

Forum:	World Health Assembly
Question of:	Ensuring global access to vaccines and their associated technologies.
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Introduction

With the COVID-19 pandemic entering its third year, global access to vaccines and their associated technologies are ever more imperative. Causes of the issue can be derived from More Economically Developed Countries (MEDC's) purchasing more vaccines than necessary to vaccinate their own population. This leads to Less Economically Developing Countries (LEDC's) to not be able to purchase these vaccines as they aren't able to offer as much economic funds to the pharmaceutical companies.¹ According to the analytical company Airfinity, for the COVID-19 vaccine, stockpiles of unused vaccines in MEDC's will surpass 1 billion doses.² Additionally, per the report provided by Airfinity, roughly 60% of vaccine doses are heading to a small pool of rich states such as the United States, the United Kingdom, the European Union nations, Canada and Japan³. For ensuring access to associated technologies, the main issue is that vaccine manufacturing hubs such as mRNA vaccine technology, the most rapidly manufacturable vaccine type, has been dominated by three major US companies⁴. By not having equal spreading of the manufacturers, it results in an overall imbalance of vaccines and its technology required in creating vaccines. With various variants of vaccines spreading across the globe, the importance of equal vaccine distribution is once again highlighted.

¹ Aizenman, Nurith. "Why Low Income Countries Are so Short on Covid Vaccines. Hint: It's Not Boosters." NPR. NPR, November 11, 2021. <https://www.npr.org/sections/goatsandsoda/2021/11/10/1052078529/why-low-income-countries-are-so-short-on-covid-vaccines-hint-its-not-boosters>.

² Aizenman, Nurith. "Why Low Income Countries Are so Short on Covid Vaccines. Hint: It's Not Boosters." NPR. NPR, November 11, 2021. <https://www.npr.org/sections/goatsandsoda/2021/11/10/1052078529/why-low-income-countries-are-so-short-on-covid-vaccines-hint-its-not-boosters>.

³ "Covid-19." Airfinity. Accessed July 8, 2022. <https://www.airfinity.com/products/covid-19>.

⁴ Prabhala, Achal, and Alain Alsalhani. "Developing Countries Can Make the Mrna Vaccines They Need." Nature News. Nature Publishing Group, January 31, 2022. <https://www.nature.com/articles/s41562-022-01304-y>.

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Additionally, another major issue is the lack of developing distribution networks especially in LEDC's. A lack of a governing body for distribution and monitoring of the population that are in need of vaccines and medication was another contributing factor behind the slow spread of vaccines to LEDC's during the COVID-19 pandemic.

The major issues faced in the situation is that more than 100 corporations around the world are willing to and have the capability to recreate the mRNA vaccines given adequate associated technology.⁵ This means that more people in LEDC's would have had access to these vaccines and survived COVID-19 if there were better methods in transporting associated technology in making COVID-19 vaccines. Currently, there are no satisfactory ways to be equipped with the vaccines as quickly as possible.⁶ Additionally, another issue faced is vaccine hesitancy. For LEDC's such as Cote d'Ivoire, even with the arrival of vaccines in early 2021, low acceptance rates for the vaccines, caused by misinformation and rumors led to roughly 40,000 vaccines being used out of 500,000 delivered.⁷ Fake news surrounding social media platforms will need to be solved in order for vaccine implementation to truly be deemed successful. There is no point in receiving vaccines and its technologies if the local population is unwilling to partake in vaccine programmes. Thirdly, the huge imbalance of percentage of individuals vaccinated between MEDC's and LEDC's is an issue. Whilst MEDC's have vaccinated around 70% of its population, LEDC's have vaccinated less than 5% of its population, with the number especially low in African countries.⁸

⁵ "Pharmaceutical Firms across Asia, Africa and Latin America with Potential to Manufacture Mrna Vaccines." Médecins Sans Frontières Access Campaign. Accessed July 8, 2022. <https://msfaccess.org/pharmaceutical-firms-across-asia-africa-and-latin-america-potential-manufacture-mrna-vaccines>.

⁶ Prabhala, Achal, and Alain Alsalhani. "Developing Countries Can Make the Mrna Vaccines They Need." Nature News. Nature Publishing Group, January 31, 2022. <https://www.nature.com/articles/s41562-022-01304-y>.

⁷ World Bank Group. "Covid-19 Vaccines: From Rejection to Shortage, How Côte D'Ivoire Became a Model for Managing Vaccine Hesitancy." World Bank. World Bank Group, January 23, 2022. <https://www.worldbank.org/en/news/feature/2021/09/07/covid-19-vaccines-from-rejection-to-shortage-how-c-te-d-ivoire-became-a-model-for-managing-vaccine-hesitancy>.

⁸ "Only 3 Percent of Africa's Population Is Fully Vaccinated against COVID-19 ECOSOCC Calls for More People to Get Vaccinated." Only 3 percent of Africa's population is fully vaccinated against COVID-19 ECOSOCC calls for more people to get vaccinated | African Union, November 20, 2022. <https://au.int/en/pressreleases/20210917/only-3-percent-africas-population-fully-vaccinated-against-covid-19-ecosoc>.

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The first modern vaccines were invented in the mid 1930's with the development of the Influenza vaccine, with the Influenza A vaccine becoming the first monovalent inactivated vaccine.⁹ The continuation of changes in virus strains and the discovery of new viruses alerted the world and recognized the need for the creation of an intergovernmental organization. This IGO was the World Health Organization (WHO) which was established in 1952. Under the guidance of the WHO, future viruses such as the the Aviaon Flu of 1997 and the Swine Flu in 2009 were managed internationally¹⁰. The WHO now works with governments all over the world with the aim of “promoting health, keeping the world safe and serving the vulnerable.”¹¹ Through the WHO, came the birth of COVID-19 Vaccines Global Access (COVAX) in 2020 due to the rapid spread of the COVID-19 pandemic. COVAX has been working with state governments to “to accelerate the development, production, and equitable access to COVID-19 tests, treatments, and vaccines”¹².

There have been several attempts to solve the issue at hand. In past years, the CDC hosted an annual conference on vaccine research, inviting international agencies and organizations “devoted exclusively to the research and development of vaccines and related technologies for prevention and treatment of disease through immunization, bringing together human and veterinary vaccinology researchers.”¹³

Most notable in recent years would be the COVAX initiative which was launched in 2020 by the WHO to combat the COVID-19 pandemic. COVAX works with the GAVI Vaccine Alliance, and UNICEF with the aim of allowing access to vaccines for everyone¹⁴. COVAX brings together “governments, global health

⁹ Saleh, Amr, Shahraz Qamar, Aysun Tekin, Romil Singh, and Rahul Kashyap. “Vaccine Development throughout History.” Cureus. Cureus, July 26, 2021. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8386248/>.

¹⁰ Saleh, Amr, Shahraz Qamar, Aysun Tekin, Romil Singh, and Rahul Kashyap. “Vaccine Development throughout History.” Cureus. Cureus, July 26, 2021. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8386248/>.

¹¹ “Who We Are.” World Health Organization. World Health Organization. Accessed July 8, 2022. <https://www.who.int/about/who-we-are/>.

¹² “The Access to Covid-19 Tools (ACT) Accelerator .” World Health Organization. World Health Organization. Accessed July 8, 2022. <https://www.who.int/initiatives/act-accelerator>.

¹³ “Notice to Readers: 11th Annual Conference on Vaccine Research.” Centers for Disease Control and Prevention. Centers for Disease Control and Prevention. Accessed July 8, 2022. <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5651a5.htm>.

¹⁴ “COVAX Explained.” Gavi, the Vaccine Alliance, May 30, 2021. <https://www.gavi.org/vaccineswork/covax-explained>.

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organizations, manufacturers, scientists, private sector, civil society and philanthropy, with the aim of providing innovative and equitable access to COVID-19 diagnostics, treatments and vaccines.¹⁵

However, there has been some issues with COVAX. COVAX has raised roughly \$11 billion dollars in donations total, whereas it needed nearly 20 billion dollars to fully function¹⁶. This is seen as a cause of MEDC's not donating as much as they had pledged. The head of the GAVI Alliance came out stating that "We are right now basically out of money." MEDC's simply bought up a majority of the vaccines, thus not having enough funds or vaccines to land at COVAX.

Another attempt by IGO's have been the creation of international funds such as the Go Give One programme. This programme works with both governments and the private sector in distributing vaccines to people who need them the most. The private sector can donate funding to sustain the organization, while governments can help secure the vaccines, and remove barriers in distributing vaccines to LEDC's.

The lack of global access to vaccines and its associated technologies have lasting negative effects on the entire world, but more towards LEDC's. As we live in a more globalized world, there are increased risks. According to the The Centers for Disease Control and Prevention (CDC), diseases which were thought to have been eradicated have the potential to return if individuals are not vaccinated¹⁷. According to UNICEF, children are the most vulnerable to harmful diseases which they may fall victim to due to the lack of sufficient vaccines and the technology to distribute the vaccines¹⁸. Adding on, with the lack of associated technologies in vaccine development and production, people living in LEDC's do not have access to these life saving vaccines even if they wish to be injected¹⁹. This leads to a huge inequality in the quality of life for individuals living in MEDC's and LEDC's as those in MEDC's will have access to

¹⁵ "COVAX Explained." Gavi, the Vaccine Alliance, May 30, 2021. <https://www.gavi.org/vaccineswork/covax-explained>.

¹⁶Taylor, Adam. "Why Covax, the Best Hope for Vaccinating the World, Was Doomed to Fall Short." The Washington Post. WP Company, March 22, 2022. <https://www.washingtonpost.com/world/2022/03/22/covax-problems-coronavirus-vaccines-next-pandemic/>.

¹⁷"Department of Health." The Harm of Skipping Vaccinations or Delaying. Accessed July 8, 2022. https://www.health.ny.gov/prevention/immunization/vaccine_safety/harm.htm.

¹⁸"7 Consequences and Risks of Not Getting Your Child Routinely Vaccinated." UNICEF Indonesia, June 3, 2021. <https://www.unicef.org/indonesia/stories/7-consequences-and-risks-not-getting-your-child-routinely-vaccinated>.

¹⁹ "Absolutely Unacceptable' Vaccination Rates in Developing Countries." World Bank. Accessed July 8, 2022. <https://www.worldbank.org/en/news/podcast/2021/07/30/-absolutely-unacceptable-vaccination-rates-in-developing-countries-the-development-podcast>.

all the vaccines they want whilst people in the developing world would have to stay put, risking their lives.

Definition of Key Terms

Antibodies

Antibodies are protective proteins which are created by the immune system, removing antigens such as bacteria, fungi, viruses and toxins.²⁰ Antibodies are created when individuals receive vaccines. They remain in your body for months or sometimes even years and attack the virus after remembering it, therefore being able to produce antibodies when faced again.²¹ Antibodies are created with the help of the vaccines which are globally received, thus highlighting the importance of antibodies and the global access to vaccinations.

Fully vaccinated

Individuals who are fully vaccinated are those who have finished receiving their vaccinations, receiving all doses necessary with the required amount of time also elapsing²². Those who are fully vaccinated pose less risk to communities, by posing less risk of transmission of the disease vaccinated against. More vaccine distribution would lead to more people being fully vaccinated. This would result in safer communities as there would be less of a threat of viral transmissions of disease. Therefore, exemplifying the importance of global access to vaccines and its technologies.

Vaccine Hesitancy

Vaccine hesitancy represents people who reject the idea of receiving vaccines for economic, social and health reasons. Individuals who are hesitant to vaccines can cause issues as they may cause diseases which were thought to be completely eradicated re-appear and can increase communities' chances of being infected within these diseases. Hesitancy to vaccines is one of the major threats to global vaccine distribution. Individuals having hesitancy toward vaccines will result in lowering of people with antibodies and therefore more people would get sick and negatively affect communities.

²⁰“Antibodies: Definition, Types & Function.” Cleveland Clinic. Accessed July 8, 2022. <https://my.clevelandclinic.org/health/body/22971-antibodies>.

²¹ “Antibodies: Definition, Types & Function.” Cleveland Clinic. Accessed July 8, 2022. <https://my.clevelandclinic.org/health/body/22971-antibodies>.

²²“Coronavirus Disease 2019 (COVID-19) from Mayo Clinic.” Mayo Clinic. Mayo Foundation for Medical Education and Research. Accessed July 8, 2022. <https://www.mayoclinic.org/coronavirus-covid-19>.

Immunization

Immunization is the act of someone becoming protected against a particular disease by becoming vaccinated.²³ Immunization is important in battling diseases and curbing the spread of viruses. Having more vaccines in circulation with global access would result in the number of immunizations increasing and less people becoming severely ill.

Live-attenuated vaccines

Live-attenuated vaccines are a type of vaccine which “contain live pathogens from either a bacteria or a virus that have been attenuated or weakened”²⁴. These vaccines have been used in one of the earliest forms of vaccines but are still used today in solving the issue of global access to vaccines. This is one of the most trusted forms of vaccine production as it has been proven to work over the years with several successful vaccines created using this type.

mRNA technology

mRNA vaccine technology is a new type of vaccine technology which allows one vaccine to be able to protect people from multiple diseases²⁵. mRNA vaccine technology is useful as it can be quickly manufactured with a lower cost, and thus allow more access to vaccines for individuals in LEDC's. More investment in its technology would be useful in increasing vaccine production globally and reaching more people.

Side effects

Side effects are negative implications experienced by an individual after taking a vaccine, with potential side effects of vaccines include: chills, fever, fatigue, nausea and vomiting.²⁶ Side effects of vaccines are one of the major reasons for individuals being against the intake of vaccines. However, these

²³“Immunization Basics.” Centers for Disease Control and Prevention. Centers for Disease Control and Prevention, September 1, 2021. <https://www.cdc.gov/vaccines/vac-gen/imz-basics.htm>.

²⁴“Understanding Six Types of Vaccine Technologies.” Pfizer. Accessed July 8, 2022. https://www.pfizer.com/news/articles/understanding_six_types_of_vaccine_technologies.

²⁵“Immunization Basics.” Centers for Disease Control and Prevention. Centers for Disease Control and Prevention, September 1, 2021. <https://www.cdc.gov/vaccines/vac-gen/imz-basics.htm>.

²⁶“What Are the Vaccines' Side Effects?” Mayo Clinic. Mayo Foundation for Medical Education and Research. Accessed July 8, 2022. <https://www.mayoclinic.org/coronavirus-covid-19/vaccine-side-effects>.

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side effects disappear after a few days. Fear of the potential side effects of vaccines are another one of the reasons why individuals refuse to take vaccines even when they are available. However, most of the side effects are mild and cause no harm in the long term. By not taking the vaccines when available, people are endangering the people around them.

Vaccine effectiveness

Vaccine effectiveness represents how effective a vaccine is. In order to find out how effective a vaccine is, clinical trials are held under real-world conditions ²⁷. Figuring out the effectiveness of vaccines in trials is important as it can check how effective the vaccine would be in the real world. Vaccines with high effectiveness will help lower the amount of hospitalizations and deaths. In order for vaccine effectiveness to increase, pharmaceutical companies should be more transparent with their associated vaccine production technology so that they can work together in developing vaccines for deadly diseases around the world.

Variant

Virus variants are virus which change via mutation and result in a new virus being discovered ²⁸. Even though variants are expected, the WHO and its partners monitor discovered variants. The US CDC states that by using protective measures such as receiving vaccine doses, it will help slow the spread of viruses and the creation of new variants. ²⁹ This shows the importance of global vaccine access as the amount of global virus variants may diminish due to vaccine programmes.

Viral vector vaccines

Viral vector vaccines are “a harmless virus to deliver to the host's cells the genetic code of the antigen you want the immune system to fight.” ³⁰ The Viral vector vaccines have been used as a method in

²⁷“Covid-19 Vaccine Effectiveness Research.” Centers for Disease Control and Prevention. Centers for Disease Control and Prevention, March 22, 2022.
<https://www.cdc.gov/vaccines/covid-19/effectiveness-research/protocols.html>.

²⁸“Understanding Mrna COVID-19 Vaccines.” Centers for Disease Control and Prevention. Centers for Disease Control and Prevention. Accessed July 8, 2022.
<https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines/mrna.html>.

²⁹“Understanding Mrna COVID-19 Vaccines.” Centers for Disease Control and Prevention. Centers for Disease Control and Prevention. Accessed July 8, 2022.
<https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines/mrna.html>.

³⁰“Understanding Six Types of Vaccine Technologies.” Pfizer. Accessed July 8, 2022.
https://www.pfizer.com/news/articles/understanding_six_types_of_vaccine_technologies.

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creating the Ebola vaccine and the AstraZeneca and Johnson & Johnson vaccines, showing their utilization in modern vaccine creation and distribution. Improvements in sharing vaccine technology would lead to the development of simpler and more efficient vaccines throughout the world, augmenting vaccination rates.

Timeline of Key Events

1796 - First Successful Vaccine Administration

The first vaccine was created in 1796 by Edward Jenner who inoculated a 13 year old British boy with the cowpox virus³¹. The vaccine was created after Jenner witnessed milkmaids who had previously caught cowpox (a less lethal virus) didn't get smallpox or got very mild strains of it³². The smallpox virus was a milestone in vaccine history as it was the first successful vaccine development in human history. The successes of the smallpox vaccine lead to further developments of vaccines and its associated technology, saving millions of lives.

7 April 1948 - Creation of the World Health Organization

On April 7th 1948, the World Health Organization constitution came into effect thereby creating the organization³³. The Economic and Social Council (ECOSOC) adapted the constitution which was signed by 61 members of the council. Since the creation of the organization in 1948, the WHO has continuously helped numerous states in being a leading voice of vaccine distribution and the distribution of its technologies. The WHO believes that all states must have access to all vaccines in need and requires in order to solve global issues and common goals.

1961 - Creation of the Bifurcated Needle

The bifurcated needle was created in 1961 as a method to inject vaccine material while using only one-fourth of the material previously needed.³⁴ The vaccine was useful in making sure there was global

³¹“A Brief History of Vaccination.” Immunization Advisory Center, January 8, 2020. <https://www.immune.org.nz/vaccines/vaccine-development/brief-history-vaccination>.

³²“Smallpox Vaccines.” World Health Organization. World Health Organization. Accessed July 8, 2022. <https://www.who.int/news-room/feature-stories/detail/smallpox-vaccines>.

³³“Who We Are.” World Health Organization. World Health Organization. Accessed July 8, 2022. <https://www.who.int/about/who-we-are/>.

³⁴“Bifurcated Needle.” Bifurcated Needle - an overview | ScienceDirect Topics. Accessed July 8, 2022. <https://www.sciencedirect.com/topics/immunology-and-microbiology/bifurcated-needle>.

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access to vaccines as this type of needle led to vaccine material being easier to transport, while lowering the costs of the vaccine.³⁵ This means that the amount of people receiving the vaccine increased, eradicating the disease smallpox from our modern world.

1980 - Eradication of Smallpox

In 1980, smallpox became the first disease to be fully eradicated with the World Health Organization declaring the full elimination of the virus³⁶. The CDC states that this was achievable due to the massive vaccination programmes commenced by governments. This event shows the importance of global access to vaccines and its associated technologies as it demonstrates how a disease which killed hundreds of millions of people was able to be controlled and completely eradicated with the strong will of governments working collaboratively.

January 2000 - Creation of GAVI, the Vaccine Alliance

In January of 2000, the Bill and Melinda Gates Foundation launched the Vaccine Alliance, GAVI, after witnessing that LEDC's did not have sufficient funds in order to vaccinate its population for harmful diseases³⁷. According to the GAVI website, more than 800 million children from LEDCs were vaccinated due to the distribution of vaccines by the organization. The organization is therefore essential to the agenda as it is a leading force on global vaccine distribution. Especially during the COVID-19 pandemic, the GAVI organization has worked with partners in purchasing safe, and efficient vaccines and then allocating them to LEDC's.

Additionally, with the further development of variations in vaccine technology such as viral vector vaccines and live-attenuated vaccines, having an internationally acclaimed vaccine alliance is proving its worth.

April 2020 - Launch of COVID-19 Vaccines Global Access (COVAX)

³⁵“Bifurcated Needle.” Bifurcated Needle - an overview | ScienceDirect Topics. Accessed July 8, 2022.

<https://www.sciencedirect.com/topics/immunology-and-microbiology/bifurcated-needle>.

³⁶“Smallpox.” Centers for Disease Control and Prevention. Centers for Disease Control and Prevention, July 12, 2017. <https://www.cdc.gov/smallpox/index.html>.

³⁷ “About Our Alliance.” Gavi, the Vaccine Alliance. Accessed July 8, 2022. <https://www.gavi.org/our-alliance/about>.

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In April of 2020, with the COVID-19 pandemic raging on, COVAX was launched with the help of GAVI, the WHO, UNICEF, and CEPI³⁸. COVAX has the aim of transporting vaccines to LEDCs who are unable to compete and purchase vaccines against MEDC's while working with healthcare providers and social workers in giving the vaccine doses.³⁹ The launch of the COVAX programme is instrumental for success in providing global access to vaccines and its associated technologies. With the programme working with states from several continents, it is able to serve as a platform where LEDC's can receive vaccines with monetary support in vaccine costs.

11 December 2020 - First COVID-19 Vaccine approved by the FDA

11th December 2020 was the date of which the first COVID-19 vaccine was approved by the US Food and Drug Administration. The vaccine was developed by Pfizer-BioNTech and was approved for ages 16 and up.⁴⁰ The approval by the FDA for the COVID-19 vaccine created by Pfizer-BioNTech signified the recent technological developments in the vaccine industry. The FDA approved the vaccine after discovering that the COVID-19 vaccines were safe, and created effective antibodies in the people who took the vaccine, thus checking the vaccine effectiveness.

With new methods of vaccine technology, vaccines are able to be created faster and more efficiently. This however shows insight in the unbalance of vaccine technology between MEDC's and LEDC's as approved vaccines corporations are mostly situated in MEDC's. So, in order to promote vaccine equity, there must be global access to vaccine technology.

8 March 2022 - Moderna Agrees to Share Vaccine Technology and Not Patent its COVID Vaccine

On March 8th 2022, the pharmaceutical company Moderna agreed to share its vaccine technology with LEDC's by agreeing not to patent its COVID-19 vaccine⁴¹. Moderna stated that they “ want to make sure that we have all the tools to provide the world with a much better response.” Moderna believes that

³⁸ “COVAX: Ensuring Global Equitable Access to COVID-19 Vaccines.” UNICEF Supply Division, May 20, 2022. <https://www.unicef.org/supply/covax-ensuring-global-equitable-access-covid-19-vaccines>.

³⁹ “COVAX: Ensuring Global Equitable Access to COVID-19 Vaccines.” UNICEF Supply Division, May 20, 2022. <https://www.unicef.org/supply/covax-ensuring-global-equitable-access-covid-19-vaccines>.

⁴⁰ Commissioner, Office of the. “FDA Approves First COVID-19 Vaccine.” U.S. Food and Drug Administration. FDA. Accessed July 8, 2022. <https://www.fda.gov/news-events/press-announcements/fda-approves-first-covid-19-vaccine>.

⁴¹ Furlong, Ashleigh. “Moderna to Share Vaccine Tech, Commits to Never Enforce COVID-19 JAB Patents.” POLITICO. POLITICO, March 8, 2022. <https://www.politico.eu/article/moderna-share-vaccine-tech-never-enforce-covid19-patents/>.

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in order to eradicate the virus, global efforts are needed and sharing vaccine technology is a must. LECD's need access to vaccines and its technologies and companies such as Moderna are able to provide them with it through international platforms such as COVAX. With Moderna, one of the leading companies in vaccine development agreeing to share its associated vaccine technology, more companies could follow.

12 May 2022 - US agrees to Share COVID-19 Vaccine Technology

On 12th May 2022, US President Joe Biden announced that it will be sharing technology and knowledge concerning vaccines through the WHO with the aim of reaching people all over the world⁴². In the second global summit on COVID-19, Biden stated in his speech that "We are making available health technologies that are owned by the United States government, including stabilized spike protein that is used in many COVID-19 vaccines." With the United States sharing its vaccine technology and knowledge with other countries, there is hope that companies and other MEDC's will follow suit. The US has taken a step forward in ensuring global access to vaccines, which will boost vaccination levels all around the world, but especially in LEDC's.

Position of Key Member Nations and Other Bodies

World Health Organization (WHO)

The World Health Organization (WHO) promotes global access to vaccines and its associated technologies. In 2021, the WHO had set a target of roughly 70% of all citizens to get vaccinated by 2022⁴³. However, by June of 2022, only 58 out of 194 states fulfilled the 70% vaccination rate with LEDC's having an average of less than 40% of their population vaccinated⁴⁴. Therefore, in order to combat this imbalance of vaccination rates among MEDC's and LEDC's, the WHO has worked with governments, intergovernmental organizations and non-governmental organizations to increase vaccine equity and global access to vaccines. The WHO has worked with organizations such as UNICEF and GAVI in creating COVAX (a vaccine sharing platform) to increase vaccine access to LEDC's. Such actions taken

⁴²Person, and Ahmed Aboulenein. "U.S. Will Share COVID-19 Vaccine Technology, Biden Tells Global Summit." Reuters. Thomson Reuters, May 12, 2022. <https://www.reuters.com/world/us/us-helped-raise-31-billion-global-pandemic-response-2022-05-12/>.

⁴³ "Vaccine Equity." World Health Organization. World Health Organization. Accessed July 8, 2022. <https://www.who.int/campaigns/vaccine-equity>.

⁴⁴ "Vaccine Equity." World Health Organization. World Health Organization. Accessed July 8, 2022. <https://www.who.int/campaigns/vaccine-equity>.

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by the WHO represent its active commitment and attempts in raising global access to vaccines and the sharing of knowledge and technology on the matter.

GAVI, the Vaccine Alliance

GAVI, launched in 2000 is a leader of global vaccine distributions in the world. Working with other states and organizations such as the WHO and UNICEF, GAVI has launched the COVAX platform which has shipped roughly 1.5 billion doses of vaccines towards mostly LEDC's with more than 140 participants⁴⁵. GAVI has had a long history of vaccine distribution, allowing global vaccine access. According to their statistics, they have immunized more than 880 million children since their creation, preventing more than 10 million deaths⁴⁶. GAVI strives to continuously work with other states, non-governmental organizations and intergovernmental organizations to continue promoting vaccine equity to LEDC's and prevent further avoidable deaths. GAVI encourages intergovernmental organizations to cooperate with each other, creating solutions for increasing global access to vaccines and its technologies.

United States of America

The United States of America is one of the leading nations in ensuring global access to vaccines and its technologies. Housing major vaccine corporations such as Moderna and Pfizer, the United States and the companies within hold power in ensuring global access to vaccines. As stated by US President Joe Biden in 2022, the United States is willing to work with platforms such as COVAX in order to share and improve distribution of vaccines and its associated technologies of which the US has plenty. The United States will continue to share its vaccines and technologies with LEDC's with the goal of improving overall global vaccine distribution and prevent preventable deaths especially in LEDC's.

Côte d'Ivoire

Côte d'Ivoire, a LEDC in Africa is facing struggles with the number of vaccines in the country. According to Our World in Data, around 13 million doses of the COVID-19 vaccine have been administered resulting in roughly 21 percent of the population fully vaccinated⁴⁷. This number is far short of the global average of around 60% of the population fully vaccinated. With the help of the COVAX

⁴⁵“About Our Alliance.” Gavi, the Vaccine Alliance. Accessed July 8, 2022. <https://www.gavi.org/our-alliance/about>.

⁴⁶ “About Our Alliance.” Gavi, the Vaccine Alliance. Accessed July 8, 2022. <https://www.gavi.org/our-alliance/about>.

⁴⁷Ritchie, Hannah, Edouard Mathieu, Lucas Rodés-Guirao, Cameron Appel, Charlie Giattino, Esteban Ortiz-Ospina, Joe Hasell, Bobbie Macdonald, Diana Beltekian, and Max Roser. “Coronavirus (COVID-19) Vaccinations.” Our World in Data, March 5, 2020. <https://ourworldindata.org/covid-vaccinations>.

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vaccine shipment however, vaccination rates in Cote d'Ivoire are steadily increasing. With the government actively in charge of vaccination campaigns to encourage its citizens to take the vaccine, as the country was struck with millions refusing to take the vaccine out of concern for side effects and thus vaccine hesitant. There is hope with the actions of the government that Cote d'Ivoire will hit its government set vaccination target rate of 70% by the end of the year.

People's Republic of China

The People's Republic of China has a very high fully vaccinated population with roughly 90% of its population vaccinated per Our World in Data ⁴⁸. According to the Chinese foreign ministry, the government of China has graciously donated a surplus of 1.2 billion doses of COVID-19 vaccines to LEDC's through various international organizations ⁴⁹. China's action demonstrates the willingness of the Chinese government to distribute vaccines and help out LEDC's around the world, with the Chinese government also agreeing to donate around 50 million more COVID-19 vaccines to governments through international organizations and platforms ⁵⁰. Donations by powerful states such as the Republic of China would increase the global supply of vaccines and its associated technologies.

Republic of Korea

The Republic of Korea, holding a fully vaccinated rate of 86% according to Our World in Data ⁵¹ is one of the leading countries with a high fully vaccinated population. However, South Korea as a donor has not been so generous. South Korea according to UNICEF is the 27th largest donor of vaccines, donating around 3 million doses. ⁵² However, South Korea has been actively willing to participate in

⁴⁸Ritchie, Hannah, Edouard Mathieu, Lucas Rodés-Guirao, Cameron Appel, Charlie Giattino, Esteban Ortiz-Ospina, Joe Hasell, Bobbie Macdonald, Diana Beltekian, and Max Roser. "Coronavirus (COVID-19) Vaccinations." Our World in Data, March 5, 2020. <https://ourworldindata.org/covid-vaccinations>.

⁴⁹Song, Wanyuan. "Covid-19 Vaccines: Has China Made More than Other Countries Combined?" BBC News. BBC, October 9, 2021. <https://www.bbc.com/news/58808889>.

⁵⁰"Cold Shoulder from Western Vaccine Makers, but Who in Talks with China." South China Morning Post, December 6, 2021. <https://www.scmp.com/coronavirus/greater-china/article/3158376/coronavirus-who-appeals-chinese-pharma-firms-s-hare>.

⁵¹Ritchie, Hannah, Edouard Mathieu, Lucas Rodés-Guirao, Cameron Appel, Charlie Giattino, Esteban Ortiz-Ospina, Joe Hasell, Bobbie Macdonald, Diana Beltekian, and Max Roser. "Coronavirus (COVID-19) Vaccinations." Our World in Data, March 5, 2020. <https://ourworldindata.org/covid-vaccinations>.

⁵²Stangarone, Troy. "South Korea Can Do More in the Battle against Covid-19." – The Diplomat. for The Diplomat, May 17, 2022. <https://thediplomat.com/2022/05/south-korea-can-do-more-in-the-battle-against-covid-19/>.

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donating funds to help combat the pandemic with South Korea agreeing to donate \$200 million towards the COVAX platform. Actions such as this demonstrate the willingness of the South Korean government to help aid in global vaccine distribution to help LEDC's alleviate pressures of COVID-19 and beat the pandemic.

Japan

Japan, an MEDC, has been continuously donating COVID-19 vaccines through the COVAX initiative, with according to UNICEF, more than 150,000 doses of the vaccine arrived in for immunization to Syria during the late months of 2021⁵³. According to the Japanese government and its ministry of Foreign Affairs, Japan has continuously been donating vaccines to LEDC's with the goal of ensuring "safe, effective, and quality assured vaccines in all countries and regions" (Japanese MOFA). According to its MOFA, Japan has donated more than one billion dollars to the COVAX platform, with the Prime Minister stating that Japan is planning to increase its donation size to add in roughly 500 million dollars more towards the COVAX platform⁵⁴. With the vision of the Japanese government, it is clear that the government of Japan is willing to donate vaccines and help distribute the vaccines in order to solve the COVID-19 pandemic.

Pfizer

Pfizer, a leading global pharmaceutical company situated in the United States, had announced in 2021 that they were planning to provide roughly 500 million doses of their vaccine to the United States government to help their attempt and initiative of providing enough safe and effective vaccines for LEDC's⁵⁵. Pfizer will use its already well established connections with the United States government in selling the vaccines to the government for a lower fee. Pfizer is willing to work with governments around the world in order to help solve the COVID-19 vaccine shortage crisis once and for all.

Canada

⁵³"151,200 Doses of COVID-19 Vaccines Donated by Japan Arrive in Syria." UNICEF. Accessed July 8, 2022. <https://www.unicef.org/mena/press-releases/151200-doses-covid-19-vaccines-donated-japan-arrive-syria>.

⁵⁴"Japan's COVID-19 Vaccine-Related Support May 2022 Ministry of Foreign ..." Accessed July 8, 2022. <https://www.mofa.go.jp/files/100226669.pdf>.

⁵⁵"Pfizer and BioNTech Provide Update on COVID-19 Vaccine Supply Agreement with European Commission." Pfizer. Accessed July 8, 2022. <https://www.pfizer.com/news/press-release/press-release-detail/pfizer-and-biontech-provide-update-covid-19-vaccine-supply>.

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The government of Canada, with one of the largest fully vaccinated populations in the world, currently has vaccines to share with the world. Canada has donated more than 3 billion dollars to international organizations and platforms such as COVAX, with the government aiming to donate an upward of 200 million more doses of vaccines to international vaccine sharing platforms⁵⁶. The government of Canada has launched the Global Initiative for Vaccine Equity (CanGIVE) which deals with sharing vaccines with 13 LEDC states, mostly located in Africa ⁵⁷. The government of Canada is continually developing its global vaccine strategy in order to vaccinate and save lives of those who perish due to easily preventable diseases.

Suggested Solutions

One potential solution would be the creation of an arbitrary body. With deadly diseases plaguing the Earth, cooperation among intergovernmental organizations, non governmental organizations, and states. With the creation of an arbitrary body, there is potential of an independent controlling platform, with enough power and sovereignty within the international realm to negotiate with drug companies who develop the key vaccines. The platform should be managed by global experts on the matter such as WHO certified experts in order to limit potential routes of corruption and unprofessionalism. The main objective of this body would be to collaborate with the aforementioned stakeholders in distributing vaccines where it's most needed. With the COVID-19 pandemic raging for its third year, the importance of cooperation among states has been highlighted. LEDC's were unable to purchase life saving vaccines with the average fully vaccinated rate of these LEDC's way below the global average. Therefore, in this body, collaborating with organizations, vaccines will be able to be distributed where it is needed the most. For example, if there are certain contagious diseases in Africa, the body with funding supplied from sources such as the UN Reserve Funds, the states would not have to worry about not being able to purchase vaccines for its citizens due to lack of monetary funds. Of course, in order for this initiative to succeed, there needs to be some safeguards in place. Price control is a prominent factor which must be considered before implementing the body. Member states must understand that certain LEDC's would not be able to purchase these vaccines even from arbitrary bodies such as this one if the price isn't right. States may reconsider their options, postponing their decisions while deadly diseases rage through their respective

⁵⁶Canada, Public Health Agency of. "Government of Canada." Canada.ca. Government of Canada, June 28, 2022. <https://www.canada.ca/en/public-health/services/diseases/coronavirus-disease-covid-19.html>.

⁵⁷ Canada, Public Health Agency of. "Government of Canada." Canada.ca. Government of Canada, June 28, 2022. <https://www.canada.ca/en/public-health/services/diseases/coronavirus-disease-covid-19.html>.

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state. The price may be subject to the region it is adhering to or the severity of the disease. While it is best to donate the vaccines for free to LEDC's, there needs to be an understanding that mass donations of vaccines are not a feasible solution in today's world. Pharmaceutical companies aren't willing to donate millions or billions of their products to LEDC's. Therefore, looking at the next best option, it is clear that providing the vaccines for a lower fee than when states buy them directly from the pharmaceutical companies may be the way forward. With such factors placed in mind, citizens will gain better access to the global vaccine supply, and thus save millions of preventable deaths from occurring.

Secondly, another potential solution would be to work together with vaccine organizations and non governmental organizations to create workshops for informing governments on the benefits of vaccine technology. In LEDC's, especially African states, there still exist states with leaders of the state who are skeptical of diseases such as COVID-19 and encourage its citizens to stay away. For example, in Tanzania, former president John Magufuli, called for "prayers and herbal-infused steam therapy to counter the virus⁵⁸." Magufuli went against the offerings of vaccines by the international community and due to his actions and refusal to act, Tanzania currently has a fully vaccinated rate of roughly 6%.⁵⁹ Extreme examples such as in Tanzania can show us how the actions and decisions of one individual in power has the ability and potential to risk the lives of millions of citizens. With the creation of the vaccine workshops, it will gather experts from well distinguished organizations such as the World Health Organization to work with world leaders, and those in positions of bureaucratic power to alleviate the pressures of viruses on citizens. With the creation of the aforementioned body in the first suggested solutions, these workshops will also include sessions on how to request support from the international community and private companies. These workshops and sessions will hopefully allow world leaders to understand the importance of having enough vaccines to supply to their entire population. In order for the solution to succeed, all stakeholders must be ready to cooperate among each other. Leaders of states must be willing to keep an open mind on the topics discussed, respecting the experts and the workshops as a whole. The experts will also have to respect the leaders of the states. These are individuals who have sovereignty and power over their citizens and the express will have to realize that the leaders are mostly working for the best interests of their people and their state. If the leaders feel as if the programmes would

⁵⁸"John Magufuli: Questions Raised over Missing Tanzania Leader." BBC News. BBC, March 10, 2021. <https://www.bbc.com/news/world-africa-56347756>.

⁵⁹Ritchie, Hannah, Edouard Mathieu, Lucas Rodés-Guirao, Cameron Appel, Charlie Giattino, Esteban Ortiz-Ospina, Joe Hasell, Bobbie Macdonald, Diana Beltekian, and Max Roser. "Coronavirus (COVID-19) Vaccinations." Our World in Data, March 5, 2020. <https://ourworldindata.org/covid-vaccinations>.

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not be effective in their own state, experts must respect the legitimacy of the rulers and understand their decisions.

Thirdly, another solution to this pressing issue would be to collaborate with key stakeholders and discuss the creation of research centers for disease control. The centers, which can be created using UN Reserve Funds, would be crucial in working with experts to check which technologies are crucial in developing for overall global vaccine supply to increase. Research conducted in these centers will play a pivotal role in understanding the scope of viruses in our world today and which technologies need to be further developed to aid combatting current and potential future diseases. The research centers will also help share associated vaccine technologies with other states, with technologies developed in the research centers will be available for sharing with all member states of the UN if requested. The research centers can be spread in different regions across the world in order to break down the current imbalance of vaccines and its associated technologies gathered around North America and Europe. This will hopefully increase accessibility for LEDC's to vaccines and its associated technologies in comparison to previous years. Supported by member states of the United Nations, the research centers should be created while hosting the aim of 'ensuing global access to vaccines and its associated technologies.'

The world will only be better equipped to fight against new diseases and pandemics if everyone, no matter where they are living in, have access to safe, and affordable vaccinations. We as global citizens must display our bonds of unity by working together for the greater good of humanity.

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