



CANMUN

Canada Model United Nations

— World Health Organization —

www.canmun.com

Diplomacy for Democracy | Diplomatie pour la Démocratie

Table of Contents

CANMUN Code of Conduct.....	3
Director's Letter.....	6
Introduction.....	7
Definitions and Abbreviations.....	8
Topic A: Antibiotic Resistance.....	9
Historical Overview.....	9
Previous UN Involvement.....	10
Topics of Discussion.....	11
Sources of Antibiotic Resistance.....	11
Animal Industries.....	12
Overuse, Misuse, and Transparency of Antibiotics.....	13
Rise of Superbugs.....	13
The Decline of Effective Antibiotics.....	14
Case Study: Peru.....	15
Conclusion.....	15
Questions to Consider.....	16
Topic B: Neglected Tropical Diseases.....	17
Historical Overview.....	17
Previous UN Involvement.....	18
Topics of Discussion.....	19
Causes of Neglect and Impacted Communities.....	19
Discrimination and Stigma.....	21
Mass Drug Administrations and Barriers.....	22
Case Study: Timor-Leste.....	23
Conclusion.....	24
Questions to Consider.....	24
Bibliography.....	26

CANMUN Code of Conduct

Introduction

The conduct of attending delegates at the 2024 Canadian Model United Nations (hereby referred to as “CANMUN 2024” or “the conference”) reflects on their institution and the conference. To ensure a safe, professional and fun conference for all those in attendance, including but not limited to delegates, faculty advisors, conference staff and hotel staff, the following Code of Conduct has been formulated. Please ensure that you thoroughly read through this document, as all attendees are expected to abide by these policies during the duration of the conference (including but not limited to committee sessions, conference socials, committee breaks, and the opening and closing ceremonies) and, by extension, during any events or activities organized in the context of the conference. All delegates have indicated their acceptance of, and agreement to abide by, the terms of the Code of Conduct in their completion of registration at CANMUN 2024.

Harassment and Discrimination

1. All conference participants are expected to be respectful of each other. Harassment of any form will not be tolerated, which includes, but is not limited to, discrimination based on ethnicity, national origin, race, colour, religion, age, mental and physical disability, socio-economic status, gender identity, gender expression, sex and sexual orientation.
2. Harassment and Discrimination through any medium must be refrained from by participants, which includes but is not limited to:
 - a. In-person harassment, such as speech, gestures, sounds, phrases, touching etc.,
 - b. Digital mediums such as social media, text messages, email, phone calls, etc.,
 - c. Written mediums such as notes, written speeches, directives, etc.,
3. The secretariat of CANMUN 2024 reserves the right to determine what constitutes bullying and other inappropriate behaviour towards any individual and/or group.
4. The engagement of behaviour that constitutes physical violence and/or the threat of violence against any individual and/or group, including sexual violence and harassment is strictly forbidden, and may include, but is not limited to, the following:
 - a. Indecent and/or unwelcome suggestive comments about one’s appearance,
 - b. Nonconsensual sexual contact and/or behaviour among individuals or a group of individuals,
 - c. The sexual contact or behaviour between delegates and staff is strictly forbidden;
5. Cultural appropriation is prohibited. This includes, but is not limited to, attire, accents, etc. that belong to a certain cultural, religious, or ethnic community.
6. Reported actions of harassment will thoroughly be investigated and the Secretariat reserves the right to take action (if deemed necessary).

Responsibilities and Liabilities

1. The valuables and possessions of delegates, and the safeguarding thereof, falls under the responsibility of the delegates. Neither Sheraton Centre Toronto Hotel nor CANMUN 2024 and its staff shall be held liable for losses arising due to theft or negligence.
2. Delegates are responsible for the damages they cause to Sheraton Centre Toronto Hotel or its property, the possessions of other delegates, staff, faculty advisors, or other hotel guests.
3. CANMUN 2024, Sheraton Centre Toronto Hotel, and their respective staffs, shall not be liable towards any injury to persons, or damages or losses to property that may occur during the conference or due to a failure to comply to the rules governing said conference, including but not limited to, this Code of Conduct, Hotel rules and applicable laws, statutes and regulations.
4. Delegates are expected to present Conference identification upon request to Hotel and Conference staff.
5. Delegates must abide by Hotel rules while on Hotel premises. In particular, delegates are to refrain from the harassment of Hotel staff and other guests.

Abiding to the Laws of the City of Toronto, Province of Ontario, and Canada

1. Delegates, staff and other participants are required to abide by Ontario and Canadian laws, as well as Toronto by-laws at all times. Of particular note are laws referring to:
 - a. Theft;
 - b. Sexual Violence;
 - c. Possession of firearms and other weapons;
 - d. Trafficking and use of illegal drugs;
 - e. Public disturbances or nuisance alarms, ex. The triggering of an alarm when an emergency does not exist;
2. The legal drinking age in Ontario is 19 years of age. All participants found engaging in illegal activities may be expelled from the Conference and held criminally liable, regardless of legal drinking age of the delegate's residence.
3. All conference venues are non-smoking facilities (including cigarettes, e-cigarettes, and vapes).

Dress Code

1. All participants of CANMUN 2024 are expected to wear western business attire. Delegates, staff and other participants not maintaining an appropriate standard of dress will be asked to change their clothing to fit the dress code. If you need any exceptions to be made, or have questions about the dress code, please contact the Equity team via email, canmunequity@gmail.com.

Illness Policy

1. In light of the recent pandemic, we ask that delegates displaying symptoms of COVID-19, RSV, the Flu, or any other infectious illness to stay home, as to maintain the wellbeing and health of delegates, staff and guests.

2. In the event that you have recently (within one week of the first day of the conference) been in close contact with a positive case of COVID-19 and are not displaying COVID-19 symptoms, please use a rapid test and self-monitor for symptoms before and during the conference.
3. If at any time during the conference you begin to experience symptoms of any illness or feel unwell, **please inform your faculty advisor or a staff member, utilise personal protective gear (such as wearing a mask), and use a rapid test where possible.**
4. If you feel that your wellbeing is threatened/if you are concerned or uncomfortable, please inform a staff member or contact the Equity team via email, canmunequity@gmail.com.
5. CANMUN 2024 nor its agents accept responsibility for the effects of any illness contracted during the conference. Ultimately, it is the responsibility of the individual to monitor the health and wellbeing of themselves, despite the measures put in place.

2SLGBTQIA+ Protection Policy

1. Any homophobia and/or transphobia will not be tolerated. This includes purposeful misgendering, discrimination, outing and/or use of transphobic /homophobic hate speech. All delegates are expected to treat other delegates with respect and refer to them with their preferred pronouns. If you personally feel uncomfortable as a result of the listed events above or due to similar events, please let us know in the form below.

How to Report

If you have a violation of the Code of Conduct to report, here are the following resources/procedures you can use to get in contact with a committee staff/secretariat member.

1. Communicate with a staff member responsible for you/your delegate's committee. They can be contacted via email.
2. Email the equity team at canmunequity@gmail.com. The equity team will get back to delegates in 1-3 business days for concerns before the event takes place, and will respond to delegates on the day of receipt during the conference.

Additionally, if you have any questions about the code of conduct before or during the conference, please email canmunequity@gmail.com. The Secretariat reserves the right to discipline attendees for not adhering to/violating any of the above stipulations. Disciplinary measures include, but are not limited to, suspension or expulsion from committee, removal from the conference/conference venue, disqualification from awards and/or disqualification from future events.

Director's Letter

Dear delegates,

Welcome to the WHO committee for the inaugural CANMUN 2024! My name is Sylvia Zhang, and I am thrilled to be your committee director. I'm a grade 11 student at Branksome Hall, and some of my interests include poetry, visual arts, and computer science. Before we dive into our two committee topics together, I would like to also introduce you to the rest of the dias and explain what you can expect from the committee.

We have your chair Iliyan Gangani and your assistant director Megan Kwan! I would like to express my deepest gratitude to these lovely people for helping me with editing this background guide. The WHO committee this year will be focusing on two important topics: firstly antibiotic resistance and secondly neglected tropical diseases.

Beyond maintaining professionalism and being respectful towards fellow delegates, you are strongly encouraged to familiarize yourself with the aforementioned topics to ensure that meaningful discussions about these subjects can take place during committee. That being said, it is my hope that you all will enjoy yourselves during this committee and take advantage of this opportunity to learn, build friendships, and most importantly, have fun!

While this background guide doesn't encompass all research findings on these subjects, it should serve as a launching point and a checkbox for your own research when you are writing your position paper and speeches. You may find certain sections such as the guiding questions at the end of each topic section to be useful in that regard. Finally, you can expect rules of procedure to be explained in more depth at the beginning of the conference. Please feel free to contact any member of the WHO dias at any time should you need any help in your preparation process! Our emails are below:

Sylvia Zhang: szhang4@branksome.on.ca

Iliyan Gangani: ganganiiliyan@gmail.com

Megan Kwan: mkwan@branksome.on.ca

Can't wait to meet you all and see you soon!

Sylvia Zhang

Introduction

The World Health Organization is an UN agency at the forefront of improving global safety and healthcare (“About WHO”). Funding for the WHO comes from two main sources—first portions of member states’ GDPs known as assessed contributions, and secondly voluntary contributions from other countries (“How WHO Is Funded”). From its establishment in 1948 to the present day, WHO has been committed to achieving universal healthcare access for everyone and serves as a leader in the face of global crises (“About WHO”). WHO currently has its headquarters in Geneva, Switzerland where all members and delegates can meet and debate critical health related topics, guided by their constitution (“About WHO”; “WHO Organizational Structure”).

Collaboration between countries to create partnerships is critical for WHO to run. Besides the United Nations, governments, and multilateral organizations, WHO also works alongside field experts, non-state actors, ambassadors, and other parties (“How We Collaborate”) to achieve their mission. WHO provides invaluable insight into the multitude of scientific, health related, nursing, and policy related perspectives (“How We Collaborate”). Thus when researching and debating, delegates are encouraged to keep in mind the spirit of cooperation and teamwork.

WHO also holds the responsibility of dealing with the recent and infamous epidemic, Covid-19 (“Our Work”). The majority, if not all epidemics and health crises are tackled by the WHO in some capacity, including but not limited to Zika, HIV, malaria, and tuberculosis (“Our Work”) worldwide. These diseases have the power to inflict unprecedented damage to quality of life around the world, which is why the WHO works on the international scale, harnessing the potential of science and research for feasible and accessible solutions (“Our Work”).

What happens then, when the most critical medical lines of defense start to crack? This is the fundamental conflict delegates will be exploring in the first topic—Antibiotic Resistance. As an issue that touches a vast plane of political, social, and economic subjects, delegates will need to find a way to balance several perspectives and find feasible solutions. Delegates are encouraged to be specific and detailed in their approach to both topics. The second topic will be Neglected Tropical Diseases, abbreviated NTDs. As the name might suggest, this topic challenges delegates to consider how to approach and eliminate diseases that often are ignored in the public consciousness.

Definitions and Abbreviations

Definitions

- **Antibiotics** - Medication for bacterial infections (“Antibiotics”)
- **Bacteria** - Microscopic living organisms that have only one cell (ex. E. Coli)
- **Superbugs** - Bacteria resistant to multiple antibiotics (“Antimicrobial Resistance”)
- **Antimicrobials** - Medicines including antibiotics that can prevent infectious diseases (“Antimicrobial Resistance”)
- **Drug fatigue** - An extreme sense of tiredness and lack of energy that can interfere with a person's daily activities that is caused by medications/treatments (*Neglected People, Neglected Diseases 6*)
- **Mass drug administrations** - Population level disease control strategy by providing treatment to an entire community (Kirby Institute)
- **Census** - Survey to find out more about demographic data in a country (Muchiri et al. 2)

Abbreviations

- **NTD** - Neglected Tropical Diseases
- **AMR** - Antimicrobial resistance
- **MRSA** - Methicillin-resistant Staphylococcus aureus
- **WOAH** - World Organization for Animal Health
- **FDA** - Food and Drug Administration
- **GLASS** - Global Antimicrobial Resistance Surveillance System
- **PHAC** - Public Health Agency of Canada
- **NNN** - Neglected Tropical Disease NGO Network
- **WASH** - Water Sanitation and Hygiene
- **MDA** - Mass Drug Administration
- **UNEP** - United Nations Environmental Programme
- **FAO** - Food and Agriculture Organization
- **WHA** - World Health Assembly
- **GDP** - Gross Domestic Product
- **TDR** - Special Programme for Research and Training in Tropical Diseases
- **MDG** - Millennium Development Goals

Topic A: Antibiotic Resistance

Historical Overview

After analyzing various synthetic drugs, Paul Ehrlich discovered salvarsan in 1910, an early antibiotic against syphilis (Dutta). Salvarsan marked the start of plenty more antibiotics to come. This includes penicillin, discovered inadvertently just 18 years later, after a fungus *Penicillium notatum* contacted a *Staphylococcus* bacteria culture under Alexander Fleming's study (Dutta). He later received a Nobel Prize for his work (Dutta). The 1940s ushered in the golden age of antibiotic discovery, where critical medical advancements were made consistently up until the 1960s (Dutta).

Bacterial infections and bacteria related diseases were one of most widespread causes of death before antibiotics (Dutta). Consequently, early antibiotics were revolutionary for healthcare and lifespan. According to Hutchings et al., “the introduction of antibiotics into clinical use was arguably the greatest medical breakthrough of the 20th century” (72). Life-saving operations, such as treatments for cancer, organ transplants, and surgeries would be significantly more dangerous without antibiotics (Hutchings et al. 72). With that impact in mind, it makes sense that even over two millennia ago, humans were searching for ways to overcome the threat of infectious bacterial diseases—Eber's papyrus, dating back to 1550 BC, records the use of mouldy bread and soil as treatments in Serbia, China, Greece, and Egypt (Hutchings et al. 72). The common thread between past and present is the strategy of fighting microbes using other microbes that create useful antibiotics (Hutchings et al. 72). Modern day medicine and technology will quickly demonstrate the versatility and utility of antibiotics in protecting health and improving lives.

Antibiotics are a centerpiece of health and medicine—when they begin to fail, the entire structure and system weakens. The WHO is especially alarmed by the rise of AMR, which includes antibiotic resistance, warning that it “continues to threaten our ability to treat common infections” (“Antimicrobial Resistance”). Additionally, with the threat of “superbugs”—bacteria resistant to multiple antibiotics—the stakes are exceptionally high (“Antimicrobial Resistance”). If all known antibiotics are no longer effective against them, infections may become impossibly difficult to treat (“Antimicrobial Resistance”). All of the applications of antibiotics mentioned previously, would be compromised.

The WHO believes that the “cost of AMR to national economies and their health systems is significant as it affects productivity of patients or their caretakers through prolonged hospital stays and the need for

more expensive and intensive care” (“Antimicrobial Resistance”). The role of health and protection from bacterial infections, death, and illness cannot be understated when it comes to maintaining economies around the world, as well as avoiding further strain on healthcare systems. Furthermore, a less productive workforce means less economic growth overall. Delegates are encouraged, in their research, to find other industries, fields, and important elements of society that would be harmed by antibiotic resistance.

Previous UN Involvement

(Note: Although this committee’s topic is focused on antibiotic resistance, previous UN involvement in antimicrobial resistance as a whole serves as a more holistic picture of general sentiments and approaches towards antibiotics. The AMR framework is the one with which all types of AMR are tackled. This is why delegates may sometimes see this term mentioned in this section instead of only antibiotic resistance.)

The WHO is not alone in preventing antibiotic and antimicrobial resistance. The four main UN bodies that cooperate on AMR are the WHO, UNEP, FAO, and WOAHA (“Antimicrobial Resistance: A Global Threat”). Known as the Quadripartite, they collaborate on the One Health response plan for AMR (“Antimicrobial Resistance: A Global Threat”). Their partnership helps tackle multiple fronts of AMR with each body having different focuses and perspectives on AMR. In 2022, following the *Third Global High-Level Ministerial Conference on Antimicrobial Resistance*, their collaborative bond was further strengthened through aligning those respective focuses and values (“Antimicrobial Resistance: A Global Threat”).

The Quadripartite focuses on increasing collaboration through creating multi-stakeholder venues, measuring progress by promoting national action plans within countries, and advocating for change by harmonizing the efforts of global leaders and experts (“Antimicrobial Resistance: A Global Threat”). That focus increases efficiency as resources can be better directed into helpful channels and actors have more data to make informed choices. Furthermore, the Quadripartite has a role to play in encouraging the adoption of best policies. Dr. Marc Sprenger, the Director of the WHO expressed that “more than 90% of people in the world (6.5 billion) live in a country that has developed, or is developing, a national action plan” to train healthcare professionals, control infection rates, and strengthen AMR detection systems (“Superbugs: The World”). Support for member states in implementing national plans against AMR is financed with the AMR Multi-Partner Trust Fund, specifically targeting “catalytical, coordinated policy advice, technical assistance, and capacity-strengthening programmes” (“Antimicrobial Resistance: A Global Threat”).

By the 2015 World Health Assembly, support for a “global action plan” became truly apparent, prompting the establishment of the ‘Global action plan on antimicrobial resistance’ (“Antibiotic Resistance”). Since then, the WHO has enacted a variety of programs and initiatives for AMR (“Antibiotic Resistance”). The annual World Antimicrobial Awareness Week, for example, seeks to increase awareness about antimicrobial resistance and reduce infection rates through campaigning (“Antibiotic Resistance”). On the other hand, programs like GLASS offer a more “standardized approach” to data collection and decision making (“Antibiotic Resistance”). It broadened the scope of data collection to include population-level data rather than only laboratory data, and included discussions about how AMR impacts the environment (“Global Antimicrobial Resistance”). Furthermore, GLASS helps with achieving more representative data through their detailed guidelines and structure (“Global Antimicrobial Resistance”). Other important programs include the “Global Antibiotic Research and Development Partnership, GARDP”, and the Interagency Coordination Group on Antimicrobial Resistance, IACG (“Antibiotic Resistance”).

The WHO has also created resolutions which detail their proactive framework and approach. During the 68th WHA on May 26th 2015, resolution WHA68.7 recognized the importance of creating a program like the GLASS initiative—the WHO’s first step towards achieving global collaboration (“Global Antimicrobial Resistance”; *Global Action Plan* 1). The WHO and related UN bodies have made significant progress since 2015, evident from all of the programs, initiatives, and resolutions seen throughout the years. However, there is always more to be done in the long term regarding antibiotic resistance. Delegates are tasked with evaluating the past actions and solutions of the WHO to inspire novel solutions.

Topics of Discussion

Sources of Antibiotic Resistance

Although resistance to antibiotics can be developed naturally through chance mutations, its rising trend suggests more systematic causes as well (“Antibiotic Resistance: What Is It”). One prominent source of antibiotic resistance is the overuse and misuse of antibiotics in treating certain illnesses (“Antibiotic Resistance: What Is It”). Animal related industries—particularly agriculture and veterinary health—also contribute as they increase opportunity for mutations to occur and for resistance to spread (“Antibiotic Resistance: What Is It”; Mulchandani et al. 1). Other sources of antibiotic resistance mostly arise as a result of setbacks from existing global issues. The WHO reports that clean water access and sanitation can be determinants of antibiotic resistance, along with access to vaccines, medicines, and knowledge (“Antimicrobial Resistance”).

According to the WHO, “AMR is one of the top 10 global public health threats facing humanity” (“Antimicrobial Resistance”). In 2019, antimicrobial resistance directly caused 1.27 million deaths, and played a role in another nearly 4.95 million (Public Health Agency of Canada 1). The economies of countries around the world will also likely be impacted—especially following the results of the Covid-19 pandemic. An example of one such country is Canada, where it is estimated that losses from resistance related factors will rise to \$7.6 billion by 2050 with current conditions (Public Health Agency of Canada 1). Thus, a lack of action towards antimicrobial resistance will contribute to the degradation of quality of life on financial and security fronts for all individuals.

Animal Industries

Antibiotics are used in agriculture and industrial farming to increase profitability, as they cause faster weight growth in animals and prevent opportunities for diseases to spread, which would lead to losses in profit (“Global Use of Antibiotics”). Thus, one perspective is that antibiotics are important for their current use in satisfying growing global protein demand (Mulchandani et al. 1). However, as these antibiotics are unnecessary from a medical standpoint, their usage in an agricultural context contributes to the overuse and misuse of antibiotics (“Global Use of Antibiotics”).

Compared to their organically raised counterparts, pigs raised with antibiotics host a significantly larger population of MRSA bacteria resistant to Methicillin, the typical antibiotic employed (“Global Use of Antibiotics”). As an example from Denmark, the Danish Food and Drug Administration explained that 68% of pigs in studied industrial farms are carriers of resistant bacteria, while pigs without antibiotics only carry 6% because of less exposure from close proximity and lack of fresh air (“Global Use of Antibiotics”). When coupled with the fact that “around 160,000 tons of antibiotics [were] fed to farm animals annually in 2020” with estimates of 200,000 tons in 2030, the scale becomes much larger (“Global Use of Antibiotics”). Antibiotic resistance furthermore reveals the potential unsustainability of animal industries. Their dependency on antibiotics fuel resistance, which renders their usage less effective in preserving profitability in the future (Mulchandani et al. 2).

The popularity of antibiotics in several member states is another concern. For example in the USA, agriculture is the largest pipeline for antibiotics, making up 80% of the total usage (“Global Use of Antibiotics”). The balance between what current benefits of antibiotic usage in farms exist, and the consequences of antibiotic resistance should be considered by delegates when thinking about respective member state positions. Additionally, delegates are encouraged to consider the intersection between ethics and economics when conducting research.

Overuse, Misuse, and Transparency of Antibiotics

Personal overuse or misuse could be as innocuous as discarding antibiotics before the end of the prescription's recommended date or using antibiotics for viral infections ("Antibiotic Resistance: What Is It"). Often, these mistakes can be attributed to a lack of knowledge on the matter. For example, in Canada, when the PHAC surveyed individuals across the country to find out more about public sentiment on the antibiotics topic, they discovered that a significant portion of responders were not aware antibiotics were ineffective for colds (Public Health Agency of Canada 1). On a worldwide scale, these mistakes accumulate and have the potential to greatly worsen antibiotic resistance. Delegates should consider connections between public health knowledge and preventing antibiotic resistance, and what that could look like knowing current barriers to education and accurate information around the world.

Although the actions of governments and international bodies are not direct sources of antibiotic resistance, the impact of their decisions, whether positive or negative, should not be underestimated. Starting 2016, The WOAHA reported on the relationships between antimicrobials and animals in various volunteering member states (Mulchandani et al. 2). However, the transparency was limited, as contributing countries remained unnamed, rendering it impossible to ascertain whether the data was accurate for member states and to hold parties accountable (Mulchandani et al. 2). Additionally, the types of policies surrounding antimicrobial usage are critical. The strict guidelines in the veterinary field on antimicrobial dosage, prescriptions, and profits in Nordic countries, or the banning of a feed additive colistin in China in 2017 for instance (Mulchandani et al. 2), are all examples of important steps in eliminating resistance. As a subset of antimicrobials, antibiotic efficacy will reap the benefits of these protective policies. On the other hand, out of the 10 largest countries in meat production, 6 keep information about antimicrobial usage private, including Brazil, Russia, Mexico, Argentina, India, and Vietnam (Mulchandani et al. 7). When there is a lack of regulation and rigid frameworks, it becomes more difficult to prevent antibiotic resistance.

Rise of Superbugs

One of the most alarming potential consequences of antibiotic resistance is the rise of superbugs—bacteria which virtually all known antibiotics are ineffective against ("Antibiotic Resistance: What Is It"). Some bacteria which have reached this state are *C. diff*, gonorrhea, staph infections, and tuberculosis ("Antibiotic Resistance: What Is It"). There is also the concern of “nightmare bacteria”, formally named carbapenem-resistant enterobacteriaceae or CRE, particularly for long term hospital patients and individuals with catheters, as it also has a concerning ability to “transfer their antibiotic resistance to other related bacteria” (Sun).

Although antibiotic resistance is the main driver of superbugs, global health crises have undoubtedly expedited their development. In 2020, when the Covid-19 pandemic was a relatively recent and unfamiliar disease, treatment with antibiotics increased (Sun). The Centers for Disease Control and Prevention reported that in the United States, nearly 80% of covid hospital patients used antibiotics from March to October of 2020 (Sun). Covid-19 is a viral infection (Sun), meaning antibiotics would be ineffective, leading to unnecessary exposure. Another amplifier of superbugs is climate change (Kuta). Commenting on a report by the UN's Environment Program, expert Scott Roberts, who specializes in infectious diseases at Yale University, remarked that "Climate change, pollution, changes in our weather patterns, more rainfall, more closely packed, dense cities and urban areas" contribute to "antibiotic resistance" (Kuta).

The consequences of superbugs are similar to those of general antibiotic resistance, but stand at a higher level of risk. Additionally, they can amplify existing disparities between member states. The estimated \$3.4 or more trillion to be lost in GDP from antibiotic resistance would impoverish around 24 million individuals, according to the UNEP (Kuta). Furthermore Anthony D. So, a Johns Hopkins researcher of public health, mentioned that less economically developed member states would be the most impacted from the potential losses to trade, livestock, and healthcare (Kuta). If allowed to proliferate, superbugs would likely worsen these losses significantly, as their spread would be both unmanageable and unpredictable.

The Decline of Effective Antibiotics

By large, the main concern of superbugs is that antibiotics are losing against them. After the golden age of antibiotic development, a period of stagnation ensued starting the 1970s (Dutta). Modern advancements are progressing at a much slower rate than what is necessary to keep pace with superbugs (Cahill). For example, at the moment, all antibiotics that have been approved by the FDA, were made using discoveries prior to 1984—nearly 40 years ago (Cahill). Additionally, the approval process takes up to 15 years and can cost up to \$1.3 billion (Cahill), which is far too delayed and costly to combat the health detriments already manifesting in the world. For this exact reason, many antibiotic producers are plagued with financial issues (Cahill). Firms around the world like Nabriva, Melinta Therapeutics, Adadign, and Achaogen, have all been bankrupted, unable to keep developing antibiotics (Reed). Delegates should focus on all of the factors that slow antibiotic development and consider how these can be mitigated.

Nevertheless, all hope is not lost. There have been efforts to fund investments in antibiotic developers, such as the AMR Action Fund (Reed). It has \$1.2 billion and has recently begun supporting BioVersys, of Swiss background, with \$9 million. Promising research has also surfaced on the usage of artificial intelligence to combat a specific kind of superbug, *Acinetobacter baumannii* (Goodman). What

is particularly interesting is its potential to target and eliminate only harmful bacteria, without removing beneficial ones (Goodman). Delegates should ensure that they consider the future prospects of antibiotics and are encouraged to be creative about their approaches to solutions.

Case Study: Peru

The consequences of antibiotic resistance and superbugs are global, but unequal. Existing international disparities and compromised healthcare systems are bound to come into play. This is especially a concern for low to middle income countries, including Peru (Beaubien).

Two major problems posed simultaneously by antibiotic resistance in low and middle income countries include higher death rates, and difficulties preventing them (Beaubien). In Peru, a lack of strictness on prescription requirements contributes to the difficulties in handling antibiotic resistance (Beaubien). In the case of Covid-19, over 70% of individuals in hospitals had accessed antibiotics prior to their visit (Beaubien). When individuals are able to access antibiotics without prescriptions, there are less barriers to over usage (Beaubien). Also, detection methods and tests tend to be less capable of distinguishing resistance in infections from non resistant infections (Beaubien). Similarly, new antibiotics, which may include important updates, are typically less accessible than they may be in higher income countries, furthering challenges in treating infections (Beaubien).

In Peru, Covid-19 has also played a significant role in increasing the difficulty of preventing resistance (Beaubien). The more issues that exist for currently strained healthcare systems simultaneously, the less power they will have to safeguard quality of life and health. In their research, delegates are encouraged to also look into other global inequalities that Covid-19 reveals.

It is important to recognize what kinds of challenges exist from global inequalities, because it helps direct solutions in more holistic, inclusive, and accessible ways. Antibiotic resistance especially requires thought on global solutions and frameworks, as the state of one country will inevitably impact the rest.

Conclusion

Protecting the efficacy of antibiotics means protecting lives. They are critical medications that allow healthcare and medical industries to provide the world with a better quality of life. A multitude of questions and threats, from overuse in several industries, to intersectionality with other global issues, are facing the world in the status quo, often simultaneously. It will not do to wait idly until disaster

strikes—the WHO, and the delegates of this committee, must act proactively. The fight against antibiotic resistance is a matter of precision in weighing trade offs, and inclusion of multiple perspectives and needs. The types of discussions and actions of the present day will have different impacts for different people, and will ultimately inform the safety of the future.

Questions to Consider

1. How does your member state view the trade offs between antibiotic use and the animal industry?
2. What kinds of ethics are involved with the factory farming industry?
3. How transparent has your member state been about antibiotic usage?
4. What are existing inequalities or healthcare setbacks that already exist in your country? How might these be worsened by antibiotic resistance?
5. How can the WHO encourage and support antibiotic production, research, and innovation on a global scale?
6. In what ways could the public be better informed about overuse of antibiotics?
7. How can innovation and technology play a role in antibiotic resistance?
8. What kinds of policies has your member state pursued against antibiotic resistance? Which stakeholders should bear the responsibility of creating change?
9. Is it worth it to look into alternatives to antibiotics or antimicrobials? How might your member state view the efficacy of such a change?

Topic B: Neglected Tropical Diseases

Historical Overview

Neglected Tropical Diseases abbreviated to NTDs, impacts nearly 1 billion people yet receive scarce coverage from international health dialogue (“Neglected Tropical Diseases”). The name refers to a list of 20 distinct diseases, caused by various microorganisms, parasites, and other pathogens that are most concentrated in tropical regions of the world (“Neglected Tropical Diseases”). The invisibility of these diseases is a unique problem slows down any progress towards eliminating them. This is an ongoing problem for 2 reasons: First, the consequences for anyone who contract them are profoundly detrimental to their health and have significant social and economic repercussions. (“Neglected Tropical Diseases”). Second, they often are pervasive in impoverished communities and counties who already experience limited access to healthcare (“Neglected Tropical Diseases”).

During the 20th century, the concept of neglected tropical diseases emerged due to observations regarding the scarcity of available treatment despite the extensive harm they inflicted (Molyneux et al. 169). While serving as the Head of Health at the Rockefeller Institution, Kenneth S. Warren, an expert, directed particular focus towards liver disease resulting from schistosomiasis. Despite affecting nearly 100 million people, research investment in this area amounted to less than 5 million dollars (Molyneux et al. 169). To combat this limitation, Kenneth S. Warren established research networks dedicated to the cause he named the “great neglected diseases of mankind” (Molyneux et al. 169). WHO became actively involved a few years later, launching its Special Programme for Research and Training in Tropical Diseases, known as TDR (Molyneux et al. 169).

The next stage of combatting NTDs came in the form of investigating methods of treatment. When major pharmaceutical companies entered the scene and began partnering with existing forces, tangible progress began to show (Molyneux et al. 170). For example, with the support of TDR, studies could be conducted towards leprosy, subsequently producing multidrug therapy (MDT), an early effort towards global topical infections (Molyneux et al. 170).

But the critical underrepresentation of NTDs still posed challenges. With HIV/AIDS and malaria taking priority for the MDG 6, many NTDs were sidelined (Molyneux et al. 171). As such, existing advocates and scientists wanted these diseases to be recognized, especially because of their ability to exacerbate poverty. Additionally, the idea of mass drug administrations, treatment for a mass group at large, and chemotherapy started gaining support (Molyneux et al. 170-171). Many decision makers were beginning

to see the potential for mass treatment programmes, and how this method could counter the economic tolls brought on by NTDs (Molyneux et al. 170).

Efforts and progress made from 2000 to 2012 set the stage for the London Declaration, a large scale plan that united international organizations and parties in the journey towards NTD elimination (Molyneux et al. 173). Preventive treatment, using various medical drugs, saw increasing support because of the advocacy during this period (Molyneux et al. 173). By January 2012, Bill Gates had chaired a large-scale meeting in London where donors, organizations, and the WHO created the London Declaration to pledge commitment to NTDs and the group Uniting to Combat NTDs (Molyneux et al. 173). An example of some achievements made include progress within Africa, one or more NTDs have been eliminated in each of 47 various countries (Wasunna). In 2022, Togo reached a milestone by eliminating four NTDs, being the first country to do so (Wasunna). Ultimately, NTD work culminated in a large 2015 achievement, with one billion people having received treatment (Molyneux et al. 173).

For a full list of the 20 recognized NTDs, please see this extra reading link:

<https://www.who.int/news-room/questions-and-answers/item/neglected-tropical-diseases>

Previous UN Involvement

For a variety of reasons, including reducing poverty and supporting impacted communities, the WHO has taken several actions towards eliminating NTDs over the years, helping provide a framework in which multiple other programs can operate better. The overarching sustainability targets of the UN, for example, cover NTDs in Goal 3.3, which provides for the “end of epidemics of...neglected tropical diseases” (“Neglected Tropical Diseases”). The UN measures this target based on the quantity of people who remain in need of support for NTDs, provided in SDG indicator 3.3.5 (“Neglected Tropical Diseases”).

Past actions towards eliminating NTDs and mitigating their impacts have usually involved several collaborators. At the forefront of research are WHO Collaborating Centres, which platform academic voices comprising universities and centres for research (“Collaboration”). Their guidance on the direction of NTD programmes makes them a valuable resource for creating change. Another demonstration of continued partnerships is the series of Global Partners Meetings, started in 2007 (“Collaboration”). As the name suggests, these meetings are focused on uniting scientists, benefactors, and healthcare representatives towards a common destination (“Collaboration”). While the first meeting was targeted towards health equity, the second meeting in 2017 generated much needed thought and progress towards funding and agreeing upon future priorities of NTD elimination (“Collaboration”). The

Global Partners Meetings were key to laying out the big picture and the targets that the UN could further discuss to execute. Delegates are encouraged to consider existing partnerships or the creation of new ones to reduce the impact of NTDs on human lives.

The UN is able to help build frameworks as it has the power to influence global views on NTDs. For example, created in 2009, the Neglected Tropical Disease NGO Network (NNN) is the driving force behind strategy documents like the ‘BEST Framework’ in 2016 and WASH Toolkit in 2019 (“Collaboration”). Along with creating strategies and frameworks, the UN sets up roadmaps and are able to set foundational, broad global targets in targeting NTDs. For example, the essential NTD milestones established in the first NTD road map gave direction for action during the years 2012 to 2020 (“Neglected Tropical Diseases”). A more recent and updated document is the roadmap covering key actions and changes starting 2021 up to 2030, which will greatly aid in the goal of elimination by 2030 (“Neglected Tropical Diseases”).

In conclusion, the UN is invested in the eradication of NTDs for a variety of reasons ranging from quality of life to promoting development. It can aid in uniting forces, coordinating collaborative efforts, and creating best practice guidelines for the international community to implement. However, there is still much room for improvement, especially on the fronts of efficiency, setting realistic goals, and increasing awareness. Delegates are encouraged to consider how the WHO, as an agency of the UN, can further these goals and responsibilities, and improve on the weaknesses of past initiatives of the UN for NTDs.

Topics of Discussion

Causes of Neglect and Impacted Communities

From improving public safety and wellbeing to strengthening the size of the workforce and economic activity, member states have a lot at stake when it comes to eliminating NTDs. However, these benefits cannot be fully achieved with current levels of neglect and the constant deprioritization of NTDs.

Existing challenges to finding treatments for NTDs are intensified by the invisibility of the disease. Increasing public awareness and care for NTDs will therefore be critical in creating effective solutions; targeted solutions that address the root causes of neglect, both in policy making and in practice, are necessary. In many cases, it comes down to a matter of priority, as sudden events, such as Covid-19 and cases of natural disasters take precedence (World Health Organization). Given this complex position, consideration towards effective allocation of resources, cost-effectiveness of solutions, and careful budgeting is imperative.

There are several reasons for the continual neglect for NTDs. For many governments, mitigating the impacts of diseases that have higher case death rates is the most important, thus allocating less attention and resources, including funding, towards reducing NTD infections (World Health Organization). In 2020, when Covid-19 began, only 798 million people were accessing mass treatment interventions—a large decrease from the 1.207 billion just one year ago (“Neglected Tropical Diseases”). These disparities in priority additionally result from the fact that many NTDs are much more long term and chronic, meaning symptoms can surface much later than the initial time of infection, and they can impact people and communities for a lifetime (World Health Organization).

It’s not only neglected on the policy side: lack of public education and awareness on the subject also plays a significant role in the invisibilization of NTDs. Dr. Maria Revollo Polo, a WHO lead focusing on Onchocerciasis elimination, says that “when you say neglected tropical diseases, people think that they are rare diseases when actually they are among the most frequent diseases in the world and affect millions of people” (*Neglected People, Neglected Diseases* 1). The attitudes people hold towards NTDs are important as they can influence behaviour and action.

However, treatments are only impactful if the end users are able and willing to receive it. Many NTD treatment plans are characterized by long term prescriptions of medication because of the lifespan of parasites (*Neglected People, Neglected Diseases* 6). NTDs like lymphatic filariasis and onchocerciasis must be treated for a minimum of 12 to 15 years (*Neglected People, Neglected Diseases* 6). As a result, some individuals begin opting out of treatment due to weariness over time, also known as drug fatigue (*Neglected People, Neglected Diseases* 7). This is problematic because current health strategies including mass drug administrations or MDAs, covered in more depth in later sections, rely on the whole of a community receiving treatment simultaneously (Kirby Institute). A lack of accessibility to NTD treatment programs is also a significant barrier; NTDs are worsened by existing barriers to healthcare. In rural areas, conflict zones, regions with a lack of clean water and sanitation, and places impacted by climate change, NTD prevalence may increase (“Neglected Tropical Diseases”). Additionally, considering economic inequalities between various populations lead to healthcare disparities, it may be more difficult to mitigate the impacts of NTDs (“Neglected Tropical Diseases”).

Addressing the neglect for NTDs leads to positive outcomes on multiple fronts. The WHO has deemed NTD interventions as “best buys” for public health, because of its more than proportionate socio-economic benefits for specific instances of intervention (*Neglected People, Neglected Diseases* 1). Specifically, for every dollar, in USD, used towards NTDs, about \$25 is saved in productivity and other external costs (*Neglected People, Neglected Diseases* 1).

For delegates, the challenges of neglect, long term impacts, and intersectionality with existing barriers should act as a starting point for policy building; standard public health policies and solutions will be hindered by the issues outlined in the aforementioned paragraphs. Making meaningful progress in eliminating NTDs and ensuring treatment for people globally relies on the debate and discussion about best practices.

Discrimination and Stigma

The medical director at Netherlands Leprosy Relief, Vim Van Brakel, argues that the inclusion of people with disabilities will lead to universal health coverage (Moloo). NTDs often lead to physical disabilities and/or changes in outward appearances (Moloo), thus for many people with NTDs, existing stigmas towards disability and physical appearance are a large determinant of their livelihoods and quality of life. As societal pressures and attitudes towards individuals with NTDs shape their behaviour, the normalization of stigma and viewing NTD conditions as “embarrassing” can lead people to avoid treatment (Moloo). Dismantling these discriminatory attitudes towards NTDs will therefore be important to increasing the efficacy of treatment and elimination programmes.

Stigma is often the result of a lack of representation and understanding. It highlights the need for constant reevaluation of attitudes towards various subject matters including NTDs in the status quo. Samhita Kumar, the Associate Director at the Carter Center for mental health, affirms the importance of public education in dismantling narratives and recommends media power as a conduit to a better educated society (Moloo). Emmanuel Agumah, who founded and serves as the president of BUVA Foundation, similarly compels us to recognize the need for change in stating that “traditional thinking tends not to respect people who end up with disability due to a disease” (Moloo). The risk that comes with enabling stigma to remain is that organizations like the WHO lose their power to an individual’s internal motivations such as fear, embarrassment, humiliation, and shame; it becomes much more difficult to diagnose and treat NTDs if stigma encourages a culture of silence surrounding someone’s health.

In contrast to the previously mentioned internal challenges that individuals face surrounding their health, a lack of accessibility can also often be a result of externally experienced stigma (Adekeye et al. 100). External stigma includes judgment from other people based on appearances, apprehension for different forms of close contact, physical violence, and dehumanization (Adekeye et al. 101). These stressors can lead to anxiety, depression, and— especially for women—trauma from abandonment. For the same reasons, people with visible conditions from NTDs may lose their livelihoods, exacerbating poverty (Adekeye et al. 100). Thus, any necessary hospital costs become much more difficult to afford, forcing people in many cases to sell important assets, such as livestock (Adekeye et al. 104). With less accessibility to healthcare, an enduring positive feedback loop forms.

To work towards established public health goals, work needs to be done keeping in mind the interdependence of NTDs and existing inequalities.

Mass Drug Administrations and Barriers

The standard approach/strategy towards NTD elimination has typically been mass drug administrations, a strategy that “[controls] a disease at the population-level” (Kirby Institute). MDAs are a subset of preventive chemotherapy, which is the idea that by providing a drug, or a combination of drugs en masse to a particular community, it would more easily prevent transmission of microorganisms (“Preventive Chemotherapy”). Rooted in population oriented planning, preventive chemotherapy, and by relation MDAs, is used primarily for endemic areas or specific demographics such as children (“Preventive Chemotherapy”).

Understanding the current methods used in NTD elimination is essential to recognizing current priorities and values as well as areas that must be reformed. While solutions to a multi-faceted and long term issue like NTDs likely will not come in a short period of time, policymakers can still strive to make solutions as efficient as possible. Delegates should be aware that careful evaluation of priorities can help achieve this goal. Moreover, analyzing MDAs in the status quo leads to further discussion on countering systematic flaws and barriers to implementation as solutions become more efficient when they are targeted towards the critical issues. Delegates should consider which points and areas their respective member states would believe are the most important or feasible areas for improvement through considering their values, resources, and perspectives.

Through the years, the world has reached some key milestones regarding MDAs and NTD elimination. In the WHO’s 2005 strategy for public health, ideas of “large-scale preventive treatment” were emerging as policy makers began to value and desire “innovative and intensified disease management” (Muchiri et al. 2). Future efforts, policies, and sentiments have evolved from the foundational ideas, but have also maintained the spirit of always seeking change. From 2015 to 2019, the annual number of people receiving treatment for one or more of five specified NTDs reached one billion as a result of increased donations and funding (“Control of Neglected Tropical Diseases”). Beyond the increase in the quantity of people benefitting from MDAs, this statistic reflects the potential for significant change when actors, like pharmaceutical companies, the WHO, international donors, and governments (“Control of Neglected Tropical Diseases”), are committed to the cause. By 2018, the list of NTDs that were recommended by the WHO to be treated with preventative chemotherapy had expanded to include leprosy (“Preventive Chemotherapy”). Looking towards the future, there is the WHO’s road map for NTDs from 2021 to 2030 (Muchiri et al. 2).

For all that current solutions and policies have achieved, there are multiple areas to improve. For one, the current models of MDAs in many member states is to tend to “one disease at a time”, which can quickly get expensive and unsustainable (Kirby Institute). Key resources will continue to be wasted in the status quo, while simultaneously lengthening the time it takes to eliminate NTDs. As stated in previous paragraphs, long term consequences will continue to impact people around the world. Another barrier is a lack of accurate information for planning and decision making. Demographic data for example, is crucial to ensuring that treatment campaigns reach correct populations (Muchiri et al. 2). However, incomplete or outdated data about populations can easily derail this process (Muchiri et al. 2), causing difficulty in proper planning and by extension, execution of treatment campaigns. Not only is this a major waste of resources, inaccurate data is also likely unrecognized because of the ethos of official census data. Delegates should consider how data about populations may be incorrect, and how they can help remedy that.

Additionally, community permanence is not a given for everyone. Population level movement can be influenced by external determinants for displacement, such as conflict, insecurity, and climate change (Muchiri et al. 6). For populations that periodically move from region to region, the chance of being missed by MDA campaigns is much higher (Muchiri et al. 2). Delegates should consider the current barriers to preventive chemotherapy, MDAs, and other strategies for public health related to NTDs.

Case Study: Timor-Leste

The question is no longer whether flaws exist, or what methods exist to solve them. It is about the best practice method that is the most efficient with available resources, time, and power. However necessary they are, innovations and changes to the status quo take time. In the meanwhile, it may be beneficial to consider building on current policies, initiatives, and frameworks. Timor-Leste’s integrated MDA program demonstrates how it is not necessary to break the mold to make a difference. In fact, starting with established methods can strike a balance between utilizing the resources already available in the system, while breaking ground in efficacy.

As previously mentioned, a typical solution framework looked like calling for an MDA, applying it to one disease, and moving on to the next (Kirby Institute). To circumvent the costly nature of MDAs, Timor-Leste shifted towards using multiple drugs for multiple diseases in parallel (Kirby Institute). This integrated MDA approach was implemented in 2019 through a national program of the Ministry of Health (Kirby Institute).

The program called for the administration of 3 drugs simultaneously: ivermectin, diethylcarbamazine citrate, and albendazole (Kirby Institute). These were used for increasing coverage for the NTD lymphatic filariasis, which was the primary goal at the time (Kirby Institute). However, spillover benefits would reach other diseases, such as scabies and impetigo, thus dealing with multiple diseases at the cost of one MDA (Kirby Institute). According to Susana Vaz Nery, an associate professor at the Kirby Institute, “Ivermectin MDA for scabies is usually administered in two doses, however a reduced dose has significant benefits in terms of cost and logistics” (Kirby Institute).

As a result of this policy, Timor-Leste achieved 76% national coverage on their original goal of lymphatic filariasis (Kirby Institute). This reached the WHO target for lymphatic filariasis (Kirby Institute). Furthermore, according to a study of 1000 children conducted by Josh Francis, who works at the Menzies School of Health Research, “18 months following the MDA, scabies prevalence had reduced by 62%, impetigo by 86% and whipworm infections by 84%” (Kirby Institute). However, outside of Timor-Leste, this policy could inform tweaks to other national MDA programs in other member states. Additionally, it may address the issue discussed earlier about the systematic deprioritization of NTDs. If diseases can be tackled in parallel, countries would be better able to deal with NTDs consistently.

While planning solutions, delegates may find it worthwhile to look at strategies of the status quo and critically analyze what resources are available.

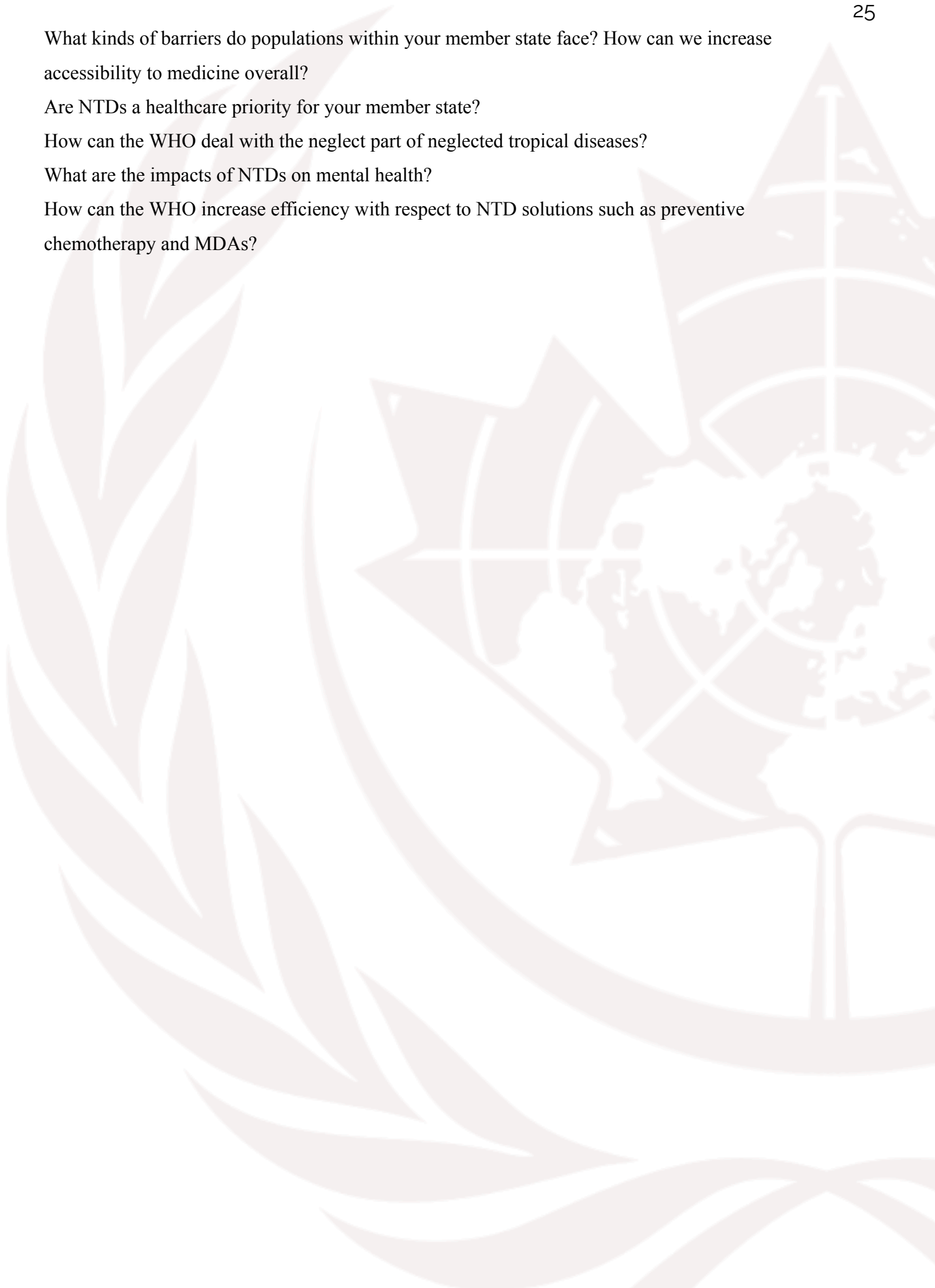
Conclusion

Shifting attitudes around NTDs and finding effective solutions should be considered when finding solutions for NTDs in endemic areas. As a highly interconnected issue, there will be challenges with creating comprehensive and realistic solutions. Delegates are encouraged to work together and embody the spirit of collaboration, whether in resources or policy. Further, NTDs are both impacted by, and impact existing inequalities in the world. Recognizing the cyclical nature of NTDs is beneficial.

Questions to Consider

1. What are current strategies that your member state has in place for NTDs or that your member state may support?
2. How might your member state be economically impacted by the elimination of NTDs?
3. What are inequalities and disparities that your member state faces? How might we be able to support people who are impacted?

4. What kinds of barriers do populations within your member state face? How can we increase accessibility to medicine overall?
5. Are NTDs a healthcare priority for your member state?
6. How can the WHO deal with the neglect part of neglected tropical diseases?
7. What are the impacts of NTDs on mental health?
8. How can the WHO increase efficiency with respect to NTD solutions such as preventive chemotherapy and MDAs?



Bibliography

- “About WHO.” *World Health Organization*, 2023, www.who.int/about. Accessed 23 July 2023.
- Adekeye, Oluwatosin, et al. “Exploring the Well-Being of People Affected by Skin NTDs in Kaduna and Kwara States, Nigeria: A Photovoice and Scoping Review Study.” *International Health*, vol. 15, no. 1, Oxford University Press, Mar. 2023, pp. 100–9, <https://doi.org/10.1093/inthealth/ihad003>. Accessed 29 Nov. 2023.
- “Antibiotic Resistance.” *World Health Organization*, 31 July 2020, www.who.int/news-room/fact-sheets/detail/antibiotic-resistance. Accessed 25 Aug. 2023.
- “Antibiotic Resistance: What Is It, Complications & Treatments.” *Cleveland Clinic*, 23 June 2021, my.clevelandclinic.org/health/articles/21655-antibiotic-resistance. Accessed 17 Aug. 2023.
- “Antibiotics.” *Cleveland Clinic*, 24 May 2023, my.clevelandclinic.org/health/drugs/16386-antibiotics. Accessed 4 Aug. 2023.
- “Antimicrobial Resistance.” *World Health Organization*, 17 Nov. 2021, www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance.
- “Antimicrobial Resistance: A Global Threat.” *UN Environment Programme*, 17 Sept. 2020, www.unep.org/explore-topics/chemicals-waste/what-we-do/emerging-issues/antimicrobial-resistance-global-threat. Accessed 24 Aug. 2023.
- Beaubien, Jason. “Why Humans Are Losing the Race against Superbugs.” *NPR.org*, 20 Jan. 2022, www.npr.org/sections/goatsandsoda/2022/01/20/1074373834/why-humans-are-losing-the-race-against-superbugs.
- Cahill, Kathleen. “Superbugs: A Global Health Threat.” *Pew Trust*, 3 Mar. 2022, www.pewtrusts.org/en/trust/archive/winter-2022/superbugs-a-global-health-threat. Accessed 23 Aug. 2023.
- “Collaboration.” *World Health Organization*, 2023, www.who.int/teams/control-of-neglected-tropical-diseases/collaboration. Accessed 16 Oct. 2023.

“Control of Neglected Tropical Diseases.” *World Health Organization*, 2023,

www.who.int/teams/control-of-neglected-tropical-diseases/interventions/strategies/preventive-chemotherapy. Accessed 9 Dec. 2023.

Dutta, Sanchari Sinha. “The History of Antibiotics.” *News Medical*, 21 June 2022,

www.news-medical.net/health/The-History-of-Antibiotics.aspx. Accessed 4 Aug. 2023.

Global Action Plan on Antimicrobial Resistance. World Health Organization, 26 May 2015, pp. 1–4,

apps.who.int/gb/ebwha/pdf_files/WHA68/A68_R7-en.pdf. Accessed 25 Aug. 2023.

“Global Antimicrobial Resistance and Use Surveillance System (GLASS).” *World Health Organization*,

www.who.int/initiatives/glass. Accessed 25 Aug. 2023.

“Global Use of Antibiotics for Livestock.” *The World Counts*, 2023,

www.theworldcounts.com/challenges/consumption/foods-and-beverages/antibiotics-used-for-livestock.

Accessed 18 Aug. 2023.

Goodman, Brenda. “A New Type of Antibiotic, Discovered with Artificial Intelligence, May Defeat a

Dangerous Superbug.” *CNN*, 25 May 2023,

www.cnn.com/2023/05/25/health/antibiotic-artificial-intelligence-superbug/index.html. Accessed 23

Aug. 2023.

“How We Collaborate.” *World Health Organization*, 2023, www.who.int/about/collaboration. Accessed 25 July

2023.

“How WHO Is Funded.” *World Health Organization*, 2023, www.who.int/about/funding. Accessed 28 July

2023.

Hutchings, Matthew I., et al. “Antibiotics: Past, Present and Future.” *Current Opinion in Microbiology*, vol. 51,

no. 1, Oct. 2019, pp. 72–80, <https://doi.org/10.1016/j.mib.2019.10.008>.

Kirby Institute. “Strong Evidence for Integrated Mass Drug Administration to Control Neglected Tropical

Diseases | Kirby Institute.” *University of New South Wales Sydney*, 17 May 2023,

www.kirby.unsw.edu.au/news/strong-evidence-integrated-mass-drug-administration-control-neglected-tropical-diseases. Accessed 27 Nov. 2023.

Kuta, Sarah. “‘Superbugs’ Could Kill up to Ten Million Additional People Each Year by 2050.” *Smithsonian*

Magazine, 10 Feb. 2023,

www.smithsonianmag.com/smart-news/superbugs-could-kill-up-to-ten-million-additional-people-each-year-by-2050-180981599/. Accessed 23 Aug. 2023.

- Moloo, Ashok. “Neglected Tropical Diseases: Tackling Stigmatization, Discrimination and Mental Health through a Person-Centred Approach.” *World Health Organization*, 12 Oct. 2020, www.who.int/news/item/12-10-2020-neglected-tropical-diseases-tackling-stigmatization-discrimination-and-mental-health-through-a-person-centred-approach. Accessed 28 Nov. 2023.
- Molyneux, David H., et al. “The History of the Neglected Tropical Disease Movement.” *Transactions of the Royal Society of Tropical Medicine and Hygiene*, vol. 115, no. 2, Jan. 2021, pp. 169–75, <https://doi.org/10.1093/trstmh/trab015>.
- Muchiri, Geoffrey, et al. “Challenges and Strategies for the Uptake of Mass Drug Administration among Pastoralist Communities in South Sudan.” *Frontiers in Tropical Diseases*, vol. 4, Feb. 2023, pp. 1–10, <https://doi.org/10.3389/fitd.2023.1007480>. Accessed 9 Dec. 2023.
- Mulchandani, Ranya, et al. “Global Trends in Antimicrobial Use in Food-Producing Animals: 2020 to 2030.” *PLOS Global Public Health*, edited by Ismail Ayoade Odetokun, vol. 3, no. 2, Feb. 2023, pp. 1–11, <https://doi.org/doi.org/10.1371/journal.pgph.0001305>. Accessed 17 Aug. 2023.
- Neglected People, Neglected Diseases*. Economist Impact, 2022, pp. 1–10, impact.economist.com/perspectives/sites/default/files/economist_impact_neglected_people_neglected_diseases_2022.pdf. Accessed 26 Nov. 2023.
- “Neglected Tropical Diseases.” *World Health Organization*, 16 Jan. 2023, www.who.int/news-room/questions-and-answers/item/neglected-tropical-diseases. Accessed 25 Sept. 2023.
- “Our Work.” *World Health Organization*, 2023, www.who.int/our-work. Accessed 28 July 2023.
- “Preventive Chemotherapy.” *InfoNTD*, www.infontd.org/cross-cutting-issues/preventive-chemotherapy. Accessed 4 Dec. 2023.
- Public Health Agency of Canada. “Canadian Antimicrobial Resistance Surveillance System (CARSS) Report 2022.” *Government of Canada*, 23 Nov. 2022, pp. 1–115, www.canada.ca/en/public-health/services/publications/drugs-health-products/canadian-antimicrobial-resistance-surveillance-system-report-2022.html. Accessed 20 Aug. 2023.

Reed, Tina. "The Struggle to Contain the Global Threat of Superbugs." *Axios*, 19 Jan. 2023,

www.axios.com/2023/01/19/struggle-superbugs-antimicrobial-resistance. Accessed 23 Aug. 2023.

Sun, Lena H. "Pandemic Fueled Surge in Superbug Infections and Deaths, CDC Says." *Washington Post*, 12 July 2022,

www.washingtonpost.com/health/2022/07/12/superbug-infection-antibiotic-resistance-pandemic/.

Accessed 21 Aug. 2023.

"Superbugs: The World Is Taking Action, but Low-Income Countries Must Not Be Left Behind." *World Health Organization*, 29 May 2017,

www.who.int/news-room/commentaries/detail/superbugs-the-world-is-taking-action-but-low-income-countries-must-not-be-left-behind. Accessed 25 Aug. 2023.

Wasunna, Monique. "Africa Is Winning the War against Neglected Tropical Diseases." *DNDi*, 18 Feb. 2023,

dndi.org/viewpoints/2023/africa-is-winning-the-war-against-neglected-tropical-diseases/. Accessed 12

Oct. 2023.

"WHO Organizational Structure." *World Health Organization*, 2023, www.who.int/about/structure. Accessed 25

July 2023.

World Health Organization. "Why Do Neglected Tropical Diseases Suffer Low Priority?" *ReliefWeb*, 2 Feb.

2022, reliefweb.int/report/world/why-do-neglected-tropical-diseases-suffer-low-priority. Accessed 21

Nov. 2023.