness is essential, through education programs highlighting dual-use risks and promoting ethical considerations throughout the research process.

Investing in advanced monitoring and detection technologies will enhance our ability to identify potential biological threats. This includes improvements in biosurveillance, environmental monitoring, and forensic analysis. Strengthening international norms against biological weapons through public awareness and education can foster a global environment that firmly rejects their development and use.

Enhancing global health security complements these efforts. Robust public health systems and effective disease surveillance networks help detect unusual outbreaks early, potentially flagging deliberate biological agent releases. Strengthening international cooperation in outbreak response builds trust and facilitates information sharing crucial for biosecurity. Promoting transparency and confidence-building measures among BWC parties creates a collaborative security environment that reduces misperceptions and distrust.

Questions to Consider:

1. How can the Biological Weapons Convention be strengthened to effectively address the challenges posed by rapid advancements in biotechnology and the lack of a formal verification mechanism?
2. What are the most effective ways to oversee and regulate dual-use research in biogenetics at both national and international levels, while ensuring that legitimate scientific progress is not unduly hindered?
3. How can international cooperation and information sharing be enhanced to improve the monitoring and prevention of biological weapons development and proliferation?
4. What specific role should the scientific community play in preventing the misuse of biological research and technology, and how can ethical considerations be effectively integrated into scientific practice?

Helpful Links:

- https://www.who.int/news-room/q-a-detail/biological-weapons
- https://www.armscontrol.org/factsheets/bwc
- https://www.sipri.org/research/armament-and-disarmament/chemical-and-biological-weapons
- https://fas.org/issues/biological-weapons/

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