

# World Health Organization(WHO)

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**Topic A: Managing Global Infectious Disease Outbreaks**

**Topic B: Addressing the Global Threat of Antibiotic Resistant Bacteria**

**Director: Tanya Sankhla**

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**POSITION PAPERS DUE on October 17th by 11:59 pm to Committee Email**

October 24-25, 2020

To Delegates of CHSMUN Advanced 2020

Dear Delegates,  
Welcome to CHSMUN Advanced 2020!

It is our highest honor and pleasure to welcome you all to our 2020 online advanced conference here at Cerritos High School. On behalf of the Cerritos High School Model United Nations program, we are proud to host our very first advanced conference, where you will become more knowledgeable on international issues, participate in intellectually stimulating discussions, and create new and everlasting friendships.

The CHSMUN program continues to compete around the world as a nationally ranked MUN program. Our delegates utilize diplomacy in order to create complex solutions towards multilateral issues in the global community. Our head chairs are selected from only the best seniors of our program, undergoing a rigorous training process to ensure the highest quality of moderating and grading of debate. Furthermore, all the topic synopses have been reviewed and edited numerous times. We strongly believe that by providing each and every delegate with the necessary tools and understanding, he or she will have everything they need to thrive in all aspects of the committee. We thoroughly encourage each delegate to engage in all of the facets of their topic, in order to grow in their skills as a delegate and develop a greater knowledge of the world around them.

Although this wasn't what we expected, our advisors and staff have put in countless hours to ensure delegates have an amazing experience at the online conference. Our greatest hope is that from attending CHSMUN 2020, students are encouraged to continue on in Model United Nations and nevertheless, inspired to spark change in their surrounding communities. With this strong circuit consisting of 6 schools and over 500 delegates, CHSMUN Advanced 2020 will provide a quality experience for intermediate delegates to enhance their speaking and delegating skills.

If you have any questions, comments, or concerns, please contact us! We look forward to seeing you at CHSMUN Advanced 2020!

Sincerely,

Anjali Mani and Karishma Patel

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Secretary-Generals

## **A Note From The Director**

Delegates,

My name is Tanya Sankhla and I am beyond excited to serve as your Director for the World Health Organization (WHO) Committee this year! I am currently going into my 5th year as an MUN delegate. MUN has always been a passion of mine and I can't wait to see everyone demonstrate their skills in a new online format. Some of my hobbies include tumbling, baking, reading, and playing with my dog. I truly enjoy debating and learning from conferences which is what I hope you all will experience in this committee. I have chosen topics very prominent today in the real world so discussions will be very insightful and interesting! I look forward to meeting you all.

Sincerely,

Tanya Sankhla

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Director, WHO

## **Committee Introduction**

Originally created on April 7, 1948 (World Health Day), the World Health Organization (WHO) works with 194 Member States, across six regions, in order to direct and coordinate international health work through collaboration. The United Nations (UN) committee acts as an overseer for international public health to better health systems currently set in place, created response strategies for non communicable and communicable diseases, and support national healthcare frameworks through international cooperation. WHO originally set up headquarters in Geneva, Switzerland, and has since expanded to have six regional offices with more than 7000 people working in 150 country offices.

A remarkable accomplishment of WHO was leading a global immunization campaign in response to the contagious outbreak of Smallpox. Their campaign had led Smallpox to be the only infectious disease outbreak completely eradicated. WHO has also made efforts to combat noncommunicable diseases such as cancer, diabetes and heart disease, which now account for 70% of all deaths, through prevention and control efforts. In response to current circumstances with the Coronavirus Pandemic, WHO has been working on prevention, surveillance, containment, treatment, coordination and much more to support its member states. Though these mark only a few significant accomplishments, WHO is constantly evolving and collaborating with the international community to better healthcare worldwide.

# Topic A: Managing Global Infectious Disease Outbreaks

## Background:

With the world's current capabilities of global interconnectedness, diseases that spark in a single region have the potential to spread further and faster than ever before. In doing so, these diseases create global pandemics, harming many nations in the process. In order to manage global infectious disease outbreaks, we must first understand their origin and dangers. According to the UN, a global pandemic can be defined as a “worldwide spread of a new disease.” Pandemics cross international boundaries to affect a wide range of people compared to epidemics which normally reside in a single region. Without proper regulations, epidemics can quickly turn to pandemics and spread like wildfires across the globe. The origin of pandemics is most commonly associated with an animal influenza virus. Normally, animals contain viruses that don't spread to humans, but considering that these viruses are constantly evolving, occasionally they find a host in vulnerable human bodies. This new host body then acts as a cellular factory to manufacture more viruses, helping to replicate and spread the virus. In this case, symptoms such as coughing or sneezing encourage bacteria to spread onto other hosts. Once this process has begun, it escalates at an exponential rate in the absence of immediate response, leading to a global infectious disease outbreak. The threat of global pandemics is one that humankind has dealt with since long ago. From 1346 to 1353, the Black Death, commonly referred to as the Bubonic Plague pandemic, had taken root and spread across Europe. The plague had occurred as a result of *Yersinia pestis* bacteria, usually found in small mammals and their fleas. Many rats acted as a host for infected fleas, spreading the plague across continents to create one of the deadliest pandemics of all time. During the fourteenth century, the Black Death had caused over 50 million deaths in Europe. In the present day, this disease could easily be treated with antibiotics. Though, through the example of the Black Death outbreak, it is evident that lack of standard preventative measures could escalate the threat of new diseases immensely. Another notable virus that had been labeled a global pandemic was the Ebola haemorrhagic fever, or Ebola virus disease. Ebola, put simply, originated in animals and spread through humans with the transfer of bodily fluids. Though it was first discovered in 1976, Ebola has had multiple outbreaks over time, most recently affecting West Africa from 2014-2016. This specific outbreak led to more casualties than all past Ebola outbreaks combined, spreading across country borders. The fatality rate of Ebola is an average of 50%, which no approved vaccine as of yet. Yet, in an effort to decrease the death toll, the United Nations called upon their Security Council to support governments with stronger leadership in affected countries, and to open borders of more developed countries for medical evacuation. Through these methods cases have drastically decreased through protective measures that try to control the disease before it spreads from a single region. With experience tackling many disease outbreaks in the past, the international response to virus outbreaks has improved through new vaccinations and response methods, but the deadly threat of new diseases still remains. The Coronavirus pandemic

(COVID-19) has demonstrated the limited capabilities of each nation to control and tackle a new strand of virus immediately. A host of COVID-19 would spread the virus through respiratory droplets produced when they cough or sneeze. With 18.7 million confirmed cases and 705,000 deaths reported, these numbers are expected to grow without proper control. The deadly threat of global pandemics has and will continue to affect the international community in drastic ways. Though it is difficult to predict future outbreaks, we must continue to improve healthcare facilities and regulations to deal with outbreaks as they appear. In our current state of global interconnectedness, once local or regional outbreaks have the potential to arrive on the doorstep of any nation, thus making any infectious disease on one part of the planet the concern of every nation.

## United Nations Involvement:

As part of the United Nations (UN), the World Health Organization (WHO) has taken up the task of responding to global infectious disease outbreaks through supporting member states. To respond to outbreaks, WHO relies upon the World Health Assembly's (WHA) revised International Health Regulations that were adopted in 2005 through the WHA Resolution 58.3. The revised International Health Regulations framework identified eight areas for member states to focus upon improvement: building core capacities in the areas of national legislation, policy and financing, coordination and communications, surveillance, response, preparedness, risk communication, and human resources and laboratories. WHO has already made clear their purpose and goals to provide adequate healthcare and immediate response systems, but the UN body has also expressed concern for safety during these pandemics. This concern has led to communication with other UN bodies as well as affected governments to provide safety and financial support. For example, during the Ebola outbreak in the Democratic Republic of Congo, the United Nations Security Council had adopted resolution 2439 (2018) in order to support WHO's efforts to control the outbreak. This resolution had condemned any attacks by armed groups in the Democratic Republic of the Congo to protect humanitarian and medical essential workers in that area. This resolution was a direct result of WHO's risk assessment in that area, which noted the lack of safety and security to address the outbreak. WHO had also used prediction tools to predict for the virus to expand to Uganda, Rwanda, South Sudan and Burundi, leading the United Nations Security Council to include these regions in the resolution. Additionally, many Non-Governmental Organizations (NGO) are devoted to assisting underdeveloped countries facing extra hardships during a global disease outbreak. For example, during the ongoing COVID-19 Pandemic, where families are advised to social distance at home, the American Red Cross had supported 53,000 people recovering from loss of homes due to fire. Dilemmas such as lack of sanctuary or proper sanitation make people more susceptible to attaining a disease. For this reason the American Red Cross along with numerous other NGOs have made it their mission to fully support those affected by both the economical and social challenges disease outbreaks pose. Oftentimes the role NGOs can play has been underestimated by many nations. An example that truly shows the extent of an NGOs capabilities can be seen by the response to the Avian influenza, otherwise known as the 'bird flu,' in Indonesia. Since 2003, the Avian influenza had continued to spread throughout Indonesia, leading to a \$470 USD economic loss and disruption of over 10 million people's livelihoods relied upon the poultry

industry. Recognizing the capabilities of NGOs, the Government of Indonesia created an official bridge to connect government and non-government programs involved in the control of this outbreak. This bridge, known as the National COmmittee for Avian Influenza Control and Pandemic Influenza Preparedness allowed NGOs to provide financial resources and social capital at both a local and international level with ease and effectiveness. A specific NGO, Muhammadiyah, extended the network of resources it had developed over the past to close the gap between government policy and the communities, involving local villages and communities. This allowed for a better assessment of needs and gave direct information to government officials without the extra time and cost it would normally take. Muhammadiyah is only one example of how NGOs can greatly assist National governments in a pandemic situation if used to its full potential.

## Case Study: Zika Virus Disease in Columbia

Many infectious disease outbreaks have taken root in specific countries and largely damaged others. In 2015-2016, the Zika virus had spread across Columbia, leaving devastation and loss in its path. The Zika virus (ZVD) symptoms are mild and last less than a week, but leads to birth defects when contracted by a pregnant woman. Following the Zika outbreak in Brazil in May 2015, Columbia had begun monitoring themselves. In August 2015, the Colombian Instituto Nacional de Salud (INS) began national surveillance of ZVD. In early October 2015, the first 9 confirmed cases were identified, and an outbreak of ZVD was declared in the country. In July of 2016, Colombia declared an end to the Zika epidemic, with reports of clinical ZVD symptoms in more than 100,000 persons nationwide. Colombia had the second highest number of reported cases among the 50 countries with autochthonous transmission during the outbreak in the Americas. The majority of women who had been infected during the first or second trimester of pregnancy were still pregnant in 2016. Data was collected to analyze the women's pregnancy, suggesting that the greatest risk for adverse outcomes was likely among women who were infected in early pregnancy. Colombia had two national surveillance systems in place before the epidemic — one to capture symptomatic ZVD and the other to capture birth defects — which allowed for the monitoring of the effect of the Zika virus outbreak at the population level. Of the 5673 pregnancies with laboratory-confirmed ZVD for which outcomes had been reported, 93 infants or fetuses (2%) had brain or eye defects. The incidence of brain or eye defects was higher among pregnancies in which the mother had an onset of ZVD symptoms in the first trimester than in those with an onset during the second or third trimester (3% vs. 1%). A total of 172 of 5673 pregnancies (3%) resulted in pregnancy loss; after the exclusion of pregnancies affected by birth defects, 409 of 5426 (8%) resulted in preterm birth and 333 of 5426 (6%) in low birth weight. The prevalence of brain or eye defects during the outbreak was 13 per 10,000 live births, as compared with a prevalence of 8 per 10,000 live births before the outbreak and 11 per 10,000 live births after the outbreak. Overall, the Zika virus was devastating for many mothers who had contracted the disease during the outbreak. Although, the effects had not been seen until the year following when many of their children were born with birth defects. Women that contracted the disease weren't always aware as symptoms made it difficult to distinguish from a common cold, leading to lack of proper treatment or care during the time.

## Bloc Positions:

**Western:** Considering that the Western Bloc is generally more developed and advanced compared to other blocs, their response to managing global infectious disease outbreaks is more advanced. This bloc is constantly evolving its pandemic preparedness plans and frameworks. Though economic stability isn't much of an issue, this bloc still faces the challenge of protecting humanitarian and healthcare workers as well as enforcing immediate response programs during an emergency outbreak. The main issues of this bloc don't stem from lack of resources or funding, though neither of those issues should be ignored, but more from response tactics and government leadership during times of crisis. It is important to have a more consistent approach to reducing the threat of diseases rather than relying on the response of the current leadership.

**Latin America and Caribbean:** Latin America and the Caribbean don't have a guideline in case of an infectious disease outbreak or adequate response plan. With weak social protection, and increasing unemployment rate, and fragmented health systems, it is difficult for this bloc to combat a disease outbreak with their economic state, weak democracy, and struggle to safeguard human rights. During the COVID-19 Pandemic, this region has been facing a terrible economical, social, and humanitarian crisis.

**African:** The African bloc consists of fragile health systems and currently faces other health, environmental, and economic challenges. Alongside this, larger poverty rates make the population more susceptible to disease. Additionally, estimates of the economic impact of COVID-19 on Africa range from 2-5 percent decline of GDP by the end of 2020. Issues mainly faced by this block stem from lack of economic preparedness and guidelines for immediate response. For countries in this bloc it is crucial to look at where they had failed in past disease outbreaks and focus on building responses to those specific hardships considering the pandemic history of this region.

**Asian-Pacific:** With proper guidelines and responses set in place to tackle global infectious disease outbreaks, the potential for the prevention of disease outbreaks in the region is noteworthy. The Asian-Pacific bloc has mostly stable health facilities with access to laboratories for research, advanced technology, and resources. Despite their advanced public health infrastructure, diseases still pose a threat to economies and areas of poverty which struggle to afford proper combatting tools. Poverty acts as a barrier to adequate healthcare since many individuals struggle to find proper housing or means for self isolation during emergency lockdowns. With lack of housing, sanitation, and support, poverty in this bloc poses an overlooked threat to stopping the spread of diseases.

## Basic Solutions:

When addressing how to tackle this topic, it is important to consider different implications. Throughout history nations have continued to better their responses to global infectious disease outbreaks in an effort to reduce negative impacts. Although, efforts vary based

on country development and capabilities, medical facilities, governmental enforcement, and many more factors. First and foremost a delegate should ensure that proper protocol is in place in case of an unexpected outbreak. Immediate response is key to preventing damage caused. Protocols in place should be revised to include more enforcement and strategies based on each nation's capabilities. Once pre-planned measures are implemented, the focus must shift to supporting healthcare facilities and workers. Physical and legal protection for humanitarian and hospital workers must be ensured safety in their workplace. This could look like more protective wear equipment being provided, proper sanitation, and a stable healthcare facility without an overflowing amount of patients. During this, there must also be a research process in play to focus on subduing symptoms and preventing a virus from spreading. Research to cure a viral disease calls for highly advanced facilities and funding which many underdeveloped nations don't have access to. Based on your country's capabilities, collaboration through partnerships of non-profits or more developed countries could be vital in the research aspect. Though research for cures are vital, delegates should focus more upon creating strategies beforehand to prevent overcrowded healthcare centers and enforcement for safety measure protocols. Oftentimes, healthcare centers are unable to host the combined number of patients all at once, lacking certified hospital workers, room to separate patients, and medical equipment. Most medical equipment like masks, protective gear, and operating tools cannot be reused for patients, raising the price for hospitals exponentially. Delegates must find ways to provide enough necessities and healthcare workers/facilities in areas that are unable to do so. As far as safety measure protocols for the general public, enforcement through governmental action is key to preventing the spread of an infectious disease. Lockdown procedures, protective wear, and at home orders should not be recommended, but enforced without infringing on individual rights of citizens. Delegates must be realistic in these situations to understand that there are basic needs for households and limitations of their own governments. Also, delegates should understand that in order to protect the economical state of their country, many lockdown procedures have time limits and restrictions that would hinder the success of their proposed solutions. To reemphasize, delegates must keep in mind certain limitations such as leadership, financial resources, support from outside countries, poverty, and lack of economical structure when proposing solutions. Solutions should be intricate, well thought out, and most importantly realistic. Successful solutions must include a way to tackle a disease outbreak through preparedness and immediate response with respect to capabilities of each host country.

## Questions to Consider:

1. How is your country equipped to respond to global infectious disease outbreaks, and can their response system be improved?
2. In what way has past viral infections affected your country, and has your country taken measures to prevent repetition of those challenges?
3. Has your country's response to the COVID-19 Pandemic been successful, and what has your country done to achieve that success or failure?
4. What other challenges do many countries face, such as lack of economic stability and healthcare infrastructure, that prevent them from having effective emergency responses to disease outbreaks?

5. How can emergency responses to disease outbreaks occur without putting essential workers and healthcare professionals at risk?

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# TOPIC B: Addressing the Global Threat of Antibiotic Resistant Bacteria

## Background:

The overuse and development of antibiotics has born a resistance which threatens the human and animal population. This can be seen in the estimated 23,000 deaths and 2 million infections within the US Population alone. Antimicrobial resistance occurs when microorganisms alter themselves due to exposure to antimicrobial drugs. Thus, resistance not only threatens the treatment of infections caused by bacteria, parasites, viruses and fungi, but also medical procedures such as organ transplantation, cancer chemotherapy, diabetes management and major surgery could be compromised. Since 1928, the invention of antibiotics has revolutionized medical treatment. Antibiotics were modelled after original bacteria and fungi which were initially used as weapon mechanisms for those competing for space and food. With its constant use on the environment, the bacteria and fungi had a weakened effect when used. A similar pattern has recently been seen with bacteria coming in contact with antibiotics when it's used to treat humans or animals. Bacteria's contact to familiar environments leads to microorganisms joining together and sharing DNA in a process known as replication which spreads bacterial infections and diseases. Bacterial infections frequently encounter antibiotics in our bodies, which are overly or wrongfully misused, and not only survive this encounter, but use it to multiply. The multiplication of a bacterial infection displays the first signs of antibiotic resistance. Continual resistance to antibiotics have decreased our ability to treat common bacterial infections, and created a multitude of habits that will result in permanent consequences. Resistant bacterial microbes remain in your body and make you ill as first seen after the mass production of penicillin in the 1940's for World War II. After only 4 years, biochemists Sir Ernst Boris Chain and Sir Edward Penley Abraham had discovered a penicillin-inactivating enzyme capable of immediately destroying the antibiotic and multiplying in the process. This discovery brought attention to the alarming threat of resistance in medicine that could rule many antibiotic based scientific cures as void. Although resistance occurs naturally over time, the misuse of antimicrobials has been accelerating the process. Factors that have contributed to this acceleration include overuse of antibiotics without professional oversight, reliance upon antibiotics for viral infections such as a common cold, and use of antibiotics in healthy animals to prevent, rather than treat, diseases. Misuse can also be seen when the antimicrobial prescriptions are inappropriate, for example wrong drug, wrong doses, or antimicrobials are not necessary at all. Additionally, resistance can spread between people and animals without proper infection control and sanitary conditions. Both of these factors are more prominent in developing nations that are unable to take the proper precautions. For instance, in developing countries the uneven patient-doctor ratio often calls for doctors to sacrifice accurate education and communication with patients regarding guidelines for antibiotics. The patient-doctor ratio also leads to many non-educated healthcare workers acting in place of doctors to make prescriptions that could be more harmful than helpful. In a Lebanese study, it was shown that in

52% of cases, the prescription dose was inappropriate while 63.7% of physicians prescribed antibiotics with wrong duration of treatment. Though this global threat has been more harmful to developing nations that lack educated health professionals, new information and research, and reliable prescriptions, the finite number of antibiotics causes antimicrobial resistance to be alarming to the entire global community.

## United Nations Involvement:

Recognizing its potential dangers, the United Nations has previously passed resolutions to address the growing number of antibiotic resistant bacteria. In 1998 the UN passed Resolution WHA A51/19, the first resolution to address this topic, which mentioned adding surveillance to define resistance in different pathogens and utilize that information to modify national treatment methods. It had also mentioned using national policy workshops to educate healthcare professionals on reducing incorrect usage of antimicrobial agents. This resolution failed to address more specific methods of enforcement and therefore did not have any effect other than shedding light on the issue. Progress has been seen when compared to the most recent resolution, Resolution WHA A68/20 which expanded to address the farming, animal, and food industry as well as national action plans suited to specific countries needs. Through this resolution five strategic objectives of engagement, prevention, access, sustainability, and incremental targets for implementation were mentioned with specific means of application. Although, WHO's most notable accomplishments regarding antimicrobial resistance have not been seen through resolutions, but more through guidelines and collaboration. WHO has been providing assistance to help countries create their national action plans, and strengthen their health and surveillance systems so that they can prevent and manage antimicrobial resistance. Above all, the UN created a "Framework for Action of Antimicrobial Resistance" addressing hygiene, sanitation, and infection preventive measures. The UN's efforts have continually been boosted, although inefficient application of rules and solutions have prevented UN resolutions from reaching their full potential. In order to most effectively address the issue, WHO has been collaborating with many Non-governmental organizations such and other UN bodies such as the Food and Agriculture Organization of the United Nations (FAO) and the World Organisation for Animal Health (OIE). Combined efforts have allowed WHO to adopt accurate health guidelines regarding antibiotic use and to integrate new information into frameworks for member states. Apart from organizations WHO has chosen to collaborate with, WHO has also supported systems such as The Global Antimicrobial Resistance Surveillance System (GLASS) which is a general approach to the collection, analysis and sharing of data pertaining to antimicrobial resistance. By supporting specific systems, WHO has been able to unify different groups conducting research regarding antimicrobial resistance, advancing information by the minute. Notably, the UN Secretary General created the Interagency Coordination Group on Antimicrobial Resistance (IACG) to further strengthen the relationship between international organizations. Chaired by the General of WHO, the IACG has allowed representatives to meet discussing new scientific developments regarding the threat of resistance. In the past when an antibiotic or medicine was used to cure a harmful disease, WHO has ensured taking immediate action. For example, in 2014 there had been about 480 000 new cases of multidrug-resistant tuberculosis (MDR-TB), a form of tuberculosis (TB) that is resistant to the 2 most powerful anti-TB drugs. anti-TB drugs had

been the main source of cheap and effective treatment during this time, but would not work on MDR-TB. Treatment for MDR-TB was most costly and less effective, which meant only about half of the 123,00 cases actually reported were able to be treated. As resistance in tuberculosis grew, a new form of drug resistance tuberculosis known as XDR-TB had shown up, being resistant to at least 4 of the main anti-TB drugs. This resistance meant that what had once been a curable disease now needed a new form of treatment with the same cheap prices and availability. During this time, WHO had taken all data collections that provide us with the statistics previously mentioned, and immediately removed previously recommended anti-TB drugs from guidelines to treat TB. Though this wasn't a permanent solution, this action prevented XDR-TB from growing more resistant than it already had been. Another time WHO had to take action against antibiotic resistance was in 2010 when a drug-resistant HIV resistance in HIV had arisen. A common treatment for HIV was antiretroviral therapy (ART) which had been deemed the cause of this new drug-resistant HIV. The overuse of ART however could not be stopped as in 2015 WHO had deemed it the main treatment for patients with HIV. Resistance has and will continue to expand, but is being monitored over time. Though WHO had been unable to take immediate action, the UN body had been working on a draft of a new "Global Action Plan for HIV Drug Resistance (2017-2021)".

## Case Study: Antibiotic Resistance in Europe

In the past, infectious diseases such as tuberculosis, HIV, and the influenza have led to great loss in many countries, causing a ripple effect to the countries overall economy and health system. In order to truly understand the issues caused by antibiotic resistant bacteria, it is important to analyze how a disease truly affected a specific country: Europe. Each year in Europe, over 33,000 people die due to diseases arising from antibiotic resistant bacteria. This study analyzes five types of infections caused by antibiotic-resistant bacteria in 31 European Union/European Economic Activity (EU/EEA) countries. In doing so, the study had found the impact of those infections, death number, and overall health burden left behind. The study was conducted in 2015 by the European Antimicrobial Resistance Surveillance Network (EARS-Net). The study focused on eight species of bacteria frequently isolated from blood and reported to EARS-Net, with 16 resistance patterns. Some antibiotic resistance combinations found were colistin-resistant, carbapenem-resistant, or third-generation cephalosporin-resistant *Escherichia coli* and *Klebsiella pneumoniae*, methicillin-resistant *Staphylococcus aureus* (MRSA), and vancomycin-resistant *Enterococcus faecalis* and *Enterococcus faecium*. Of these infections there had been bloodstream infections, urinary tract infections, respiratory tract infections, surgical site infections, and other infections. The variety in infections resulted in a more debt study.

## Bloc Positions:

**Western:** Considering that the Western Bloc is generally more developed and advanced compared to other blocs, their response to antimicrobial resistance is more advanced as well.

This bloc generally has more educated healthcare workers with more accurate prescription information. There are also less problems relaying this information to patients since there is a steady and equal doctor to patient ratio. Although there aren't many factors accelerating the process of the formation of resistance, the threat is inevitable. This bloc is most capable of research methods to prevent future resistance and finding new treatments to different diseases.

**Latin America and Caribbean:** In Latin America and the Caribbean, Antimicrobial resistance is widespread and is a limitation for proper treatment of many infections. This region is specifically susceptible to resistance in respiratory pathogens. Latin America and the Caribbean don't have guidelines for dealing. With weak social protection, increasing unemployment rate, and fragmented health systems, it is difficult for this bloc to focus on antimicrobial resistance. Most times treatments are overused and misused with a poor doctor to patient ratio, and concern for this issue isn't nearly as high. Research for antimicrobial resistance also has little profit, giving no incentive to focus upon this problem in the first place.

**African:** The African bloc consists of fragile health systems and currently faces other health, environmental, and economic challenges. Alongside this, larger poverty rates make the population more susceptible to disease. Being disceptile to disease leads to desperation for treatments without proper information and guidelines on using it. This lack of precaution, the poor doctor-patient ratio, and little research regarding the issue, this bloc really struggles to keep up with the accelerating resistance that leads to new strands of infections they can't treat.

**Asian-Pacific:** The Asian-Pacific bloc has mostly stable health facilities with access to laboratories for research, advanced technology, and resources. Similar to the Western bloc, their health systems help slow the growth of resistance in many infections. But still, new strains of resistant infections pose a threat to their population.

Despite having the means for research to prevent future resistance, not much effort goes into preventing new strains from appearing. This is mostly due to the lack of profit in that area of research as well as the lack of concern for this issue seeing as its consequences are often seen.

## Basic Solutions:

Antimicrobial resistance with any antibiotic is inevitable. The finite number of antibiotics further stresses the severity of this issue. When looking for solutions, it is important to consider that antibiotics are still a vital part of many treatments, and there is no permanent replacement for that. First delegates must consider the fact that many prescriptions of antibiotics are incorrect. Especially in developing countries, healthcare workers without proper background and training are able to prescribe antibiotics at any dosage they suppose. There must be a guideline for each antibiotic and safe ways it should be used so no prescription is uneducated. In addition, many healthcare professionals must relay all information to a patient regarding antibiotics and the consequences if it is misused. Oftentimes patients use antibiotics based on how they feel without following instructions given by their doctors or asking if it is safe to do so. This misuse can lead to resistance forming in a particular individual's body, and therefore must be stopped. Furthermore the issue of antimicrobial resistance is aggravated by the fact that most world

pharmaceutical companies consider research for new antimicrobials as being of “low profit.” Since resistance will inevitably develop for new antibiotics, oftentimes researchers don’t focus on finding new antibiotics or slowing resistance, but focus on alternate methods of treatment. Although alternate methods are absolutely necessary for future treatments, it is important not to avoid slowing the acceleration rate of current resistance in antibiotics. Disregarding antibiotics as a whole and using them until an alternative is found is most definitely the worst possible method to address this issue, yet many countries seem to be doing just that. Therefore, the long-term solution should be focused on methods to prevent the emergence of resistance or the spread of resistant organisms from one person to another. It is also important to focus on controlling the spread of antimicrobial resistant bacteria in the first place. Specific types of bacteria can spread through the food supply, animals, and the environment. To help reduce transmission of these harmful bacterias, healthcare centers must follow specific precautions and develop ways to accurately track antibiotics in each patient. When patients show signs of resistance forming at any moment after a successful treatment, antibiotics should no longer be looked to as a key solution. New infection control techniques are necessary, but must keep in mind the limited capabilities of many countries' health care systems.

## Questions to Consider:

1. How can taking antibiotics contribute to antibiotic resistance?
2. What factors that lead to antibiotic resistance are the most important to focus upon for my country?
3. How does the healthcare system of my country create limitations in terms of antibiotic resistance and control techniques?
4. How will antibiotic resistance alter medicine and current treatments in the future?
5. In what way can my country contribute to research for alternate treatments and how would research facilities be encouraged to do so?
6. How has my country dealt with resistance in the past and what changes should be made for future responses?

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