STUDY GUIDE

HFS MUN 2024

THE XIII SESSION

WHO

World Health Organisation

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Letter from the Executive Board

Dear Delegates,

The Executive Board of the World Health Organisation (WHO) extends a warm welcome to all delegates participating in this year's session of the HFS MUN.

While some delegates may be participating in their first ever conference, others may be looking to add to their list of achievements. We would like to assure you that regardless of your experience, this committee will both test you and teach you. The World Health Organization is an organ of the U.N. that holds unparalleled influence over global health policies. This means that the decisions that delegates of this committee shall make will affect billions, requiring the highest degree of prudence.

This committee, under the chairpersonship of three highly experienced members of the MUN community, is tasked with discussing one of two increasingly relevant and controversial matters. The first requires delegates to deal with the constantly escalating threat of biological weapons with capabilities to cause death and destruction on scales unthought of. Delegates must negotiate viable strategies for building resilient medical infrastructure and international cooperation frameworks in order for humanity to survive the possibility of biological warfare. The latter will task delegates to deliberate upon the ethicality, safety, viability and implications of medical procedures involving genetic modification in humans, a widely debated issue that demands both compromise and resolve.

Needless to say, delegates will be expected to display their tenacity every step of the way - from the quality of position papers to be submitted to the manner in which you lobby, negotiate, present your views as well as defend them in committee.

A perusal of this Study Guide is meant to be a mere commencement of the efforts delegates must take to shine in this committee. A tool to familiarise you with key concepts relating to the agendas, you must expand your research beyond this document until you attain a firm grasp upon the stance you will deliver for your country.

The Executive Board wishes all delegates the very best of luck and eagerly anticipates to see the culmination of your efforts in August.

Regards,
The Executive Board,
World Health Organisation.

Navya Amitabh Luhadia - Director
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Agendas

Measures to safeguard global Health Security in the face of drastic Development of Biological Warfare Technology

Deliberating upon potential Negative impacts of rapid Advancements in Gene-editing Technology on Human Genomes and its Implications on overall Physical, Mental, and Social Well-being

Agenda I

Measures to safeguard global Health Security in the face of drastic Development of Biological Warfare Technology

Key Terms

Biological Weapon: As defined in the Biological Weapons Convention, Biological Weapons can be either:

- Microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes,
- Or, weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict.
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Put simply, biological weapons are those weapons of mass destruction that include disease-causing organisms or toxins used to harm humans, animals or plants, as well as their means of delivery.

Biological Warfare: The employment of the aforementioned biological weapons to cause disease or death as an act of war.

Biological Weapons Convention: International treaty that bans the use of biological weapons in war and prohibits all development, production, acquisition, stockpiling, or transfer of such weapons.

Genetic Engineering: The artificial manipulation, modification, and recombination of DNA or other nucleic acid molecules in order to modify an organism or population of organisms.

Dual Use Technology: Items have a primary commercial/civil application but also have the potential for military or weapons applications.

International Health Regulations (IHR): Legal framework that defines countries' rights and obligations in handling public health events and emergencies that have the potential to cross borders.

Bioterrorism: The intentional release of biological agents or toxins for the purpose of harming or killing humans, animals or plants with the intent to intimidate or coerce a government or civilian population to further political or social objectives.

Global Health Security: The activities required, both proactive and reactive, to minimise the danger and impact of acute public health events that endanger people's health across geographical regions and international boundaries.

Global Health Governance: The use of formal and informal institutions, rules, and processes by states, intergovernmental organisations, and non-state actors to deal with challenges to health that require cross-border collective action to address effectively.

Biodefence: Actions to counter biological threats, reduce biological risks, and prepare for, respond to, and recover from biological incidents, whether naturally occurring, accidental, or deliberate in origin and whether impacting human, animal, plant, or environmental health.

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Epidemiology: The study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems

Pathogen: An infectious microorganism or agent, such as a virus, bacterium, protozoan, prion, viroid, or fungus able to produce disease.

Quarantine: The isolation of individuals or groups who have been exposed to contagious diseases to prevent their spread.

Pandemic: An epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people.

Epidemic: The occurrence in a community or region of cases of an illness, specific health-related behaviour, or other health-related events clearly in excess of normal expectancy.

Zoonotic Disease: Disease or infection that is naturally transmissible from vertebrate animals to humans.

Vaccine: Suspension of weakened, killed, or fragmented microorganisms or toxins or other biological preparation, such as those consisting of antibodies, lymphocytes, or messenger RNA (mRNA), that is administered primarily to prevent disease.

Rapid Diagnostic Tests (RDTs): Medical diagnostic tests that involve non-automated procedures and are designed to give fast results.

Medical Countermeasures (MCMs): Materials used to prevent, mitigate, or treat adverse health effects, such as Pre-Exposure Prophylaxis (PrEP) /Post Exposure Prophylaxis (PEP) and therapeutics, diagnostic tests, and Personal Protective Equipment (PPE).

Public Health Infrastructure: The comprehensive system of facilities, workforce, information systems, organisational capacity, community partnerships, and regulatory frameworks that collectively support the planning, delivery, and management of public health services and programs.

Disease Eradication: Permanent reduction to zero of the worldwide incidence of infection caused by a specific agent as a result of deliberate efforts.

Antimicrobial Resistance (AMR): Resistance developed by microorganisms such as bacteria, fungi, viruses and parasites to antimicrobial medication due to its misuse or overuse.

Biosafety Level (BSL): A set of biocontainment precautions required to isolate dangerous biological agents in an enclosed laboratory facility, ranging from 1 to 4.

Containment Laboratories: High-security labs designed for the safe study and handling of dangerous pathogens, equipped with advanced safety protocols.

Introduction to & History of the Agenda

Humans have a long history of trying to poison or infect others, particularly in warfare and long before scientists discovered germ theory. In the ancient world at least three types of actions were commonly used: poisoned arrows or garments, infecting/poisoning a food or water supply (especially with corpses and dead animals), and use of venomous/toxic animals against enemies (snakes, bees, scorpions, etc..)

During the 14th and 15th centuries, biological agents were used to end sieges during mediaeval wars. In what is now northern France at Thun L'Eveque, 1340 AD, dead animals were launched into the castle. The castle defenders reported, that the stink and air were so abominable, that they considered how that finally they could not long endure. A short while after the biological attack the defenders of the castle negotiated a truce and later abandoned the castle.

In 1346 at Kaffa now present-day Feodosia, Ukraine, humans in the attacking Tartar army who had died of plague were launched into the castle. An outbreak of plague in the castle ended the siege. While fleeing Kaffa, some believe that these infected refugees may have carried the disease to Italy, contributing to the second major epidemic of "Black Death" in Europe during the 1300s.

The launching of dead soldiers into the castle may, however, be an overly simplistic view of the cause of the plague outbreak in the castle at Kaffa. In fact some believe it might not even be an example of biological warfare but rather an example of a natural plague outbreak relatively common in that day and age. Fleas are the principal vectors in transmitting the disease from infected rats to humans. Rat-to-human transmission via flea bites is the most common means by which plague epidemics begin. Fleas usually abandon dead bodies so it is unlikely that launching a few dead bodies into the castle would have caused an outbreak of this disease. Plague outbreaks were not uncommon at this time. In fact, the Tartar army outside the castle reported that their comrades died of this particular disease. Others believe that the plague may have been brought to Kaffa by a naturally occurring cycle in which plague-infected rats from the wild intermingled with urban rats in Kaffa causing large numbers of the urban rats to die. This left the fleas who spread the disease no place to get a blood meal but from humans, thus starting the plague in the city. Regardless of how the plague started in Kaffa the biological agent, Yersinia pestis, helped the Tartars take their objective.

In 1763 during the French and Indian War, British Gen. Jeffery Amherst the commander at Fort Pitt, Pennsylvania ordered blankets and handkerchiefs from smallpox victims be given to the Delaware Indians at a peace-making parlay. Historical records indicate that Amherst clearly wanted to, Extirpate this execrable Race. However, there is no definitive evidence that his gift of smallpox-contaminated blankets actually caused the smallpox epidemic that occurred in the Delaware Indians the following spring. Amherst clearly intended to give the Indians smallpox however, other outbreaks of smallpox were occurring at the same time decreasing the certainty that these contaminated blankets caused the smallpox outbreak. In any case the Delaware Indians defending Fort Carillon sustained epidemic casualties, which contributed to the loss of the fort to the English.

Smallpox-contaminated blankets were also believed to be used to spread disease to others throughout the colonies even through the Civil War. However, there is little data to show how effective these BW attacks were.

During the Revolutionary War it is reported that the British tried to transmit smallpox to the Continental Army. In WWI from 1915-1918 the Germans used biological agents to attempt to cause severe disease (glanders and anthrax) in the horses and mules used by the Allies. However, no one knows for sure if the animals that did die during the voyage across the Atlantic were due to glanders, and anthrax or whether their deaths were due to some other factor. Once again most reports indicate that these attacks were not very effective.

The Japanese developed biological weapons under the command of General Shiro Ishii (1932-1945) and Kitano Masaji (1942-1945) during the Sino-Japanese War (1937-1945) and World War II. The Japanese program built several facilities in cities all over China. The most commonly cited program began in 1937, located 40 miles south of Harbin, Manchuria, in a laboratory complex code named "Unit 731". Ishii became convinced of the potential of biological weapons in the 1920s and he lobbied his superiors persistently until he was assigned to develop a BW program in their fight against the Chinese. Unit 731 eventually contained 150 buildings, 5 satellite camps, and a staff of more than 3,000 scientists and technicians. In 1939 Ishii began field tests using the BW they had developed using prisoners, indigent Chinese and prisoners of war. A post WWII investigation revealed that the Japanese had examined many organisms for their use as BW.

Over the next three years, the infamous Japanese Army Units 731 and 100 carried out biological attacks on military and civilian targets. They used saboteurs to contaminate water wells with bacteria that caused intestinal diseases, distributed food laced with disease-causing microorganisms, and air-dropped fleas infected with the plague bacterium. In 1940, a plague epidemic in China and Manchuria followed reported sightings of Japanese planes flying over the area. Many believe they dropped plague-infected fleas on the areas. By 1945, the Japanese program had stockpiled 400 kilograms of anthrax to be used in a fragmentation bomb. The Japanese BW program (1932-1945) killed between 5,000 and 10,000 prisoners as a result of experimental infections or execution following experimentation. Some believe that several hundred thousand Chinese casualties were the result of Japan's BW attacks. However, this is disputed and estimates of casualties vary widely from 1,000 to over 222,000. Studies continued at Unit 731 until 1945, when the complex was destroyed after the war.
Even though Unit 731 was destroyed the U.S. and several other nations prevented the scientists in this unit from being prosecuted for war crimes but rather took them from Japan to their countries to help with their own fledgling BW programs. At that time the BW program in the U.S. had built at least 4 different BW facilities.

Many different countries began biological weapons programs in the 1920s, 1930s, or 1940s. The BW program was terminated in France, following its occupation in 1940. The defeat of Germany and Japan in 1945 ended their BW programs. The British and Canadian BW programs ended soon after World War II.

Table 1: Year(s) Various Countries Began Their Biological Warfare Program

Country	Year	Country	Year
Canada	1938	Italy	1934
China	1950s	Japan	1932
France	1922-1928 and 1934-1940	North Korea	1960s
Germany	1940	South Africa	mid-1980s
Hungary	1936	United Kingdom	1936
Iran	1984	Union of Soviet Socialist Republics	1926
Iraq	1975	United States of America	1943
Israel	1948		

However, the cold war following WWII between the United States Socialist Republics (USSR) kept their biological weapons programs going full steam ahead. Both nations invested large amounts of time and money to develop substantial stockpiles of biological agents and the means to send those agents behind enemy lines. Both countries examined the potential military use of many different bacteria, viruses, and biological toxins. Methods to deliver the BW as a fine-mist aerosol, to package them in bombs, and to launch them in missiles were developed and tested. Methods to assassinate individuals with BW were also developed.

The U.S. offensive BW program began in 1942 or 1943 (there is some disagreement among sources concerning the time the program began) under the War Reserve Service, a civilian agency. The program began with a research and development facility in Fort Detrick, Maryland, testing sites in Mississippi and Utah, and a production facility in Terre Haute, Indiana. Unfortunately, adequate safety measures were not built into the production facility and testing revealed BW contamination of the plant and its environs. These findings slowed further development of large-scale production during WWII. However, they did produce 5000 bombs containing anthrax.

After WWII Japanese scientists were brought to the U.S. from Unit 731. They were granted immunity from war crimes prosecution if they would disclose information concerning their BW program. Some indicate that these Japanese scientists did little to help the expanding U.S. BW program. The BW program expanded during the Korean War (1950-1953). A new production facility was built with adequate safety measures in Pine Bluff, Arkansas. Large-scale production of BW was conducted in this plant starting in 1954. The U.S. also started a countermeasures program, which included vaccine, antisera, and antibiotic production and stockpiling. This program was designed primarily to protect military personnel.

Military and civilian volunteers were used in experiments started in 1955. Biological munitions were detonated in a 1-million litre, hollow, metallic, spherical chamber at Fort Detrick. This sphere called "the eight ball" was used to expose human volunteers to Francisella Tularensis (tularemia) and Coxiella Burnetii (Q fever). They conducted these studies to test how vulnerable humans were to aerosolized pathogens and to determine the efficacy of various therapeutics.

Other supposedly nonpathogenic organisms (simulants) were used to test the ability of BW to spread once released into the air. New York City and San Francisco were surreptitiously used to see which means of aerosolizing BW worked best, to study the effects of sunlight on the viability of the aerosols, to determine how wind and weather affected the aerosols and to characterise the behaviour of aerosols over large geographic areas. Some believe a Serratia Marcescens simulant release in 1951 may have caused an outbreak of urinary tract infections at Stanford. Several other outbreaks of disease due to these bacteria were also thought to be due to the release of a stimulant. However, the bacteria from patients supposedly infected by the simulant were antigenically different from the bacteria used by the military in their simulant release experiments. Regardless of whether these simulants actually caused these outbreaks simulant releases ended by 1968

It was not until 1976 that the general public was made aware of the simulant release experiments. Public outcry resulted in several unsubstantiated claims of disease outbreaks following simulant releases. Senate hearings were conducted in 1977 and the army was severely criticised for its continued use of simulants following the Stanford outbreak

Animal studies were also performed at Fort Detrick and open-air studies were conducted at remote desert sites and in the South Pacific. One of the last of these open-air tests was conducted in 1969 upwind of a small atoll in the south Pacific. They used a jet, caged Rhesus monkeys on barges, and an unknown BW to test the effectiveness of this method of warfare. Barges containing caged Rhesus monkeys were positioned up to 50 miles downwind of the Atoll. A jet flew past the upwind side of the Atoll and released the BW into the air. The wind carried the powder now a long thin cloud past each barge. Over the next few days half of the monkeys died. Some of the monkeys in the barge fifty miles away from the BW release also died .

Later that same year, on November 25th, President Nixon issued an executive order that unilaterally and unconditionally renounced all methods of biological warfare. This order ended the U.S. offensive BW program and resulted in the destruction of the nations BW program and BW stockpiles. Henceforth the U.S. The BW program would be confined to research on strictly defined measures of defence, such as development of diagnostic tests, vaccines and treatments for BW. The following year on February 14th President Nixon ordered the destruction of all toxin weapons. However, the Central Intelligence Agency did not comply and illegally retained samples of the biological toxin ricin. In 1975 a congressional hearing admonished the CIA for its noncompliance (13).

Many felt the U.S. terminated their BW program because of concerns that military personnel were not prepared to handle BW and that BW was untried, unpredictable and potentially hazardous to the users as well as those under attack (13). However, others argue that BW was adequately tested and proven to be quite predictable. Similar measures used to protect troops during chemical weapons attacks during WWI would also protect troops in the field during a BW attack. They state that the U.S. government was more concerned with a continuing proliferation of BW programs in other countries. Many at that time believed other countries would feel compelled to start their own BW programs making the world even less stable. Several countries wanted to start WMD programs to tip the balance of power in their favour. Many analysts also knew that the production of BW would be a less detectable WMD to develop than a nuclear WMD program. Therefore, some conclude that the U.S. ended their BW to slow the proliferation of BW as a WMD.

Meanwhile, the USSR began in 1926 what eventually became the largest, most ambitious, and most advanced covert BW program on earth. A new BW facility was built in Sverdlovsk in 1946 and another was built in 1953 in Kirov. In time four different BW institutes were created under the Ministry of Defense. Several other government ministries also conducted BW research and development programs: the Ministry of Agriculture, the Ministry of Health, and the Academy of Sciences.

In 1973, the USSR began a major expansion of their BW programs and created the Biopreparat or The System They built around 8 production facilities and several standby BW production factories of enormous capacity that they could use if directed to during war. Stockpiles of tens of tons of three anti-human biological agents were allegedly maintained. Not only did they work with existing strains of BW they also genetically modified certain bacterial BW agents making them resistant to many of the antibiotics used in treating people exposed to these agents. Fortunately, no stockpiles of the genetically modified agents were produced. In time there may have been as many as 40 to 50 different institutions in the USSR working on BW. They employed a total staff of about 60,000 (support staff, technicians, and scientists). They also did some open-air testing of their BW on an island on the Aral Sea. Meanwhile, most of the world was oblivious to this enormous BW program.

In 1979, an outbreak of anthrax in the city of Sverdlovsk killed nearly 70 people. The Soviet government publicly blamed contaminated meat, but U.S. and U.K. intelligence sources suspected the outbreak was linked to secret BW work at a nearby lab. During the 1980s various intelligence agencies became more and more convinced that the Soviets had developed a large BW program. However, it was not until between late 1989 and 1992 that the British and American governments were able to confirm their suspicions. Defectors in senior management positions from the USSRs BW program provided information to the U.S. and U.K. that led to concerted efforts by the U.S./U.K. to get the Soviet program closed down. This information was not given to the public until several years later .

In 1992, President Yeltsin admitted that the outbreak of anthrax in Sverdlovsk was due to an accidental release from a Soviet Ministry of Defence research and development facility. The dissolution of the USSR by the Supreme Soviet in 1991 and President Yeltsin's Decree in 1992 to stop BW production many believe spelled the end of their BW program. After the dissolution of the Soviet Union, Russia allowed inspectors to talk with people in and around Sverdlovsk. They were able to confirm that an accidental release of anthrax from the BW plant killed the Sverdlovsk citizens. However, it is still uncertain whether the entire BW program was destroyed

Iraq began its BW program in 1974. By January 1991 Iraq had produced large quantities of anthrax, botulinum toxin, Clostridium perfringens, aflatoxin, and small quantities of ricin, and had more than 180 biological weapons deployed to five hide sites. After Desert Storm ended, UN inspectors determined that Iraq had bombs, Scud missiles, 122-mm rockets, and artillery shells armed with botulinum toxin, anthrax, and aflatoxin. They also had adapted spray tanks fitted to aircraft that could distribute BW. Fortunately, the opening Desert Storm bombardment of January 17, 1991 destroyed the only aircraft and spray tank ready for BW deployment. Around 300 people were involved in BW research and development in Iraq. The United Nations weapons inspectors destroyed as much of the BW program as they could find following the end of the Desert Storm. Unfortunately, the Iraqi government did not fully cooperate with UN weapons inspectors and many believed that Iraq still maintained a BW program until 1996.

South Africa began a covert BW program in 1980 administered by the Surgeon General's office of the South African Defense Forces (SADF). Front companies were set up to conduct research and development work. The number of BW staff members was small, apparently under 12, with the primary agents of interest being anthrax and cholera.

Only very small amounts of the BW were prepared and stored. They used their BW in two ways: anthrax was used in assassinations by placing it in food and drink and cholera was placed in wells in areas where the SADF was fighting insurgents. The use of BW resulted in minimal insurgent losses. Their BW program did not develop weapon systems or substantial stockpiles. In 1993, after South Africa's involvement in the Angolan war had ended, President de Klerk ordered the destruction of any remaining BW.

Important Functions & Privileges of the Committee and its Members

The World Health Organisation (WHO) is a specialised agency within the United Nations body. The WHO is responsible for numerous functions, mainly focused on the well being of human life and combating health risks. The WHO, as of 2024, has 194 member states, of which all 194 are represented in the World Health Assembly, which is the decision-making body of the WHO.

"It is responsible for providing leadership on global health matters, shaping the health research agenda, setting norms and standards, articulating evidence-based policy options, providing technical support to countries and monitoring and assessing health trends."

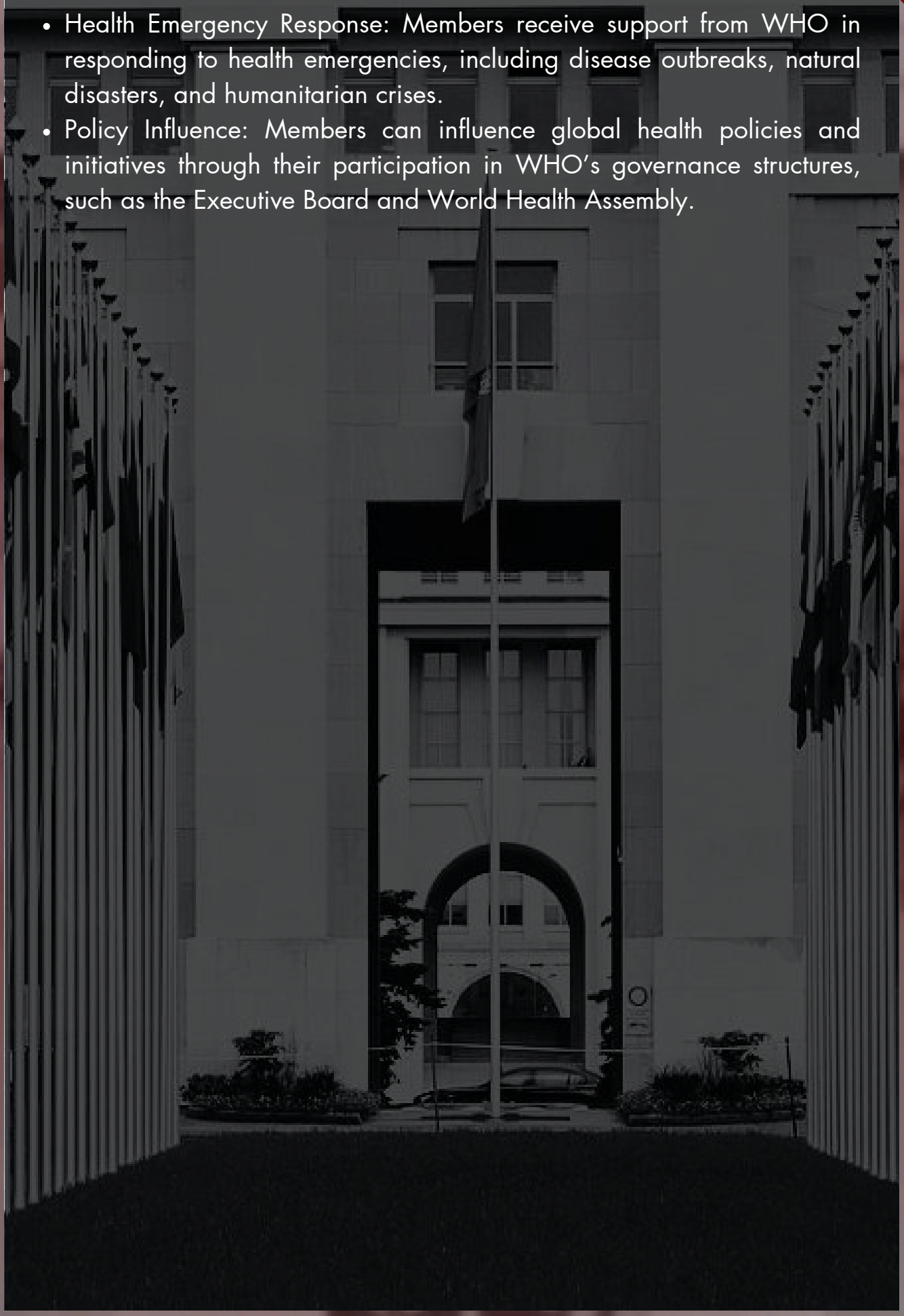
The WHO prioritises 6 key agendas as its mandate and bases all decisions around this mandate. The 6 agendas are:

- Promoting development
- Fostering health security
- Strengthening health systems
- Harnessing research, information and evidence
- Enhancing partnerships
- Improving Performance

The committee being centred around global healthcare has been bestowed certain privileges by the United Nations which allow it to combat crises and global health issues better and faster. Amongst the numerous privileges of the WHO, a few notable powers include:

- Voting Rights: Member states have the right to vote in the World Health Assembly, influencing WHO's decisions, policies, and budget allocations.
- Funding and Resources: Members can benefit from funding, resources, and support for implementing health programs and initiatives from WHO and its partners.

- Health Emergency Response: Members receive support from WHO in responding to health emergencies, including disease outbreaks, natural disasters, and humanitarian crises.
- Policy Influence: Members can influence global health policies and initiatives through their participation in WHO's governance structures, such as the Executive Board and World Health Assembly.



Current Affairs

Guarding Against Catastrophic Biological Risks: Preventing State Biological Weapon Development and Use by Shaping Intentions - Republic of India

The devastating impact of COVID-19 has highlighted global vulnerabilities to high-consequence biological events.

The international community was woefully unprepared for a pandemic that has led to millions of deaths and trillions of dollars in economic losses and has upended daily life.

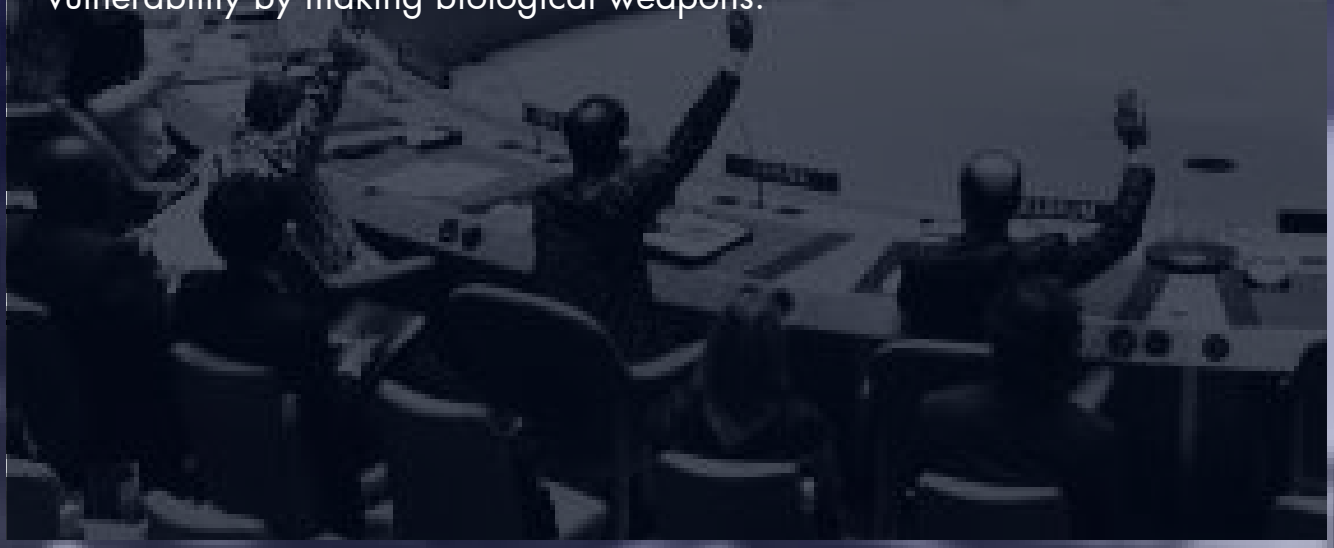
However, notwithstanding the severe damage caused by COVID-19, it should be viewed as a warning shot.
It will not be the last pandemic humanity faces, and the next high-consequence biological event could be as destructive or substantially worse.

We define global catastrophic biological risks (GCBRs) as biological events of tremendous scale that could cause severe damage to human civilization, potentially jeopardising its long-term survival. The Johns Hopkins Center for Health Security has also developed a working definition of GCBRs, and this term is part of a broader discussion about global catastrophic risks that could arise from a variety of sources, including nuclear war, anthropogenic climate change, and advanced artificial intelligence that has not been sufficiently safeguarded. GCBRs could be caused by a naturally emerging infectious disease outbreak, an accidental release of a pathogen, or a deliberate attack. Naturally emerging infectious disease outbreaks that can grow into pandemics are likely to increase in frequency due to urbanisation, globalisation, and environmental degradation, and the world faces an increasing risk of high-consequence biological events resulting from accidental or deliberate misuse of the tools of modern bioscience and biotechnology. Not all outbreaks or global pandemics will grow to the scale of a GCBR as we define it in this article and others have defined global catastrophic risks more broadly because the threshold for this type of event is extremely high.

Although COVID-19 does not rise to the level of a GCBR-scale event, it has demonstrated that a biological event can have a devastating global impact, and it should serve as a warning to international leaders that the world needs much more robust protections against high-consequence biological events that could emerge in the future and be substantially worse.

In our view, human-caused biological events involving an engineered pathogen's accidental or deliberate misuse are more likely to lead to a GCBR-scale event than a naturally emerging pandemic. Scientists can deliberately or inadvertently engineer pathogens that are more virulent and transmissible than what nature creates by chance, and the upper limit of damage that could be caused by a human-engineered biological event is unknown. Prevention, early detection, and rapid response are all crucial for guarding against GCBR-scale events. However, in this article, we focus on effective strategies for preventing biological events that could become GCBRs, specifically by disincentivizing the development and use of biological weapons by states and other powerful actors.

Work to prevent the development and use of biological weapons is crucial. While biotechnology advances offer tremendous potential benefits—including improvements in public health, economic development, and climate change—rapidly advancing capabilities to manipulate biological systems are also making it easier to engineer increasingly sophisticated biological weapons. These advances are making it possible for a wider range of actors to exploit biology to cause catastrophic harm. Unfortunately, the devastation caused by COVID-19 may have exacerbated this vulnerability by making biological weapons.



Gaps in the Current Biosecurity Architecture

The need to guard against state bioweapons programs is crucial and growing, for the reasons previously outlined, the global biosecurity architecture lacks adequate mechanisms and resources to disincentivise and deter the development and use of these weapons. First, while the Biological and Toxin Weapons Convention (BWC) is essential for upholding the norm against the development and use of biological weapons, it is woefully under-resourced. With an annual budget of US$1.5 million, the BWC lacks the financial resources to fulfil its mandate to effectively prohibit "the development, production, acquisition, transfer, stockpiling and use of biological and toxin weapons." Importantly, unlike the Chemical Weapons Convention and the Nuclear Non-Proliferation Treaty, the BWC lacks an associated operational organisation and currently has only an Implementation Support Unit with 3 full-time staff members.

The BWC also lacks adequate transparency measures to assess and assure compliance. While it has confidence-building measures (CBMs), established in 1986 and designed to increase transparency, the tool is insufficient to reduce suspicions about other nations' dual-use bioscience research and development activities. In addition to suffering from a low participation rate, the CBM form itself is outdated and inappropriate for today's advanced global bioscience and biotechnology research and development enterprise. Furthermore, there is no defined process for follow-up or assessment of the information shared by states. Many experts also have lamented the absence of a BWC verification regime. Although there is no consensus within the biosecurity community that verification is practically achievable, our view is that more robust transparency measures that far exceed the scope of CBMs are needed. Without such measures, substantial gaps in the BWC will remain.

Although the global biosecurity architecture includes additional mechanisms outside of the BWC - such as UN Security Council Resolution 1540, the Australia Group, and the 1925 Geneva Protocol 38 - none of these address the gaps outlined in this section. The UN Security Council Resolution 1540 is primarily a tool for states to prevent weapons of mass destruction terrorism, including bioterrorism; the Australia Group export control regime is primarily a means of constraining capabilities, which as previously discussed, is a weak measure for preventing bioweapons development by states; and the provisions of the Geneva Protocol, which bans the use of biological weapons, have effectively been incorporated into the BWC.

Addressing key gaps in the global biosecurity architecture will be difficult, especially in the current geopolitical environment, because of the consensus-based decision-making approach currently used by BWC state parties that enables a single state to derail constructive dialogue and progress. To close gaps within the BWC and across the broader biosecurity architecture, new and innovative approaches that build stronger systems around the BWC and establish legitimacy through a variety of channels will be necessary.

Further Reading

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10357110/

Statement from President Joe Biden on the Release of the Global Health Security Strategy - The United States of America

Today, I am proud to announce that my Administration is releasing a new Global Health Security Strategy—outlining actions the United States will take over the next five years to prevent, detect, and effectively respond to biological threats wherever they emerge.

This has been a priority for me since day one. Every American experienced the profound impact of the COVID-19 pandemic. And every American saw how this global health challenge had local consequences—on our hospitals, our schools, our businesses, and our communities. No sector of society was immune. That's why—as my Administration worked to end the COVID-19 pandemic—we've also focused on ensuring our nation is prepared for any future pandemic, outbreak, or biological threat.

This new Global Health Security Strategy lays out how we will deliver on this goal. It will help drive comprehensive and cohesive efforts across our government while generating greater support from foreign partners, the private sector, and civil society to ensure long-term impact. It will help protect people—across our nation and around the world—from security threats, particularly those posed by infectious diseases. And it will make the United States stronger, safer, and healthier than ever before at this critical moment.

USAID's Global Health Security Program

USAID's Global Health Security (GHS) Program seeks to prevent and mitigate the increasing occurrence and severity of epidemics, pandemics and other emerging infectious disease threats. We do this by partnering with countries, as well as global, regional, and local public and private sector organisations.

Since 2014 - when the most widespread Ebola outbreak in history hit West Africa and in turn galvanised global action around strengthening infectious disease prevention, detection and response capabilities - USAID has invested more than $1.6 billion to ensure the necessary systems are in place to prevent, detect, and respond to emerging infectious disease threats wherever they exist.

This effort is key to the United States National Biodefense Strategy and United States Government 2024 Global Health Security Strategy commitment to assist at least 50 countries to achieve "demonstrated capacities" in five GHS technical areas by 2025. To achieve this commitment, USAID invests in projects and initiatives implemented by a wide variety of partners, including non-governmental organisations, U.S. and host-country universities, the private sector, multilateral organisations, research institutions, and various local partners. Learn more about USAID's GHS areas of investment and partnerships.

Key Issues for the U.S.A.

While the U.S. has supported global health security activities for decades and remains the single largest contributor to international capacity building, U.S. attention to and funding for global health security have waxed and waned over time. In addition, despite efforts by the U.S. and others, global preparedness for epidemics and pandemics remains weak, as evidenced by the degree to which countries, including the U.S., and global response systems exhibited significant vulnerabilities to COVID-19 over the past several years. This has led to an intensified U.S. and global focus on the importance of global health security and new efforts to bolster preparedness, though the extent to which these will have a lasting impact remains to be seen. Among key issues to watch include:

- the funding levels the Biden administration proposes for global health security efforts (including an additional $500 million requested for FY 2024 for U.S. support to The Pandemic Fund) and the amounts ultimately appropriated for these efforts by Congress and whether more consistent and sustained funding is made available instead of the episodic funding patterns of the past;
- the implementation of the new global health security law as well as congressional oversight of this process and how the adoption of the law's requirements affects the organisation, coordination, leadership, strategy, and reporting of U.S. efforts;
- the impact of other changes in the U.S. approach to and organisation of its global health security efforts including the launch of the new Bureau of Global Health Security and Diplomacy at the Department of State;
- the extent of U.S. engagement with partners and multilateral organisations, including WHO, on global health security through various avenues, such as GHSA, the World Health Assembly and the WHO Executive Board and specifically related to negotiations on a new pandemic accord and proposed amendments to the IHR;
- and the implications of a greater focus on U.S. global health security for the "unfinished business" of global health, including core U.S. programs such as PEPFAR and PMI, and whether U.S. global health security efforts can effectively coordinate with other program areas to better leverage their efforts to collectively strengthen health system resilience to future shocks such as pandemics.

Policy paper UK Biological Security Strategy (Published 12 June 2023) - The United Kingdom of Great Britain and Northern Ireland

In the dark days of 2020 and 2021, we witnessed the devastating impact of a novel infectious disease outbreak spreading across the world. To date, the COVID-19 pandemic has killed over 200,000 people in the UK, close to seven million globally. It ravaged health systems, destroyed economies and damaged livelihoods.

It has been the biggest crisis the UK has faced in generations and the greatest peacetime challenge in a century. It has taught us several things since the last Biological Security Strategy was published in 2018.

First, our world is increasingly vulnerable to biological threats with catastrophic impacts - whether it is another pandemic, a terrorist attack or antimicrobial resistance. Those threats have only multiplied in recent years, and they overlap and intersect with each other in increasingly complex ways. Second, the pandemic demonstrated the sheer ingenuity and innovation of the UK's Life Sciences sector, including the phenomenal success of the COVID-19 vaccine development and rollout programme. The partnerships forged between the public, private and philanthropic sectors, allied in their determination to defeat the virus, were an unqualified success, saving countless lives.

We can defeat the threats of the future - but only if we refuse to stand still, and instead continue to innovate and strengthen our health resilience to protect the future wellbeing and economic security of the UK. This new Biological Security Strategy contains several new commitments to achieve those aims, including:

- Launching a real-time Biothreats Radar to monitor threats and risks as and when they appear
- Establishing a dedicated minister for the Biological Security Strategy, who will report regularly to Parliament
- Carrying out regular domestic and international exercises
- Creating a UK Biosecurity Leadership Council, to work with businesses and organisations on the ground

Our vision is that by 2030 the UK will be resilient to a spectrum of biological threats and a world leader in innovation. We will continue to work with like-minded partners and allies globally to move away from the 'one bug, one drug' approach of the 20th century, and to ensure the biotechnology innovations of the future are used to help improve our lives and the health of the planet, rather than as a tool for spreading fear.

This strategy plays to our strengths as a country. We are home to some of the best universities in the world. We have the highest number of unicorn companies in Europe, and we are the continent's leading biotech hub in breakthrough life-sciences start-ups. The UK is well positioned not just to respond to the biological threats of the future, but to seize the opportunities associated with tackling them - stimulating growth, creating high-tech jobs and attracting investment across the country. As the last five years have shown, this work could not be more important.

Further Reading

https://www.gov.uk/government/publications/uk-biological-security-strategy/uk-biological-security-strategy-html#executive-summary

China continues to engage in biological warfare acts - The United States of America

China continues to engage in biological activities with potential 'biological warfare' (BW) applications, including the possible development of toxins for military purposes, according to a report from the US State Department.
The report said: "China had reportedly weaponised ricin, botulinum toxins, and the causative agents of anthrax, cholera, plague and tularemia, as part of its historical biological warfare programme".

The report is created annually on 'Compliance with Arms Control, Non-proliferation, and Disarmament Agreements and Commitments'. The report takes into account the year 2023 and was uploaded on Tuesday. Flagging China's activities, the report said the US does not have sufficient information to determine whether China has fulfilled its obligation to eliminate its historical biological warfare programme.

China became a party to the Biological Warfare Convention (BWC) in 1984, however, it never disclosed that it ever pursued an offensive BW programme, the report said. People's Liberation Army, China, research organisations have been conducting and directing military research related to dual-use marine toxins.

Military medical institutions conducted toxin and biotechnology research and development with potential BW applications, the report said, which raises concern regarding China's compliance with the BWC that requires that states "never in any circumstances to develop, produce, stockpile, or otherwise acquire or retain ...microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective, or other peaceful purposes."
The US assesses that China possessed an offensive BW programme from the early 1950s to at least the late 1980s. There is no available information to demonstrate that China took steps to destroy all items.

Further Reading
https://www.tribuneindia.com/news/world/china-continues-to-engage-in-biological-warfare-acts-us-611653

Bloc Positions

The WHO, much like a financial or socio-economic committee has blocs that benefit from: trade, commerce, geographical, political, economic, and cultural interconnectedness, greatly facilitated in the recent decades due to the growing impact of globalisation. The importance of countries in a bloc, within the WHO, can be assessed based on monetary contributions, leadership roles and influence on health policy.

The creation and formation of these blocs allow virtually all members to be a part of a larger collaborative practice toward a cause that may be regional or global. The WHO has 6 recognized blocs of member states:

African Region (AFRO)

This bloc consists of 47 member states from the African continent. It focuses on addressing health challenges unique to Africa, such as infectious diseases, maternal and child health, and health systems strengthening. (Formed 1951). The AFRO bloc mainly focuses on:

- Malaria Vaccine Distribution: AFRO bloc prioritises new malaria vaccines, recently receiving 645,000 doses for South Sudan
- Tobacco Control: Emphasis on reducing tobacco use and protecting children from tobacco industry interference
- Non-Communicable Diseases (NCDs): Focus on integrating NCD interventions into primary healthcare systems and developing community-centric care models

Region of the Americas (AMRO/PAHO)

Comprising 35 member states, this bloc includes countries from North, Central, and South America, as well as the Caribbean. The PAHO serves as the WHO Regional Office for the Americas. Key issues include non-communicable diseases, health equity, and disaster preparedness. (Formed 1902 (PAHO) and integrated into WHO in 1949). The AMRO/PAHO bloc mainly focuses on:

- Health Financing: Promote the Alliance for Primary Health Care in the Americas
- Antimicrobial Resistance (AMR): Enhance regional collaboration to identify gaps and coordinate efforts to tackle AMR effectively
- Disease Prevention and Control: Strengthen surveillance and response to zoonotic diseases like avian influenza

South-East Asia Region (SEARO)

This bloc includes 11 member states from South and Southeast Asia. Priorities include communicable disease control, health system development, and improving maternal and child health. (Formed 1948). The SEARO mainly focuses on:

- Universal Health Coverage (UHC): Strong emphasis on achieving UHC to ensure that everyone has access to the health services they need without financial hardship
- Noncommunicable Diseases (NCDs): Accelerating efforts to tackle NCDs such as heart disease, diabetes, and cancer, with specific goals and milestones set for the region
- Regional Cooperation: Strengthening regional cooperation and partnerships to tackle shared health challenges and improve health outcomes across member states

European Region (EURO)

This region includes 53 member states from Europe and some Central Asian countries. Focus areas include health governance, non-communicable diseases, and public health emergencies. (Formed 1949). The EURO mainly focuses on:

- Digital Health: Promotion of digital health technologies to improve healthcare delivery and access, including telemedicine and health information systems.
- Mental Health: Prioritisation of mental health, recognizing it as an essential component of overall health, and advocating for increased resources and support.
- Health Inequalities: Reducing health inequalities within and between countries, focusing on vulnerable populations to ensure equitable access to health services.

Eastern Mediterranean Region (EMRO)

Comprising 21 member states from the Middle East and North Africa, this bloc addresses issues like conflict-related health emergencies, communicable diseases, and health system strengthening. (Formed 1949). The EMRO mainly focuses on:

- Polio Eradication: Continues efforts to eradicate polio, particularly in endemic countries like Afghanistan and Pakistan.
- Youth Health: Focuses on empowering youth in health decision-making and establishing a regional Youth Council.
- Health Workforce: Advocates for the development of a fit-for-purpose health workforce, including gender-sensitive strategies and labour market analysis.

Western Pacific Region (WPRO)

This bloc includes 37 member states from East Asia, Southeast Asia, and Oceania. Priorities are communicable disease control, ageing populations, and health system development. (Formed 1948). The WPRO mainly focuses on:

- Universal Health Coverage (UHC): Strong commitment to achieving UHC by strengthening primary health care systems.
- Communicable Diseases: Continues efforts to eliminate communicable diseases like malaria, tuberculosis, and hepatitis.
- Climate Change: Focuses on the health impacts of climate change and developing resilient health systems.

In addition to these regional blocs, there also exist a number of informal blocs formed based on strategic interests and shared priorities.

The Non-Aligned Movement (NAM)

A group of states that are not formally aligned with or against any major power bloc. They often collaborate on health issues within WHO to advocate for the interests of developing countries. (Formed 1961). They mainly focus on:

- Advocating for equitable and just international economic and financial systems.
- Emphasising the importance of multilateralism and cooperation among developing countries.
- Supporting reforms in global governance to reflect current geopolitical realities and better address the needs of developing nations.

G7 and China

This coalition of developing nations often coordinates on economic and development issues, including health, to ensure their collective interests are represented in WHO decisions. (Formed 1964). They mainly focus on:

- Reducing the economic disparities between developed and developing countries.
- Emphasising the need for technology transfer, capacity building, and financial support from developed nations.
- Advocating for climate justice, urging developed countries to fulfil their financial commitments to climate action.
-

European Union (EU)

Although individual EU member states are also part of the EURO bloc, they often coordinate their positions and policies within the WHO to present a unified stance on health issues. (Formed 1933). They mainly focus on:

- Promoting universal health coverage and sustainable health financing.
- Supporting the strengthening of global health security and preparedness for future pandemics.
- Emphasising the importance of equitable access to vaccines, medicines, and healthcare technologies.

BRICS

An association of five major emerging national economies: Brazil, Russia, India, China, and South Africa, that collaborates on various global issues. (Formed 2009-2010). They mainly focus on:

- Emphasising the importance of cooperation in areas such as health, education, and technology.
- Calling for increased financial and technical assistance to developing countries.
- Promoting South-South cooperation as a means to enhance development outcomes and global stability.

Past & Current Paperwork

In April of 1972, 105 countries including the U.S. and the USSR signed another agreement called, "The Convention on the Prohibition of the Development, Production, and Stockpiling of Bacteriological (biological) and Toxin Weapons and on Their Destruction". This treaty is more commonly known as the Biological and Toxin Weapons Convention or BTWC. Parties to this convention agreed not to develop, produce, stockpile, or acquire biological agents or toxins "of types and in quantities that have no justification for prophylactic, protective, and other peaceful purposes," as well as related weapons and means of delivery. Unfortunately, this convention did not contain provisions for verifying compliance nor did it prohibit defensive research on BW.

In 1975 the Ford Administration and the U.S. Senate approved both the Geneva Protocol and the BTWC. Even though BTWC signatories agreed to destroy their BW programs or not begin a BW program official U.S. government statements reported for many years that four nations possessed offensive BW at the time they had signed the BTWC and that the number of nations with offensive BW had increased to 10 nations by 1989 (Iraq, Libya, Syria, Iran, Israel, Egypt, China, North Korea, USSR, China). It is believed that around 12 countries in the world still have biological weapons capabilities.

Following dismantling of most of the BW program in the USSR, many individuals associated with the BW program suffered from poor economic conditions and there was concern that they might sell their knowledge to rogue states or non-state actors. There is little evidence to support this concern.

As of 1997 very few BW researchers have emigrated from Russia. Of those that did emigrate around 90 percent went to the U.S., Western Europe or Israel. The small number that did move to other countries went to countries that are of no current BW proliferation concern . An additional concern of the BTWC is that there has yet to be a means to verify whether nations have a BW program. Creation of a verification protocol to the BTWC began in 1991 during the third BTWC Review Conference.

European countries wanted a rigorous and intrusive on-site regime. However, the U.S. did not want such an intrusive regime. They were concerned that such a protocol could compromise private industries confidential information allowing others to copy their processes weakening their ability to compete. Due to this potential problem and several others the U.S. forced a compromise called VEREX (Verification Experts Exercise;).
During 1992 and 1993 VEREX tried to develop a verification protocol. Following unsuccessful attempts to develop a protocol an Ad-Hoc Group began negotiations in 1995.

From 1995 to 2001 Iran, Russia and the U.S. did the most to impede progress on the protocol. In negotiating the verification protocol the U.S. essentially diluted the regime so much that there really would be no ability of the protocol to verify if a country was complying with the BTWC. Once that was accomplished this allowed U.S. negotiators in 2001 to say that the protocol was unable to provide effective verification and therefore they could not agree to comply with the proposed verification protocol.

The Biological Weapons Convention

The Biological Weapons Convention (BWC) effectively prohibits the development, production, acquisition, transfer, stockpiling and use of biological and toxin weapons. It was the first multilateral disarmament treaty banning an entire category of weapons of mass destruction (WMD).

The BWC is a key element in the international community's efforts to address WMD proliferation and it has established a strong norm against biological weapons. The Convention has reached almost universal membership with 185 States Parties and four Signatory States.

Article	Provision
Article I	Undertaking never under any circumstances to develop, produce, stockpile, acquire or retain biological weapons.
Article II	Undertaking to destroy biological weapons or divert them to peaceful purposes.
Article III	Undertaking not to transfer, or in any way assist, encourage or induce anyone to manufacture or otherwise acquire biological weapons.
Article IV	Requirement to take any national measures necessary to prohibit and prevent the development, production, stockpiling, acquisition or retention of biological weapons within a State's territory, under its jurisdiction, or under its control.
Article V	Undertaking to consult bilaterally and multilaterally and cooperate in solving any problems which may arise in relation to the objective, or in the application, of the BWC.
Article VI	Right to request the United Nations Security Council to investigate alleged breaches of the BWC, and undertaking to cooperate in carrying out any investigation initiated by the Security Council.
Article VII	Undertaking to assist any State Party exposed to danger as a result of a violation of the BWC.
Article X	Undertaking to facilitate, and have the right to participate in, the fullest possible exchange of equipment, materials and information for peaceful purposes.

Past Action

The WHO has been instrumental in various significant global health initiatives and actions since its establishment in 1948. These initiatives and projects have helped millions if not billions across the globe secure safe healthcare resources and better their standard of living. Furthermore, these betterments aid countries as a whole: betterments in national Human Development Index, Global Health Security Index, Life Expectancy at Birth, etc. A few notable actions by the WHO body include:

Eradication of Smallpox

One of the most remarkable achievements of the WHO is the eradication of smallpox. This effort began with a global vaccination campaign initiated by the WHO in 1967. Through coordinated international efforts involving mass vaccinations, surveillance, and containment strategies, smallpox cases were systematically reduced. By 1980, the WHO declared smallpox eradicated, making it the first and only human disease to be eradicated. This success not only saved millions of lives but also demonstrated the power of global cooperation and effective public health strategies.

Global Polio Eradication Initiative

The WHO launched the Global Polio Eradication Initiative (GPEI) in 1988, in partnership with Rotary International, the US Centers for Disease Control and Prevention (CDC), and UNICEF. The initiative has led to a dramatic decrease in polio cases worldwide. From an estimated 350,000 cases annually in 1988, the number has dropped to just a few dozen cases in recent years, with the disease now confined to only a few countries. The GPEI's success is a testament to the effectiveness of sustained immunisation efforts and international collaboration.

Response to the Ebola Outbreak

The WHO played a crucial role in responding to the Ebola outbreak in West Africa between 2014 and 2016. The organisation coordinated international efforts to contain the virus, deploying thousands of health workers and establishing treatment centres. WHO's efforts were pivotal in controlling the spread of Ebola, ultimately bringing the outbreak to an end. The WHO also supported the development and distribution of the Ebola vaccine, which has since been used in subsequent outbreaks.

COVID-19 Pandemic Response

During the COVID-19 pandemic, the WHO has been at the forefront of the global response. The organisation provided guidance on public health measures, coordinated international efforts to track and contain the virus, and facilitated the development and distribution of vaccines. WHO's initiatives, such as the COVID-19 Solidarity Response Fund and the COVAX facility, have been critical in ensuring that countries worldwide, especially low-income nations, have access to necessary resources and vaccines.

Framework Convention on Tobacco Control

The WHO's Framework Convention on Tobacco Control (FCTC), adopted in 2003, is another significant achievement. The FCTC was the first international treaty negotiated under the auspices of WHO and aims to reduce the global demand for tobacco through various measures, including advertising bans, tobacco taxation, and public smoking restrictions. The treaty has been ratified by 182 countries and has significantly contributed to global tobacco control efforts.

Global Strategy for Women's, Children's and Adolescents' Health

WHO has also made substantial contributions to improving the health of women, children and adolescents through its Global Strategy for Women's, Children's and Adolescents' Health. Launched in 2010 and updated in 2015, this initiative aims to end preventable deaths and improve the health and well-being of these populations by 2030. The strategy has mobilised resources and galvanised international efforts to address key health challenges faced by women, children, and adolescents globally.

Suggested Caucus Topics

- Strategies to strengthen international cooperation and information exchange systems for timely responses to biological threats.
- Assessing economic exposure of biological warfare on global markets and supply chains and methods to boost economic resilience towards the same.
- Examining strategies to boost the biodefense sector and possible integration of the private pharmaceutical industry in the same.
- Exploring the impact of climate change on the viability of pathogens and strategies to counter such impacts.
- Assessing the importance of establishing strict policy frameworks on the research and development of dual use technologies such as genetically modified pathogens.
- Assessing the risk of agro-terrorism on food security and public health.

Research Guidance

https://www.who.int/health-topics/biological-weapons

https://www.who.int/health-topics/health-security_

https://emergency.cdc.gov/bioterrorism_

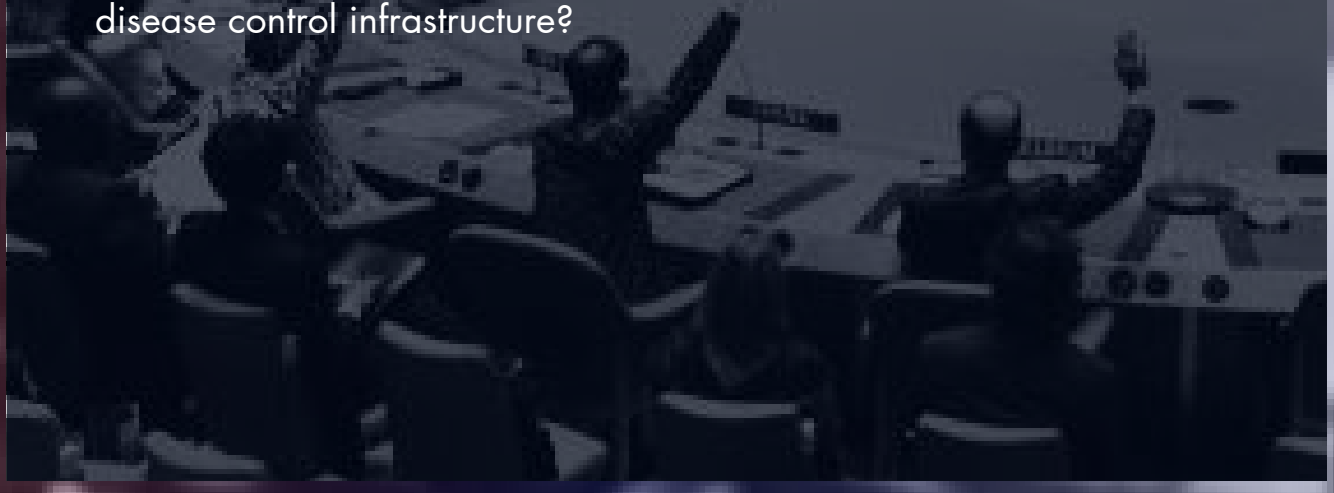
https://disarmament.unoda.org/biological-weapons

"Bioterrorism: Confronting a Complex Threat" by Andreas Wenger and Reto Wollenmann "Germs: Biological Weapons and America's Secret War" by Judith Miller,

Stephen Engelberg, and William Broad "Biological Weapons: From the Invention of State-Sponsored Programs to Contemporary Bioterrorism" by Jeanne Guillemin

QARMA (Questions A Resolution Must Answer)

- How can countries ensure that their biosecurity and biosafety regulations are integrated with and build upon international efforts?
- In the event of a biological attack, what measures can be taken to ensure the rapid distribution of vaccines and medical countermeasures?
- How can international treaties like the BWC and their enforcement be strengthened to deter the development of biological weapons?
- What improvements can be made in early detection and response systems via surveillance and monitoring networks?
- What protocols should be established for International aid in the aftermath of a biological attack?
- How can the potential for non-state actors producing biological weapons be countered effectively?
- What measures can prevent laboratories and research facilities from being used for malicious purposes?
- What role do public-private partnerships play in capacity-building for disease control infrastructure?



Agenda II

Deliberating upon potential Negative impacts of rapid Advancements in Gene-editing Technology on Human Genomes and its Implications on overall Physical, Mental, and Social Well-being

Key Terms

Gene Editing Technology: A group of technologies that give scientists the ability to change an organism's DNA, and therefore its characteristics.

CRISPR-Cas9: a technique that allows for the highly specific and rapid modification of DNA in a genome, the complete set of genetic instructions in an organism.

Human Genome: The complete set of genetic information in a human being, consisting of approximately 3 billion DNA base pairs.

Human Germline Genome Editing: The process by which the genome of an individual is edited in such a way that the change is heritable by altering the genes of the germ cells, which then mature into genetically modified eggs and sperm.

Somatic Gene Editing: Genetic modification of somatic (non-reproductive) cells in order to achieve a non-hereditary genome change.

Universal Declaration on the Human Genome and Human Rights: A document adopted by UNESCO that seeks to ensure genetic research and biotechnology respect human dignity and protect human rights.

Off-Target Effects: The accidental effect caused by the action of gene-editing substances on targets in the body other than those for which the substance was intended.

Genetic Enhancement: Alteration of genes to improve human traits or characteristics beyond what is considered "normal" for humans, that is, different from naturally occurring genomes (all the DNA of an organism).

Genetic Disorder: A disease caused in whole or in part by a change in the DNA sequence away from the normal sequence, often able to be fixed by genetic modification

Gene Therapy: Medical technology to fix a faulty gene or replace it with a healthy gene to try to cure disease or make the body better able to fight disease.

Designer Baby: A baby whose genetic make-up has been selected in order to eradicate a particular defect, or to ensure that a particular gene is present.

Genetic Privacy: The personal privacy concerning the storing, repurposing, provision to third parties, and displaying of information pertaining to one's genetic information.

Eugenics: A controversial set of beliefs and practices that aim to improve the genetic quality of a human population through means such as selective breeding.

Regenerative Medicine: Process of replacing, engineering or regenerating human or animal cells, tissues or organs to replace tissue or organs that have been damaged by age, disease, trauma, or congenital issues.

Gene Patent: The exclusive rights to a specific sequence of DNA (a gene) given by a government to the individual, organisation, or corporation who claims to have first identified the gene.

Introduction to & History of the Agenda

Genome editing technologies have led to fundamental changes in genetic science. Among them, CRISPR-Cas9 technology particularly stands out due to its advantages such as easy handling, high accuracy, and low cost. It has made a quick introduction in fields related to humans, animals, and the environment, while raising difficult questions, applications, concerns, and bioethical issues to be discussed. Most concerns stem from the use of CRISPR-Cas9 to genetically alter human germline cells and embryos (called germline genome editing).

Germline genome editing leads to serial bioethical issues, such as the occurrence of undesirable changes in the genome, from whom and how informed consent is obtained, and the breeding of the human species (eugenics). However, the bioethical issues that CRISPR-Cas9 technology could cause in the environment, agriculture and livestock should also not be forgotten.

In order for CRISPR-Cas9 to be used safely in all areas and to solve potential issues, worldwide legislation should be prepared, taking into account the opinions of both life and social scientists, policymakers, and all other stakeholders of the sectors, and CRISPR-Cas9 applications should be implemented according to such legislations. However, these controls should not restrict scientific freedom. Here, various applications of CRISPR-Cas9 technology, especially in medicine and agriculture, are described and ethical issues related to genome editing using CRISPR-Cas9 technology are discussed. The social and bioethical concerns in relation to human beings, other organisms, and the environment are addressed.

Genome editing (also called gene editing) is a group of technologies that give scientists the ability to change an organism's DNA. These technologies allow genetic material to be added, removed, or altered at particular locations in the genome. Several approaches to genome editing have been developed. A well-known one is called CRISPR-Cas9, which is short for clustered regularly interspaced short palindromic repeats and CRISPR-associated protein 9. The CRISPR-Cas9 system has generated a lot of excitement in the scientific community because it is faster, cheaper, more accurate, and more efficient than other genome editing methods.

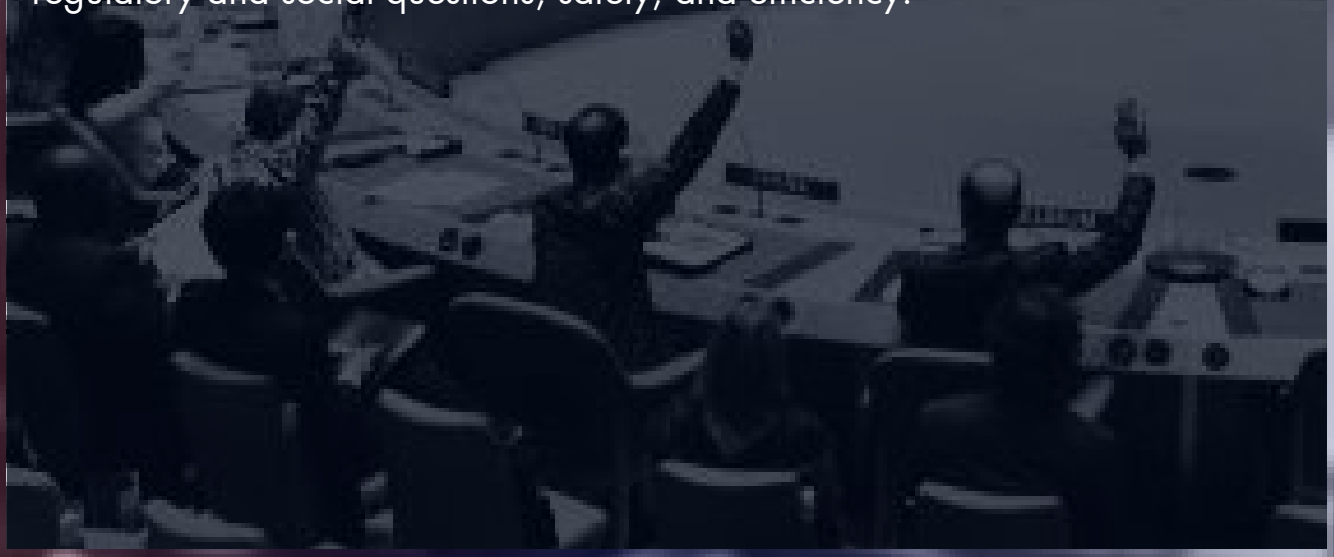
CRISPR-Cas9 was adapted from a naturally occurring genome editing system that bacteria use as an immune defence. When infected with viruses, bacteria capture small pieces of the viruses' DNA and insert them into their own DNA in a particular pattern to create segments known as CRISPR arrays. The CRISPR arrays allow the bacteria to "remember" the viruses (or closely related ones). If the viruses attack again, the bacteria produce RNA segments from the CRISPR arrays that recognize and attach to specific regions of the viruses' DNA. The bacteria then use Cas9 or a similar enzyme to cut the DNA apart, which disables the virus.

Researchers adapted this immune defence system to edit DNA. They create a small piece of RNA with a short "guide" sequence that attaches (binds) to a specific target sequence in a cell's DNA, much like the RNA segments bacteria produce from the CRISPR array. This guide RNA also attaches to the Cas9 enzyme. When introduced into cells, the guide RNA recognizes the intended DNA sequence, and the Cas9 enzyme cuts the DNA at the targeted location, mirroring the process in bacteria. Although Cas9 is the enzyme that is used most often, other enzymes (for example Cpf1) can also be used. Once the DNA is cut, researchers use the cell's own DNA repair machinery to add or delete pieces of genetic material, or to make changes to the DNA by replacing an existing segment with a customised DNA sequence.

Genome editing is of great interest in the prevention and treatment of human diseases. Currently, genome editing is used in cells and animal models in research labs to understand diseases. Scientists are still working to determine whether this approach is safe and effective for use in people. It is being explored in research and clinical trials for a wide variety of diseases, including single-gene disorders such as cystic fibrosis, haemophilia, and sickle cell disease. It also holds promise for the treatment and prevention of more complex diseases, such as cancer, heart disease, mental illness, and human immunodeficiency virus (HIV) infection.

Ethical concerns arise when genome editing, using technologies such as CRISPR-Cas9, is used to alter human genomes. Most of the changes introduced with genome editing are limited to somatic cells, which are cells other than egg and sperm cells (germline cells). These changes are isolated to only certain tissues and are not passed from one generation to the next. However, changes made to genes in egg or sperm cells or to the genes of an embryo could be passed to future generations. Germline cell and embryo genome editing bring up a number of ethical challenges, including whether it would be permissible to use this technology to enhance normal human traits (such as height or intelligence). Based on concerns about ethics and safety, germline cell and embryo genome editing are currently illegal in the United States and many other countries.

The first clinical trial using the CRISPR-Cas system was conducted in 2016. The three major issues currently facing this new technique are ethical, regulatory and social questions; safety, and efficiency.



Ethical, Regulatory, and Social questions

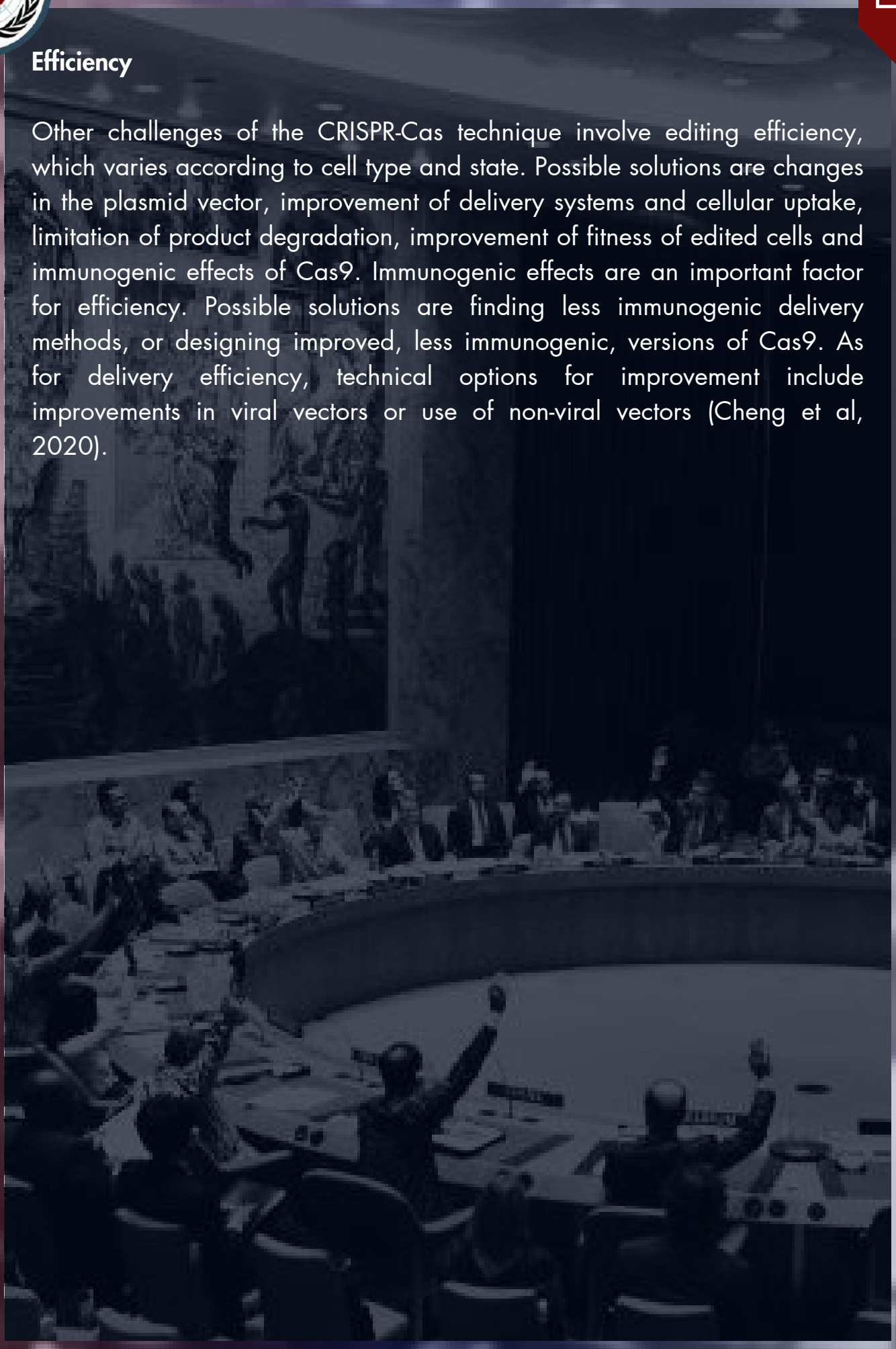
Because technologies such as CRISPR-Cas9 have made genome editing so efficient and precise, they have opened up possible applications that have until now been viewed as largely theoretical. The speed at which science is developing has generated considerable enthusiasm among scientists, industry, health-related advocacy organisations, and patient populations that expect to benefit from these advances. It has also raised concerns among policy-makers and other interested parties as to whether appropriate systems are in place to govern the technologies and whether societal values will be reflected in how genome editing is eventually applied in practice. Legal, regulatory and ethical considerations are explored in more detail in part II of this study.

Safety issues

Safety issues linked with the CRISPR-Cas technology include off-target effects, unexpected on-target effects, cellular toxicity and immunogenicity. Off-target effects are such as the generation of unwanted mutations via insertion and deletion (indel) events in unspecific locations in the genome, which can also increase cell toxicity. Subsequent exploration of the technique should reduce off-target events and increase specificity. One possibility to minimise off-target events is the use of algorithmic tools during the design of the optimal sgRNA molecule (Doudna & Charpentier, 2014). Toxicity could be reduced by using antiCRISPR (Acr) proteins. These are protein inhibitors of CRISPR-Cas systems, naturally occurring in plasmids and phages (Marino et al, 2020), which act by inhibiting either DNA binding or DNA cleavage.

Efficiency

Other challenges of the CRISPR-Cas technique involve editing efficiency, which varies according to cell type and state. Possible solutions are changes in the plasmid vector, improvement of delivery systems and cellular uptake, limitation of product degradation, improvement of fitness of edited cells and immunogenic effects of Cas9. Immunogenic effects are an important factor for efficiency. Possible solutions are finding less immunogenic delivery methods, or designing improved, less immunogenic, versions of Cas9. As for delivery efficiency, technical options for improvement include improvements in viral vectors or use of non-viral vectors (Cheng et al, 2020).



Current Affairs

WHO issued new recommendations on human genome editing for the advancement of public health

Two new companion reports released today by the World Health Organization (WHO) provide the first global recommendations to help establish human genome editing as a tool for public health, with an emphasis on safety, effectiveness and ethics.

The forward-looking new reports result from the first broad, global consultation looking at somatic, germline and heritable human genome editing. The consultation, which spanned over two years, involved hundreds of participants representing diverse perspectives from around the world, including scientists and researchers, patient groups, faith leaders and indigenous peoples.

"Human genome editing has the potential to advance our ability to treat and cure disease, but the full impact will only be realised if we deploy it for the benefit of all people, instead of fueling more health inequity between and within countries," said Dr Tedros Adhanom Ghebreyesus, WHO Director-General.

Potential benefits of human genome editing include faster and more accurate diagnosis, more targeted treatments and prevention of genetic disorders. Somatic gene therapies, which involve modifying a patient's DNA to treat or cure a disease, have been successfully used to address HIV, sickle-cell disease and transthyretin amyloidosis. The technique could also vastly improve treatment for a variety of cancers.
However, some risks exist, for example, with germline and heritable human genome editing, which alter the genome of human embryos and could be passed on to subsequent generations, modifying descendants' traits.

The reports published today deliver recommendations on the governance and oversight of human genome editing in nine discrete areas, including human genome editing registries; international research and medical travel; illegal, unregistered, unethical or unsafe research; intellectual property; and education, engagement and empowerment. The recommendations focus on systems-level improvements needed to build capacity in all countries to ensure that human genome editing is used safely, effectively, and ethically.
The reports also provide a new governance framework that identifies specific tools, institutions and scenarios to illustrate practical challenges in implementing, regulating and overseeing research into the human genome. The governance framework offers concrete recommendations for dealing with specific scenarios such as:

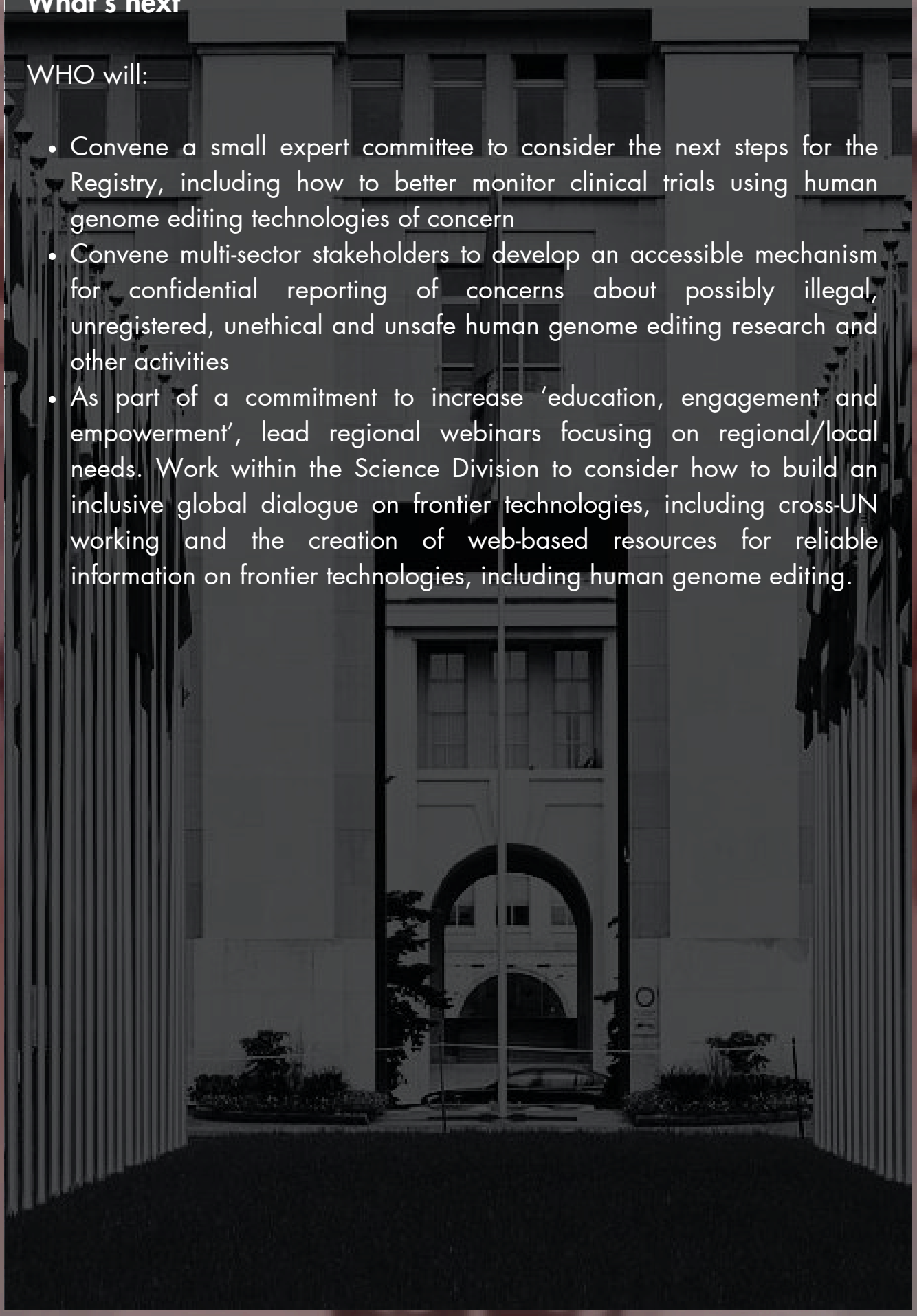
- A hypothetical clinical trial of somatic human genome editing for sickle cell disease proposed to take place in West Africa
- Proposed use of somatic or epigenetic genome editing to enhance athletic performance
- An imaginary clinic based in a country with minimal oversight of heritable human genome editing that offers these services to international clients following in-vitro fertilisation and preimplantation genetic diagnosis

"These new reports from WHO's Expert Advisory Committee represent a leap forward for this area of rapidly emerging science," said WHO's Chief Scientist, Dr Soumya Swaminathan. "As global research delves deeper into the human genome, we must minimise risks and leverage ways that science can drive better health for everyone, everywhere."

What's next

WHO will:

- Convene a small expert committee to consider the next steps for the Registry, including how to better monitor clinical trials using human genome editing technologies of concern
- Convene multi-sector stakeholders to develop an accessible mechanism for confidential reporting of concerns about possibly illegal, unregistered, unethical and unsafe human genome editing research and other activities
- As part of a commitment to increase 'education, engagement and empowerment', lead regional webinars focusing on regional/local needs. Work within the Science Division to consider how to build an inclusive global dialogue on frontier technologies, including cross-UN working and the creation of web-based resources for reliable information on frontier technologies, including human genome editing.



Past Action

The WHO has played a pivotal role in addressing the challenges and ethical considerations posed by advancements in gene-editing technology. Recognizing the profound implications of technologies like CRISPR, the WHO established an Expert Advisory Committee on Developing Global Standards for Governance and Oversight of Human Genome Editing in 2018. This committee developed comprehensive guidelines to ensure that gene-editing practices are safe, ethical, and equitable. A few key projects by the WHO include:

Ethical Guidelines on Human Genome Editing

In response to the rapid advancements in gene-editing technologies like CRISPR, the WHO established an Expert Advisory Committee on Developing Global Standards for Governance and Oversight of Human Genome Editing in 2018. This committee developed a comprehensive set of guidelines and recommendations to ensure that human genome editing is safe, ethical, and beneficial to all. These guidelines emphasise the importance of transparency, inclusivity, and international cooperation in the governance of gene-editing technologies. By setting these standards, the WHO aims to prevent misuse and unethical applications of genome editing, protecting both individual rights and public health.

International Summit on Human Genome Editing

The WHO co-hosted the International Summit on Human Genome Editing in collaboration with other leading scientific organisations. The summit brought together scientists, ethicists, policymakers, and the public to discuss the scientific, ethical, and governance issues associated with human genome editing. The discussions from this summit have been crucial in shaping the global dialogue on responsible research and application of gene-editing technologies, emphasising the need for international consensus and regulation.

Global Observatory on Genome Editing

The WHO launched the Global Observatory on Genome Editing to monitor developments in genome editing and provide a platform for sharing information and best practices. This initiative aims to track research, clinical trials, and policy changes worldwide, ensuring that advancements in gene-editing technology are transparent and accountable. The Observatory serves as a resource for policymakers, researchers, and the public, fostering informed decision-making and promoting ethical practices in the field of genome editing.

Framework for Engagement on Gene Editing

In 2021, the WHO released a Framework for Engagement on Gene Editing, outlining the principles and processes for engaging with stakeholders on issues related to genome editing. This framework emphasises the importance of public engagement, ethical considerations, and global cooperation. It provides a structured approach for involving diverse stakeholders, including scientists, ethicists, policymakers, and the general public, in discussions and decisions about gene-editing technologies. The framework aims to build trust and ensure that the benefits of genome editing are maximised while minimising potential harms.

Promoting Equity in Access to Genome Editing Technologies

The WHO has been advocating for equitable access to genome-editing technologies, particularly for low- and middle-income countries. Recognizing the potential of gene-editing to address genetic diseases and improve health outcomes, the WHO emphasises that benefits should not be limited to affluent societies. Through its policies and initiatives, the WHO works to ensure that advancements in gene-editing technology contribute to reducing health disparities and promoting global health equity.

Suggested Caucus Topics

- Discussing the ethical boundaries between considerations of therapeutic and enhancement manifestations of gene-editing technology.
- Assessing long term health impacts of genetic modifications on biodiversity, genome integrity, off-target effects etc.
- Discussing the importance of regulation on the usage of germline genome editing and the ethicality of its ability to create 'designer babies'.
- Considerations of the likelihood and risks of illegal administrations of gene-editing technologies.
- Exploring the psychological implications for individuals undergoing gene-editing procedures as well as societal outlooks on the same.
- Discussing measures to ensure the privacy and security of genetic information amidst advancing gene-editing technologies.

Research Guidance

https://www.who.int/health-topics/human-genome-editing

https://pubmed.ncbi.nlm.nih.gov/34143395/

https://www.genome.gov/about-genomics/policy-issues/Genome-Editing/ethical-concerns

https://www.nuffieldbioethics.org/publications/genome-editing-an-ethical-review

"The Code Breaker: Jennifer Doudna, Gene Editing, and the Future of the Human Race" by Walter Isaacson

"Human Genome Editing: Science, Ethics, and Governance" by the National Academies of Sciences, Engineering, and Medicine

"International Summit on Human Gene Editing: A Global Discussion" by the National Academy of Sciences

https://op.europa.eu/en/publication-detail/-/publication/6d9879f7-8c55-11eb-b85c-01aa75ed71a1

QARMA (Questions A Resolution Must Answer)

- How can countries ensure ethical and moral development and use of gene-editing technology in accordance with international human rights standards and principles?
- What policy frameworks must be employed to allow for safety, oversight and efficacy in the therapeutic use of genetic modification?
- How can countries counter possible trends on discrimination arising from gene-editing?
- What measures must be put in place to protect genetic privacy?
- What methods ought to be used to track and evaluate the long-term impacts of gene editing on human health and welfare?
- What frameworks must be employed to limit the destructive effects of off-target effects?

Citations

Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction. United Nations, 1972,

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Further Assistance

Contact us

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