United We Stand

Specialized Agency

World Health Organization (WHO)

Ira Prakash and Deepanshi Kumar
Co-Chairs

GOVERNOR'S SCHOOL MODEL UNITED NATIONS CONFERENCE XXVI

GSMUN XXVI
United We Stand

World Health Organization

Letter from the Chairs

Dear Delegates and Sponsors,

Welcome to GSMUN XXVI's World Health Organization committee! Your chairs Ira Prakash and Deepanshi Kumar are excited to meet everyone in the committee. In this committee, you all will explore and understand cutting-edge concepts in gene-editing, AI technology, epidemiology and political corruption in healthcare administrations. Set in 2013, delegates will work together to resolve ethical concerns regarding new technologies in the medical field and respond to the emerging Zika virus outbreak in the Western Pacific. As delegates in WHO, delegates should emphasize the primary goal of promoting the healthcare of individuals around the world.

Ira Prakash, a junior at Maggie Walker, is thrilled to be a co-chair for GSMUN XXVI. At Maggie Walker, she is on the varsity volleyball team, bhangra team, multiple National Honor Societies and is Treasurer for the Future Medical Professionals Club. She has participated in MUN since the beginning of high-school. She loves to teach taekwondo, is on two non-profit boards, and volunteers at St. Francis Medical Center. She has a passion for medical science and is always finding new opportunities to get involved. You can always find Ira on a boba run,trying to get concert tickets or out with her friends. She can't wait for GSMUN XXVI and hopes everyone has a great time!

Deepanshi, a sophomore at Maggie Walker, is very excited to be co-chairing WHO. She has attended more than a dozen model UN conferences and has won multiple awards since she was in fifth grade. Deepanshi has a passion for all things science, especially research. Outside of MUN, she is an active member of the honor council, bhangra team, and Future Medical Professionals. She has been dancing since she was three and is often trying out new baking recipes in her free time. Deepanshi is looking forward to meeting the incredible delegates and hearing some exciting debate!

As delegates of the WHO committee, you are expected to come prepared to debate controversies in developing technologies and issues in the Western Pacific, as well as, creating potential solutions to resolve chaos and restore order to these countries. Your information in your background guide should precede 2013; however, the source dates do not have to precede 2013. You should be aware of ethical concerns, cultural ideologies, and the basics of epidemiology (spread of diseases and prevention methods). Here at Maggie Walker, GSMUN requires that all position papers follow the Maggie Walker honor code; any and all plagiarism will not be tolerated. This includes the use of ChatGPT and any AI mechanisms to aid in the writing process.

After reviewing the background, delegates must research on their own and write a position paper to be considered for awards. Position paper guides can be found on the GSMUN website, but make sure to format the paper in Chicago Manual Style (CMS), clearly explaining the delegate's solutions and analysis. Delegates must type their paper in Times New Roman, 12-point, double spaced font. Position papers must be emailed to the chairs (gsmunxxvi.who@gmail.com) by 5pm on the first day of the conference.

Finally, this year's charity is the Leukemia and Lymphoma Society. Every year, GSMUN strives to make a difference through our donations towards our charity. There will be baked goods, merchandise and so much more on sale- so don't forget to bring some cash with you for the weekend! Be sure to reach out to your chairs, Ira and Deepanshi, with any questions and concerns for the position paper or the committee details. We are incredibly excited for this committee and the enticing debate on both topics! Looking forward to meeting you at GSMUN XXVI and good luck!

Your Chairs,

Ira Prakash
gsmunxxvi.who@gmail.com

Deepanshi Kumar

World Health Organization (WHO)

Committee Overview

Background

Established on April 7, 1948 in San Francisco, the World Health Organization (WHO) promotes the safety and health of people around the world. The WHO's 194 member states work together to protect communities with ethical research and help prevent the spread of harmful diseases. While their initial priorities were communicable diseases such as malaria, tuberculosis, and venereal disease, they also focus on women's and children's health, nutrition, and sanitation. The organization has a significant role responding to health emergencies using policies and programs that can be implemented in affected areas.

WHO's executive board consists of 34 members, and its headquarters are located in Geneva, Switzerland. All 194 member states convene as the decision-making body for the World Health Assembly, which determines policies, appoints the Director-General, and follows the agenda given by the executive board. WHO still operates under its 1948 constitution, which outlines the organization's mission to provide healthcare to all people.

Funding for the WHO comes from either assessed contributions or voluntary contributions. Assessed contributions are the mandatory membership dues that member states must pay, although the amount varies due to different GDPs. Voluntary contributions are donations from member states, private organizations, and philanthropic sources.[1] Currently WHO focuses upon relieving the issues brought by the Zika Virus and improving the quality of life in Southeast Asia. The region today faces economical concerns as a result of the ongoing pandemic and struggles to uphold gender equality through corrupt politics. Another pressing issue is the emergence of novel technologies in the medical field, including gene editing and artificial intelligence. WHO is tasked with appropriately regulating and adapting public healthcare to these unfamiliar medical tools.

Topic I: Technology in Medicine: Gene Editing and Artificial Intelligence

History of the Issue

The concept of gene editing originated soon after Rosalind Franklin's discovery of the double helix structure of Deoxyribonucleic Acid (DNA) in 1953, and now is a contemporary and revolutionizing technology in the world of medicine. In the 1950s, James Watson and Francis Crick further expanded on knowledge of DNA structure. Thus, scientists began to explore the idea of altering DNA sequences to prevent diseases or change traits in offspring. By the early 1980s, the scientific world began to see genetic modification as the end-all be-all, a perfect way to "fix" human genetic diseases or disorders.

A genetic disorder is caused by a malfunction in genetic sequences, specifically the nitrogenous bases that make up DNA. This malfunction can be a base insertion, deletion, or substitution, among others. Furthermore, the central dogma of biology states that DNA codes for RNA which codes for amino acids that make up proteins. Thus, if there is a malfunction in DNA, then the wrong protein will be created and that protein's function will not be fulfilled efficiently. Early research on gene therapy proved difficult because scientists simply tried to insert a functional version of a certain gene anywhere into the genome, which could not always overpower the malfunctioning gene. Due to this issue, scientists realized they needed to fully correct the genetic malfunctions by cutting DNA strands with

absolute precision. Successful completion of this complex task proved to take decades to accomplish. In 2012, more than 50 years later, Jennifer Doudna, an American chemist, and Emmanuelle Charpentier, a French microbiologist, discovered CRISPR/Cas 9, a piece of transformative technology in the history of gene editing.[2]

Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) can precisely cut genetic sequences in order to either insert or delete information. It works by using a Cas9 enzyme, made up of a Cas protein that trims polynucleotide chains, such as DNA and Ribonucleic Acid (RNA), in the cell. RNA is a one-stranded template of DNA that transports and provides instructions for DNA sequences. Cas9 is a "molecular scissor" that cuts DNA at a specific location with a guiding RNA molecule providing its instructions.[3] Before the widely successful CRISPR technology, other innovations in the field of gene editing were developed. For example, Zinc Finger Nucleases (ZFNs) are made of specific proteins and restriction enzymes that cut the gene sequence at a certain place, which induces a cellular repair mechanism within the cell. This repair mechanism joins cleaved ends of DNA and can result in small changes in the sequence that are known as "gene corrections."[4] Another tool, Transcription Activator-like Effector Nucleases (TALENS), provides a more advanced approach than CRISPR/Cas9 as they can target any area of the genome. They consist of a DNA binding domain with the necessary genetic information and a functional domain that utilizes a restriction enzyme.[5]

Alongside CRISPR technology, artificial intelligence (AI) has emerged as a tool for implementation into clinical practice, improving both accuracy and efficiency. Similar to gene editing, Artificial Intelligence in Medicine (AIM) development began in the 1950s with scientists Robert Ledley and Lee Lusted publishing their visionary paper on the topic. In the 1970s, Stanford created the SUMEX-AIM lab among many other important AIM developments in that decade.[6] Chiefly, the use of AI in medicine can create risk assessment models for diseases and mortality based on large sets of data. It can also help with accurate diagnostics through the immediate analysis of CT scans or MRIs and eliminating human error. Lastly, AI can lead to more efficient workflow because data-related tasks that multiple people would take several hours to complete can be easily and quickly accomplished.[7]

Both gene editing and AIM technologies can have incredibly useful applications in real-world medicine. For instance, experimentation with gene editing can be used to find the genetic causes of diseases in animals. Furthermore, it can be used to improve crops, by using engineered traits, for more efficient reproduction. Recent clinical trials in 2014 used gene therapy and editing to resist human cells from HIV. Testing has been performed on other somatic cells as well, which are cells separate from all human reproductive processes.[8] In addition, AI has many useful applications in medicine, as this technology can use algorithms to more efficiently complete data-centered tasks than humans. Once an algorithm has been created with the right instructions, AI can compute and analyze much faster than a human. If the input for a given algorithm is numerical, such as heart rate, AI can determine the chance of an arterial clot. If the input is image-based, such as a biopsy tissue sample, AI can determine if the tissue is cancerous or not.[9]

There have been many recent advancements in CRISPR and AIM, including human clinical trials using CRISPR for the first time. Researchers employed AI to efficiently detect cancerous tissue in real patients.[10] Additionally, gene editing has allowed for new treatments of cancer, such as CAR-T cell therapy as well as novel treatment methods for sickle cell disease, based on the changing of a single gene base in DNA.

Current Status of the Issue

In recent years, the topic of gene editing in medicine has become highly argued, with a focus on the ethics, business, and legal perspectives. Some scientists are concerned that doctors or patients will not be able to differentiate the line between pure treatment and genetic enhancement, no matter how true their intentions may seem. They also find that commercializing gene therapy in the healthcare industry will be challenging, considering the immense liability that healthcare systems and gene therapy companies would have for patient safety. There are certainly risks when altering gene sequence and expression, especially if it is brought to a larger scale. Not only would companies have to be held responsible for the safety and effectiveness of their technologies, but they would likely face lawsuits in the case of any accidents because a mistake in DNA sequencing can cause severe malfunction of cellular systems. Even if these concerns are addressed, there remains the issue that public policy is not currently on the same page with gene editing as the scientific community, causing legal problems. Scientific research and progression in this field has been prevented due to lengthy ethical concerns posed by national governments. Scientists all over the world have created such influential healthcare technologies, but have very little influence in the public policy that determines how gene therapy is regulated.

While there are certainly issues surrounding gene editing, there are also many enticing benefits. New methods of gene editing allow for specific modifications to traits based on the target genome sequence, introducing greater flexibility and choice for patients. Although it is clear how this freedom can also be a risk to society if misused. The most important benefit is that gene therapy can help cure diseases that have plagued humans for centuries and effectively treat patients. [11] For example, CAR T-cell therapy is a type of gene editing that can be used to treat lymphoma or leukemia. Specifically, it uses gene editing to insert a certain gene into cells which allows the cells to fight and kill the cancer.[12]

Recent advancements in AIM have also brought heated debate about the ethics and safety of AI in medicine. A widespread concern is that robotic technology does not always have the same observational and empathetic skills as humans, which means that they still require human surveillance most of the time. Moreover, a rapid increase in AI in healthcare can eventually cause unemployment in the industry, as technology continues to replace humans. The risk of security breaches or cyberattacks also concerns many healthcare workers and patients due to the data-centered nature of AI. While there have not been any large-scale cyber attacks with sensitive patient information thus far, there is certainly a risk as AI use in healthcare increases. While AIM can seem like a gamble, some would say it should be implemented because of its potential to improve patient care. For instance, it would bring significant advancement to disease research, such as the development of new cures and treatments through large-scale analysis of data. Diagnostics and tests can be run through the implementation of machine learning systems into disease data sets, either numerical or image-based. In hospital environments, AI can use input data to create algorithms for urgent needs and patient care. Furthermore, AI can quickly and efficiently run through patient information or other accounting data, allowing for a more streamlined clinic.[13]

An interesting argument that many professionals claim is that AI can make healthcare more equitable and efficient without replacing doctors or clinicians. They argue that clinicians can incorporate AI into their practices without it completely taking over, which, in turn, provides more comfort to patients. For instance, nurses may rely on AI for organizing and retrieving patient information, but they would still collect further data on their own. Doctors may

analyze patients and develop their own diagnoses, but they would then use algorithms to check and reevaluate. Many speakers at MIT's 2023 AI Cures Conference believed that "AI won't be replacing clinicians anytime soon—but clinicians who know how to use AI will eventually replace clinicians who don't incorporate AI into their daily practice."[14]

The United Nations has also made significant efforts to address concerns about the use of novel technologies in medicine. In 1997, UNESCO presented the Universal Declaration on the Human Genome and Human Rights to provide stability in the emerging world of gene editing. It has become a guiding principle for the scientific advancement of gene therapy around the world. The declaration focuses on respecting human dignity and the rights of those involved in gene editing research. It outlines that those patients affected by gene editing must provide consent and a full assessment of the risks and benefits. Genetic data from patients must also be held private and those involved with the gene editing technology should have full liability for any unexpected effects on patients. Cloning is prohibited and the opportunity to use gene therapy should be equal for all, with no discriminatory regulation. Moreover, the declaration called upon member states to increase regulation and to fulfill the purpose of the declaration as gene editing technologies advance.[15]

Analysis and Solutions

There are many ways to integrate gene-editing technology into patient care, one of the most impactful being gene therapy. This specific technology can help fix protein malfunctions by altering the gene at its source. The central dogma of biology states that DNA codes for proteins that are created by cells, and these proteins perform essential cell functions. Thus, proteins must be created correctly and function properly.[16] Gene therapy has thus far only been used widely for eye and muscle disorders, but further application in clinics has been debated.

One of the easiest ways to integrate AI in healthcare is through the use of insurance and patient information algorithms. AI can easily and quickly sort through patient files, medical history, and personal information to provide doctors with the data they need at any given time. This can make patient care more efficient, especially for receptionists or nurses at hospitals. However, there remain many ethical concerns about disclosing this information and data with AI. Increased research and improvement in AI safety could help alleviate this risk. Additionally, AI can be used in surgeries and treatments in hospitals, but the extent of human aid or surveillance varies. Another significant concern of utilizing AI with patient information is AI racism, resulting from systemic racism in the field of healthcare that feeds into algorithms. AI racism could lead to less medical care for minorities and racial groups. Moreover, the risk of discrimination is present in gene editing as well because of how easy it may be to "fix" certain diseases or disorders. This may increase ableism, where there is discrimination towards those with disorders because of the commercialization of gene editing.

Another significant aspect of technologies in medicine is the expansion of research facilities. Thus far, gene editing research has been focused on acquiring greater precision with the target gene sequence. The discovery of ZFNs and CRISPR were huge improvements within this goal, but the future of research remains open.[17] AIM seems to focus on data analytics of patient information, but other possible advancements include applications in cardiology, cancer, and neurology. Future research should have a well-defined focus and strategy to approach existing diseases and cancers.[18]

Prioritizing the use and application of gene editing or AI technology within healthcare systems can be significant to its effect on the industry. Policymakers should consider how to best use these new tools and

allocate available gene editing or AI technology efficiently. Not only must they ensure that these tools are available to all demographics and types of people, but they must also regulate the extent to which novel technology is used to reduce safety risks. It is important to maintain the steady application of gene therapy and AIM into clinics and hospitals, while still satisfying the needs of patients in different countries. Policymakers will also have to grapple with the issue of which cities or areas require these technologies more than others. It is essential to establish AI and gene editing regulations with clear provisions for different types of environments and conditions.

With all these resources in hand, it is important to consider to what extent society should allow technology to be in medicine and healthcare. While AI will help make data analysis easier in healthcare environments, there are still many security concerns for patients. Clinics have already decreased in use due to the use of mobile health (mhealth) tools that have become widespread, through cell phones and smartwatches. This is also beneficial because it allows clinics or hospitals to take care of the more urgent and life-threatening needs with less wait due to mhealth.[19] However, it is important to remember that the algorithms that determine which patients are more urgent could be flawed due to AI racism.

Most policymakers and healthcare professionals agree that AI and gene editing use needs to be regulated, however, more specific provisions are in contention. Establishing regulations that leave room for advancement while still respecting human rights and ethics has proven to be difficult. For instance, safety is a huge concern as one mistake can be monumental when it comes to the human genome. For instance, tampering with a human embryo is a difficult practice to justify. In addition, many are concerned that the wealthier and more privileged will have greater access to gene editing treatments, causing more inequality in society.[20]

While the EU has created legal provisions surrounding AI and more specifically, the protection of data, countries are still concerned. They call for more security of patient and hospital data to allow for more widespread use of AIM. These countries' concerns are valid because AI companies can easily sell hospital data to other pharmaceutical or biotech corporations.[21] Nonetheless, gene therapy and AI certainly have relevant benefits to medicine and healthcare. Gene therapy is a promising technology for curing diseases and treating disorders, while AI can revolutionize the hospital environment. The more AI and gene therapy are allowed to advance through research, the more efficient the medical field can become, although there are many relevant ethical, safety, and data risks that exist.

Questions to Consider

1. How can WHO ensure gene editing and AI access is equitable across all nations? How would these technologies be implemented in developing nations?
2. What role should governments have in future gene editing or AI research and how may scientists work with policymakers to transform their research focuses?
3. How should the WHO address cybersecurity risks with patient data collected through AIM across the world? What regulations or policies should be implemented?
4. To what extent should WHO openly support gene editing research and expansion, and how wary should they be of ethical concerns?
5. How can the WHO address the ethical concerns of technology as a primary tool for medicine, especially to the public?
6. What role should patients have in choosing to use gene therapy, considering the possibilities of genetic enhancement and abuse?

7. To what extent should AI be used by nurses and practitioners in hospitals or clinics, and how strictly should it be supervised by humans?
8. What legal terms, if any, need to be established for maintaining the liability of AI and gene editing companies or manufacturers?
9. Is it safe to implement AI and gene editing into regular hospital routines? If not, what timeline should be followed?
10. How can WHO prevent AI racism and ableism with the growth and expansion of AIM and gene therapy? How can they provide these resources to lower socioeconomic classes?

Further Research

1. https://www.nature.com/articles/532289a: A journal article on gene editing research, specifically with human embryos in Sweden, China, and the UK.
2. https://www.hsph.harvard.edu/wp-content/uploads/sites/94/2016/01/STAT-Harvard-Poll-Jan-2016-Genetic-Technology.pdf: A Harvard study and poll on the public's opinion concerning the use of gene editing.
3. https://news.stanford.edu/2019/11/12/ai-gene-editing-pioneers-discuss-ethics/: An article with insightful discussion of ethics of both AI and gene editing among recent research.
4. https://www.nejm.org/doi/full/10.1056/NEJMe2206291: A journal editorial on the overall use and role of artificial intelligence in the medical world.
5. https://www.cuimc.columbia.edu/news/future-gene-editing: An article explaining the possibilities and potential for gene editing in the future.

Topic II: Concerns Arising in Southeast Asia

History of the Issue

Southeast Asia, which includes countries such as Taiwan, Philippines, Singapore, Cambodia, and Vietnam constantly face political, financial, and environmental struggles. In the past, the region has been unable to keep up with new additions of technology and rising leaders. The humidity associated with the geographic location attracts mosquitoes and other insects, contributing significantly to the spreading of countless diseases.

In 1947, Zika Virus, referred to as a strain ZIKV, was first discovered in Uganda.[21] Zika Virus is a disease whose symptoms relate to other arbovirus infections, including but not limited to fever, skin rashes, conjunctivitis, muscle pain, and malaise. The infection is caused by a bite from an affected Aedes species mosquito.[22] The first reported cases were found across Malaysia in 1977. By the beginning of 2013, many ignored the virus and associated it with symptoms of dengue fever, resulting in 73% of inhabitants in the Pacific islands/French Polynesia diagnosed with Zika. Since rape and assault are also ignored problems in Southeast Asia, the virus commonly spread through sexual intercourse, contributing to the 1% of the population that has received ZIKV from prenatal contact. In fetuses, the numbers continue to grow as ZIKV causes microcephaly and other congenital malformations. Most children therefore contract the virus prior to childbirth.[23]

Gender inequality is most commonly associated with health concerns as women's basic necessities are ignored by the political society. Due to the local beliefs of the government, most government officials specializing in health care rely in fate or God's will for the outcome of pregnancies.[24] [25] Over 50% of women in the Southeast Asia Region found difficulty in accessing health care between 2005-2007.[26]

The countries in the Southeast Asia region are in turmoil and chaos because they lack the necessary advancements in technology and strong government. Along with women, countless adolescents access health services infrequently ignored by the healthcare system. These groups hope for a better quality of life that is properly regulated in the future and is not restricted by the government. This region strives to obtain resources and support its primary industries because unavailable medical assistance in each country has contributed to the growing mortality rates, inevitably harming the environment and economy. This deficit of knowledge occurs in private small hospitals whose needs the government does not prioritize due to their need for economic growth.

Although Southeast Asia faces an extreme lack of contraceptives, reproductive laws in the Philippines have changed countless times. Regardless, many Filipino women experience unintended pregnancies because abortion is highly stigmatized as most procedures performed are unsafe. About 1,000 women in the country die each year from these complications compared to the tens of thousands of women hospitalized from them. Rural and low-income women most commonly encounter dangerous procedures due to the high cost of medical services. 25 million citizens in the Philippines are of reproductive age and are uneducated on how to access contraception or use them properly by means of less invasive measures. [27]

Additionally, many Indonesian women and girls, especially those from poor and marginalized communities, struggle to achieve reproductive health in the face of discriminatory laws, policies, and practices. Amnesty International News Report says that Indonesian females encounter government restrictions and discriminatory traditions that place reproductive health services beyond their reach by a block and filter method which is imposed on the internet.[28] The law also required a woman to get her husband's consent to access certain contraception methods, or an abortion in the event that her life is at risk.[29] In Indonesia, women are allowed to marry at the age of 16, and health workers frequently deny the full range of legally available contraceptive services to unmarried or childless married women. The Indonesian government took steps to improve protection for female victims of violence, including authorizing abortion for rape-caused pregnancy, clarifying the legal definition of sexual assault, and increasing penalties for assault. Despite these improvements, they failed to ensure that survivors of rape can access health information and services.

Interviews with dozens of Indonesian women and girls, as well as health workers, highlighted how these restrictions increase unwanted pregnancies and force many women and girls to marry young or drop out of school. About 2 million abortions are performed in Indonesia every year, most of which occur under dangerous conditions. For example, one Indonesian woman became pregnant at 17 and was expelled from school after her boyfriend left her. Traditional healers in her village proceeded with an abortion, however, she developed complications and died two days later from blood loss.[30] Instances affected by Indonesia's law ignore the primary health concerns, signifying the need for reform in the political structure. Indonesia's comprehensive reform effort strives to promote a safer environment in the area for the health and quality of life for their citizens.

Current Status of the Issue

Islands severely contaminated in Southeast Asia have begun to spread towards the Western Pacific, and furthermore South American countries such as Brazil and Columbia. A new discovery emerged recently, stating that Zika virus also triggers other diseases like neuropathy, myelitis, and Guillain Barré syndrome, a rare disorder in which the immune system attacks the peripheral nerves

throughout your body, leaving one paralyzed.[31]

Zika is contaminating Southeast Asia, mostly via travel, leading to the infection of over 81,852 individuals.[32] The income in tropical islands derives from the influx of tourism and therefore, these regions rely heavily on industries to sustain their economy.[33] Without tourism, these economies are severely depleted. Additionally, Indonesia relies on its primary supplies of jewelry, agricultural products, and briquettes to countries like Hong Kong and the United States.[34] Zika virus also causes a loss in productivity because many are unable to work. Unemployment rates are rising and the country is unable to sustain itself in a state of poverty. If struggling to maintain their economy, these countries are unable to implement preventative measures or funds encouraging research.

The overall quality of healthcare decreases as hospitals and clinics are out of supplies and unable to find cures for the virus without support from other countries. The absence of necessary funds and needed medical resources leaves regions and their governments stuck and unable to help their people. Although more than 80% of low income women in the Philippines can not access healthcare, 45% of high-income women also find difficulty.[35] Since seeking healthcare is frowned upon and discouraged by leaders of Southeast Asian countries, current issues about women's right violations make rape and violence more common. Although accessibility to healthcare is not as common in these regions, women and children need more health services. These include counseling and mental health services, interventions to address gender-based violence, and a broad spectrum of sexual and reproductive health care. Women must receive routine check-ups to be able to support the future generation, whereas children are more likely to contract and spread diseases. The corrupt political situation in countries such as the Philippines do not welcome gender equality, leading to more fetal disorders and bringing more disease/ hardship to Southeast Asia.

In the Philippines, the Catholic Church maintains a strong influence on society, particularly through government officials. The church not only condemns abortion, but forbids the use of modern contraceptives. Despite the religious ideologies, recent legislative developments have been supportive of reproductive health. Many tried to promote the natural methods, unlike current president Benigno S. Aquino III, who endorsed the Responsible Parenthood and Reproductive Health Act of 2012.[36] The country has just begun to advance towards modern contraceptive services, counseling, and sex education, particularly for rural and poor Filipinos. This policy is strongly opposed by the church, yet is generally supported by the Philippine public. Now, the implementation of the law is delayed by the Philippines Supreme Court. The Philippines has one of the most restrictive abortion policies in the world, and abortion still remains illegal in all circumstances, including in cases of rape, incest, or fetal impairment. Abortion is considered a criminal offense as the church hierarchy overpowers government officials. The Catholic Church first established power when the Philippines was founded as a Spanish colony. Today, the country is dominated by conservative, Catholic views which have few restrictions of governmental influence on religion. This prominent conservative ideology can jeopardize women's health as it affects the policy agendas placed within the Filipino government.[37]

Gender norms discourage and even prevent the use of sexual and reproductive health services by unmarried young women. Many young rural migrant women in China express how they do not feel supported or receive the opportunity to access contraceptive services. Similarly, in other countries, adolescent girls cited major barriers limiting their access to health care as not

getting permission to go to a health facility, not having access to cash, their unwillingness to go alone and concern that women providers may not be available.

Analysis and Solutions

Preventative measures must be taken to prevent the further spread of Zika, the transmission of which can be reduced by addressing the high percentages of women domestically abused. Stopping the spread to other countries and setting restrictions minimizes the likelihood of transmission from mosquitoes. WHO must find ways to protect its citizens for the greater good. Both short-term and long-term laws could be implemented to ensure the security of its citizens and the prosperity of the nations in Southeast Asia. Severe health reforms are needed to improve the area and stop outbreaks from reaching severity again. The Indonesian Badan Penyelenggara Jaminan Sosial Kesehatan (BPJS) social security agency is one of many whose goals are to create programs and coverages.[38] Funds and finances for healthcare access must address the needs of people of lower socioeconomic status.

Considering behaviors to avoid transmission would benefit severely affected areas in Southeast Asia, but it also comes with risks such as mental health issues.[39] The economy must first stabilize to even begin to think about implementing reforms. Public perceptions of risk from Zika virus cause many to frown upon visiting these areas.[40] After the discovery of the virus in Uganda in the mid 1900s, epidemics have occurred in 2007 and now in 2013.[41] Although the government must also be stable to manage upcoming political and medical reform, support must not be lost from other countries and its citizens.

Most economies of Southeast Asian countries rely on foreign investment. For example, due to Indonesia's geographic location, there is an abundance of countless natural resources and a large consumer market of 240 million people.[42] Despite tourism as one of the most important industries, foreign investment is the largest economy in Southeast Asia and is encouraging land purchases for infrastructure. Projects in Indonesia derive funding from company facilitation or commonly foreign direct investment. Direct government control influences the mechanisms for finance outside of Indonesia's industries. The Indonesia Infrastructure Guarantee Fund (IIGF) was established in 2009 to guarantee financial obligations in the country.[43] These governmental guarantees under private projects decrease the bias of government officials and encourage more projects to take place efficiently. The IIGF also attempts to improve transparency between the government and its citizens. Companies in Southeast Asia must get involved to enforce possible public policies. These relationships are easily maintained using standard international commercial principles and reduce the influence of a potentially corrupt government.

Relief programs in Southeast Asia are determined by the International Monetary Fund (IMF). They are responsible for dealing with financial crises across the globe through packages that are quickly adopted by each government. The fund encourages exports and industrial protection as well to regulate the economy. Some economic recovery programs in these regions include A Future that Works, Advancing Multilateral Partnerships for Economic Development (AMPED), and Response and Recovery Assistance to the Philippines (RRAP).[44] China's booming economy contributes to other Asian economies as it is an important destination for the region's exports.[45] Additionally, Southeast Asian countries have recently set up central banks to provide emergency liquidity.[46] Fiscal stimulus packages are set up within Indonesia, which now, is one of the few countries who has a conservative fiscal policy, allowing for them to decrease the deficit of GDP (Gross Domestic Product).

Questions to Consider

1. How can Southeast Asia receive funding for future reforms in the area?
2. What preventative measures could be taken to stop or slow the Zika Virus outbreak on a worldwide and regional scale?
3. How will the government enforce reform? Will the political systems have to be changed to prevent gender discrimination?
4. How will the Indonesian population ensure equality in healthcare accessibility for citizens? Will this affect social classes differently?
5. How can countries in Southeast Asia implement new relief programs to support their citizens?
6. How will countries in Southeast Asia such as the Philippines take measures to promote womens and equality and educate the population on reproductive measures?

Further Research

1. https://www.health.govt.nz/your-health/healthy-living/environmental-healt https://www.api-gbv.org/resources/dvfactsheet-pacificislander/: This is an in depth article about violence in Indonesia and social perspectives of women in the region.
2. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5727043/: This is a national biotechnology article about Zika Virus and its strain. It explains the scientific process and causes of spread in other countries.
3. https://unctad.org/system/files/official-document/ditctncd20031p5_en.pdf: This is a case study that displays the effects of natural events and its outcomes on the Pacific Islands.
4. https://hbr.org/2013/10/the-strategy-that-will-fix-health-care: This is a Harvard article that describes the healthcare system with its possible advantages. It explains the format of a successful strategy

Endnotes

1. "About WHO," World Health Organization, last modified 2023, accessed August 2, 2023, https://www.who.int/about.

2. Judith L. Fridovich-Keil, "Gene Editing," Britannica, last modified May 31, 2023, accessed August 2, 2023, https://www.britannica.com/science/gene-editing.

3. "CRISPR/Cas9," CRISPR Therapeutics, last modified 2023, accessed August 2, 2023, https://crisprtx.com/gene-editing/crispr-cas9.

4. Fyodor Urnov et al., "Genome Editing with Engineered Zinc Finger Nucleases," *Nature Reviews Genetics* 11 (September 2010), accessed August 2, 2023, https://www.nature.com/articles/nrg2842#Abs3.

5. TALEN Gene Editing," Thermo Fisher Scientific, last modified 2023, accessed August 3, 2023, https://www.thermofisher.com/us/en/home/life-science/genome-editing/talens.html.

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