

The Inequality of Covid-19 Vaccines Distribution: Its Repercussions and Its Causes

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ABSTRACT

The inequality of Covid-19 vaccines distribution between countries, could cause severe repercussions in the form of further Covid-19 virus mutation and the renewal of more countagious and deadlier Covid-19 outbreak. This inequality also causes slower recovery of the global economy. The aim of this research is to investigate further about the inequality of Covid-19 vaccines distribution. This research employs a qualitative methodology, and the relevant literature on this research is thoroughly reviewed. The results showed that the inequality of Covid-19 vaccines distribution is caused by the pre-purchase agreements between the pharmaceutical companies and the governments of high income countries, causing middle income countries and low income countries to wait for Covid-19 vaccines shipments. This research recommends the strengthening of COVAX, the intensification of vaccine diplomacy, and the temporary waivers of IP protection for Covid-19 vaccines to solve the inequality of Covid-19 vaccines.

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INTRODUCTION

On December 31, 2019, the Wuhan Municipal Health Commission of China notified that multiple cases of pneumonia had happened in the City of Wuhan, the capital of Hubei Province, People's Republic of China (Hermawan, 2021). Therefore, a new variety of coronavirus was

finally announced as SARS-CoV-2 virus (Song & Zhou, 2020). By 2020, the virus that causes Covid-19 infection has spread rapidly and brought a global pandemic (Jawad, Maroof, and Naz, 2021). As of early of November 2021, there were approximately 250 million confirmed Covid-19 cases and 5.04 million confirmed

Covid-19 deaths globally (Jon Hopkins University, 2021). The Covid-19 pandemic not only caused a global health crisis, but also created a huge blow to global economic activities (Song & Zhou, 2020). In order to stop the Covid-19 pandemic, the governments around the world have decided to initiate lockdowns or stay-at-home orders (Fajrin & Santoso, 2021). As a result, many economic activities were forced to stop and billions of people have to stay at home. Thus, many people are left unemployed or have their income reduced, resulting in a significant loss of income for many people (Alon et al., 2020; Song & Zhou, 2020). The Covid-19 pandemic also caused 3.5 percent contraction in global GDP during 2020 (World Bank, 2021).

During 2021, many types of Covid-19 vaccines have been approved globally. The World Bank estimates that with the Covid-19 vaccination, the global economy may grow by 5.6% in 2021. However, due to the unequal distribution of vaccines among countries, the global economic recovery may not happen at the same time (World Bank, 2021). With the accelerated launch of the Covid-19 vaccines and large-scale financial support from the governments, the economy of high income countries are expected to recover quickly (Çakmaklı et al., 2021; World Bank, 2021). For middle income and low income countries, due to the slower pace of Covid-19 vaccination and the lack of financial support from the governments, the economic recovery in those countries are expected to be more sluggish (Alon et al., 2020; World Bank, 2021). Unequal distribution of the Covid-19 vaccines will not only harm middle income and low income countries, but also high-income countries and the rest of the world. From the healthcare perspective, the unequal distribution of the Covid-19 vaccines may cause the virus to mutate and jeopardize the efficacy of Covid-19 vaccines. Thus a renewal of even deadlier Covid-19 pandemic might still happen in the future, even in the high income countries. From the economic perspective, the global connectedness of world economy hint that the sluggish economic recovery in the middle income and low income

countries could also halt further economic recovery in the high income countries (Çakmaklı et al., 2021).

The previous researchs about vaccine inequality mainly discussed about socioeconomic inequality of vaccine administration among different groups in one country (Hawker et al., 2007; Crocker-Buque et al., 2017; Wondimu et al., 2020). However, for the first time the global Covid-19 pandemic presents a different condition, in which the vaccine inequality occurs not just in one country, but in the global setting. Due to the fact that the previous pandemics such as Spanish flu of 1918-1919, SARS epidemic of 2002-2004, and swine flu pandemic of 2009 could be brought under control without vaccination (Robinson, 2020; Vice News, 2021), the global Covid-19 pandemic became the first pandemic that need a global vaccination effort to stop it. Thus, the discussion of the unequal distribution of the Covid-19 vaccines became a novel discussion, and this served as the novelty for this research. The aim of this research is to investigate further about the inequality in Covid-19 vaccines distribution. This research further recommends several policy approach in order to help reduce the inequality of Covid-19 vaccines distribution. This research also aims to contribute to the evolving Covid-19 literature. The remainder of this research is structured as follows. Section Two contains a review of the literature; Section Three discusses the research method for this research, while Section Four contains the result and discussion of this research. Finally, Section Five provides a conclusion and recommendations of this research.

LITERATURE REVIEW

Covid-19 Vaccine

Since the creation of modern vaccines during the late 18th century, vaccines have been used to control and eradicate many contagious diseases, such as measles, tetanus, HPV, and chickenpox (Piper, 2021). Generally, vaccine development would gone through several stages, mainly:

- Pre-clinical stage: In the pre-clinical stage, the vaccine candidates are tested in a laboratory

environment, commonly on animals or human cells.

- Phase I trial: In the phase I trial, the vaccine candidates are injected to approximately 50 volunteers. The aim of this stage is to ensure that the vaccine is safe and not dangerous to humans.
- Phase II trial: In the phase II trial, the vaccine candidates are injected to hundreds of volunteers. The aim of this stage is to ensure whether the vaccine has a protective effect against the infection.
- Phase III trial: In the phase III trial, the vaccine candidates are injected to tens of thousands of volunteers. The volunteers are made up of different groups with varying immune system conditions. The aim of this stage is to ensure that the vaccine could protect every group of people, especially people with weak immune conditions (such as elderly or people with preexisting conditions).
- Phase IV studies: During this final phase, the vaccine that has been approved by health authorities and injected into ordinary people is evaluated (Matthews, 2020).

Today, as the Covid-19 pandemic is still raging around the world, vaccines are still the main tool to control and ultimately stop the Covid-19 pandemic. Therefore, pharmaceutical companies, with the help of universities and research institutions around the world, are scrambling to develop the new vaccines for Covid-19. In order to expedite the development of Covid-19 vaccines, a number of strategies have been adopted, such as using the latest technology in vaccine development, allocating a large amount of funds for Covid-19 vaccine research and development, expediting Phase II and Phase III stages, and producing the vaccine candidates that are still in phase II or phase III stages (Irfan, 2020; Matthews, 2020). Therefore, the development of the Covid-19 vaccines have brought a new record for vaccine development. In less than a year since the pandemic began, governments around the world have approved and issued Emergency Use Authorization (EUA)

for several vaccine candidates. The research and development for vaccines usually lasted more than ten years, with the previous record for the fastest vaccine development was held by vaccine for mumps that took 4 years for development and its approval in 1948 (Irfan, 2020; Irfan, 2020). In mid 2020, several countries have began approving several Covid-19 vaccine candidates. On 24th June 2020, China approved the limited application of CanSino vaccine for the military personnels (Pinghui, 2020). On 11th August 2020, Russia approved the indigenous Sputnik V vaccine for emergency use, and Russia became the first country to approve Covid-19 vaccine for public use (Kramer, 2020). On 2th December 2020, United Kingdom approved Pfizer-BioNTech vaccine for emergency use, and United Kingdom became the first high income country to approve Covid-19 vaccine for public use (Government of UK, 2021). On 11th December 2020, United States followed United Kingdom and approved Pfizer-BioNTech vaccine for emergency use (Thomas et al., 2020). By early 2021, several countries have approved multiple Covid-19 vaccines for emergency use (mainly Pfizer-BioNTech, Moderna, Oxford/Astra Zeneca, Sinovac, and Sputnik V vaccines), and mass injection of Covid-19 vaccine began around the world (McGill University, 2021). There are several types of Covid-19 vaccines that has been administered around the world, such as:

- Inactivated/live attenuated vaccines: These vaccines utilize older technology for vaccine development. These vaccines consist of inactivated or attenuated pathogens. With the introduction of inactivated or weakened pathogens inside the body, the immune system will become familiar with the pathogens, and can deal with the genuine pathogens in the future. Multiple Covid-19 vaccines are developed with this technology, such as Sinovac, Sinopharm, and Covaxin.
- MRNA (Messenger Ribonucleic Acid) vaccines: These vaccines utilize more advanced technology, therefore it can be produced faster than inactivated/attenuated vaccines. These vaccines contain a piece of mRNA that encodes a specific viral proteins into

a cell, specifically the spike protein of the virus. In this way, the immune system can become familiar with and prepare antibodies to neutralize the spike protein of the virus, and immobilizing the virus. Multiple Covid-19 vaccines are developed with this technology, such as Pfizer–BioNTech and Moderna.

- Adenovirus vector vaccines: These vaccines also utilize more advanced technology. However, instead of containing mRNA, these vaccines contain a piece of DNA that encodes the spike protein of the virus. Multiple Covid-19 vaccines are developed with this technology, such as Oxford/Astra Zeneca and Sputnik V (McGill University, 2021; Diamond & Pierson, 2020; Irfan, 2020).

RESEARCH METHOD

This research employs a qualitative methodology, and the relevant literature on this research is thoroughly reviewed. The information for this research is collected from the literature study, and further analyzed with qualitative method. To enable this, the data for this research was categorized and selected, before being linked to the problem to be studied in order to answer the problem of this research. The data was gathered through careful observation, specifically the analysis of the relevant documents and records. This qualitative study used inductive thinking, namely patterns of thought and ways of drawing conclusions that begin with a symptom and then progress to several facts, which later could be utilized as a generalization for the conclusions of this research (Cresswell, 2014).

RESULT AND DISCUSSION

The Covid-19 pandemic has not only caused a harsh health crisis, but also a harsh global economic crisis (Song & Zhou, 2020). In 2020, the global GDP has shrunk by 3.5%, and high income countries also suffered 4.7% reduction of their GDP. Middle-income countries also suffered 1.7% reduction of their GDP (World Bank, 2021). In order to control the spread of the Covid-19 virus spreads and to reduce the burden on the healthcare sector, many governments around the world initiated

lockdowns, issued stay at home orders, and restricted many economic activities. In turn, these several restrictions have led to sluggish economic activity or work stoppages, and resulted in massive loss of income for many people, increased poverty, and rising unemployment (Alon et al., 2020; Goolsbee & Syverson, 2020). Although the highincome countries endured greater economic contraction, the impact of economic recession was more severe in the middle income countries and low income countries. This is because high income countries have the ability to provide direct transfer payments and social insurance payments as a buffer for the loss of income and to support unemployed workers. For middle income countries and low income countries, these countries usually only have limited ability to provide that kind of supports, due to the smaller fiscal capacity in middle income countries and low income countries (Alon et al., 2020; World Bank, 2021).

Moreover, middle income countries and low income countries mainly rely on the informal economy and the micro enterprises. During the Covid-19 pandemic, the informal economy and the micro enterprises suffered more from the lockdowns, stay-at-home orders, or limitation of economic activities. Because of the loss of revenue and limited cash reserves, the informal economy and the micro enterprises could not afford to continue paying their workers and even forced to layoff their workers, causing massive loss of income for many workers in middle income countries and low income countries. Since there were limited remote works available in middle income countries and low income countries, many workers could not afford to work from their homes, and remain unemployed during the lockdowns and stay-at-home orders (Alfaro, et al., 2020). As a result, middle income countries and low income countries suffered a significant amount of unemployment and loss of income from the informal economy, with only limited capacity to support their people.

The harshness of the Covid-19 pandemic and its

profound impact on the global economy made it absolutely necessary to contain and end the pandemic as soon as possible. Vaccination became the main tool to end the Covid-19 pandemic. In the past, due to vaccination, several diseases have been contained or completely eliminated. Due to the large scale and sustained vaccination efforts around the world since, smallpox disease that has killed billions of people for centuries, was declared completely eliminated by the World Health Organization (WHO) during 1979. Other diseases, such as polio, also closed to be completely eradicated (Piper, 2021). Through the vaccination efforts, people will develop sufficient immunity against the diseases. Therefore, if sufficient people within the population are vaccinated, herd immunity will develop in the population. Thus, the diseases could not spread easily, and people who have not been vaccinated will also be protected from the diseases.

In the case of the Covid-19 pandemic, the Covid-19 vaccines can provide sufficient immunity against the Covid-19 infection. If majority of people in the world are vaccinated, the global population will have herd immunity, thus ending the global pandemic (Irfan, 2020). According to several researchers, the Covid-19 vaccine can protect from mild or moderate Covid-19 cases (ranging from 51 percent to 95 percent, depending on the type of vaccines), protect from severe Covid-19 cases (ranging from 84 percent to 100 percent, depending on the type of vaccines), and avert hospitalization or death due to Covid-19 (all types of vaccines can provide 100% protection from hospitalization or death). Therefore, in order to end the Covid-19 pandemic, it is necessary to establish coordinated vaccination efforts for Covid-19 around the world (Irfan, 2020).

Pharmaceutical companies, in collaboration with universities and research institutes worldwide, have successfully expedite and developed new vaccines for Covid-19. As of early of November 2021, 24 Covid-19 vaccines have been approved globally, with 155 vaccine candidates still in the

clinical testing stage, and another 495 vaccine candidates still in development stage. The main Covid-19 vaccines mainly used are Pfizer-BioNTech, Moderna, Johnson & Johnson, Oxford /Astra Zeneca, Sinovac, Sinopharm, and Sputnik V vaccines (McGill University, 2021). Covid-19 vaccines usually administered in 2 doses (with the exception of several vaccines, such as Johnson & Johnson, Convidecia, and Sputnik Light vaccines). Currently around 4.03 billion people or 51.2 percent of global population have been vaccinated, in which 883.5 million people or 11.2 percent of global population have been partially vaccinated (received 1 dose of Covid-19 vaccines), while 3.15 billion people or almost 40 percent of global population have been fully vaccinated (received 2 doses of Covid-19 vaccines). Around 7.25 billion doses of Covid-19 vaccines have been injected globally, while on average 27.23 million doses of Covid-19 vaccines are injected daily. So far, 212 countries or territories have started Covid-19 vaccinations, and only small number of countries that have not yet started the vaccination rollout (such as Eritrea) (Our World in Data, 2021).

Despite the fact that large majority of countries have started the Covid-19 vaccination rollout for their people, the portion of vaccinated people are distributed unevenly across the world, resulting in large inequality among countries. The portion of vaccinated people are predominantly concentrated in high income countries, with middle income countries still lagging behind high income countries in Covid-19 vaccination. Low income countries are in far worse condition because these countries only successfully vaccinated small number of people. As of early of November 2021, high income countries have injected 1.72 billion doses of Covid-19 vaccines, while middle income countries have injected 5.55 billion doses of Covid-19 vaccines, and low income countries only managed to inject 41.4 million doses of Covid-19 vaccines (Our World in Data, 2021). Despite having only 15 percent of global population (around 1.2 billion people), due to massive vaccination

rollout, high income countries have managed to vaccinate 878.13 million people or 72.28 percent of the population, in which 78.15 million people or 6.4 percent of the population are partially vaccinated and almost 800 million people or 66 percent of the population are fully vaccinated. Thus in high income countries, there were only around 336.7 million people or 27.72 percent of the population remain unvaccinated. On the other side, with 5.786 billion people or 75 percent of global population, middle income countries have managed to vaccinate around 3.12 billion people or almost 54 percent of the population, in which 792.44 million people or 13.8 percent of the population are partially vaccinated, and another 2.32 billion people or 40.2 percent of the population are fully vaccinated. Therefore, around 2.6 billion people or 46 percent of middle income countries population still remain unvaccinated. Low income countries are in the far worse condition. With 668.4 million people or 8.7 percent of global population living in low income countries, those countries only managed to vaccinate 27.94 million people or 4.2 percent of the population, in which 12.98 million or 1.95 percent of the population are partially vaccinated and around 14.96 million people, or 2.25 percent of the population are fully vaccinated. Thus, there were 640.46 million people or 95.8 percent of low income countries population that remain unvaccinated (Our World in Data, 2021; World Bank, 2021).

The inequality of vaccines distribution has caused significant differences in the condition of Covid-19 pandemic among countries. Almost all high income countries have successfully managed to vaccinate the majority or large portion of its population, and the majority of high income countries have successfully vaccinated more than 60 percent of their population. Only a handful high income countries that still not yet able to vaccinate the majority of their population, such as Croatia, Slovakia, Bahamas, and Trinidad and Tobago (Our World in Data, 2021). Thus for a lot of high income countries, the rapid and massive Covid-19 vaccination rollouts have caused significant drop in Covid-19 infections,

thus enabling these countries to ease or even lifted lockdowns and limitation of economic activities (Belluz, 2021; Çakmaklı et al., 2021).

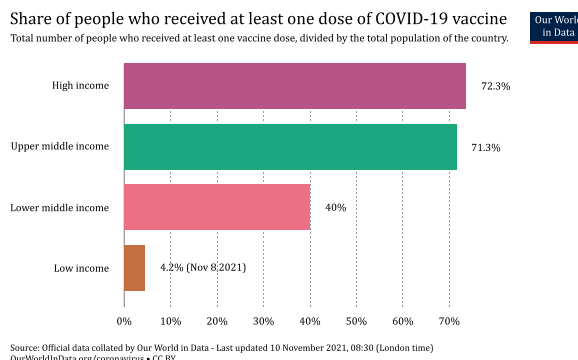


Figure 1. Percentages of Vaccinated Population According to Country Classification

Source: Our World in Data, 2021

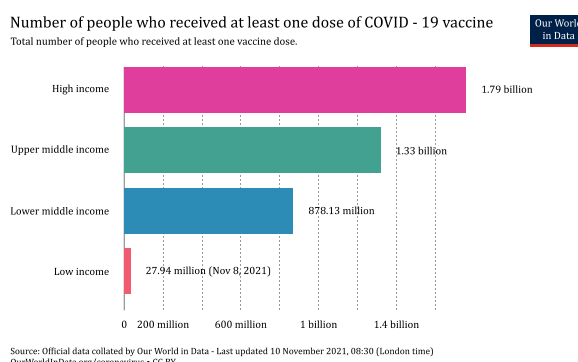


Figure 2. Number of People Vaccinated According to Country Classification

Source: Our World in Data, 2021

In middle income countries, many countries have successfully managed to vaccinate majority of their population. Several middle income countries have vaccinated between 70 percent to 90 percent of their population (Argentina, Malaysia, China, Cuba, Seychelles, Sri Lanka, Ecuador, Brazil, and Maldives). Some middle income countries also have successfully vaccinated between 50 percent to 69 percent of their population (El Salvador, Vietnam, Cambodia, Panama, Mongolia, Iran, Colombia, India, Cape Verde, Turkey, Morocco, and Belize). However, a large number of middle income countries have not yet vaccinated the majority of their population. Several middle income countries still only vaccinated between 30 percent to 49 percent of their population (Guyana, South Africa,

Kazakhstan, Tunisia, Serbia, Laos, Montenegro, East Timor, Paraguay, Indonesia, Jordan, Honduras, Russia, and Botswana). Many other middle income countries only able to vaccinate between 10 percent to 30 percent of their population (Nepal, Ukraine, Guatemala, Bosnia and Herzegovina, Lebanon, Nicaragua, Zimbabwe, Vanuatu, Tajikistan, Egypt, Angola, Iraq, Libya, Myanmar, Algeria, and Namibia). Other middle income countries only managed to vaccinate less than 10 percent of their population, mainly in the Africa continent (Ivory Coast, Papua New Guinea, Cameroon, Gabon, Senegal, Ghana, Benin, Nigeria, Djibouti, and Kenya). Therefore, it can be concluded that while middle income countries in Asia, Europe, and Americas tend to have a relatively good vaccination rollout, many middle income countries in Africa still lagging behind in Covid-19 vaccination (Our World in Data, 2021). The slower and unequal Covid-19 vaccination progress in many middle income countries, caused many middle income countries that left behind to struggle from the effect of the Covid-19 pandemic, both in the healthcare sector and the economic sector (Belluz, 2021; Çakmaklı et al., 2021).

While Covid-19 vaccination rollouts in middle income countries tend to in better condition, in low income countries Covid-19 vaccinations could be considered as slow, and even almost nonexistent. Rwanda remains as the only low income countries that have successfully vaccinated almost 30 percent of its population. Other low income countries only managed to vaccinate between 5 percent to 13 percent of their population (Uganda, Mozambique, Guinea, Guinea-Bissau, Togo, Gambia, Afghanistan, Liberia, Central African Republic, and Sierra Leone). Another low income countries only managed to vaccinate less than 5 percent of their population (Malawi, Syria, Ethiopia, Niger, Burkina Faso, Mali, Madagascar, Yemen, Chad, and South Sudan) (Our World in Data, 2021). Thus, compare to middle income countries, low income countries are in worse condition in terms of Covid-19 vaccination (Belluz, 2021; Çakmaklı et al., 2021).

The inequality of vaccines distribution could cause severe repercussions that might not only affect middle income countries and low income countries, but also high income countries. From the healthcare perspective, the inequality of vaccines distribution could cause further Covid-19 virus mutations. These mutations (such as Alpha, Beta, Gamma, and Delta variants) could reduce the efficacy of Covid-19 vaccines. With the large portion of population in middle income and low income countries still unvaccinated, Covid-19 virus has abundant opportunity to mutate itself. Thus, a renewal of the more contagious and deadlier Covid-19 outbreak is still possible to happen even in high income countries (Belluz, 2021; Çakmaklı et al., 2021; Irfan, 2020). From economic perspective, the interconnection of worldwide economy means that without economic recoveries in middle income countries and low income countries, the economies of high income countries cannot fully recover. This is because high income countries are significantly rely on export activities into middle income countries and low income countries. Thus, if the economy of middle income countries and low income countries could not recover sufficiently due to lower vaccination rate, the export activity in high income countries could still lagging. High income countries also rely on imports of raw materials, intermediate goods, and final goods from middle income countries and low income countries. Therefore if firms from those countries are not fully recovered from the pandemic effect, it could halt the supply chain activities from middle income countries and low income countries. These eventually will cause severe disruptions to economic activities in high income countries (Çakmaklı et al., 2021).

There were a number of factors that contributed to the inequality of Covid-19 vaccines distribution. Due to difficulties to scale up the Covid-19 vaccines production in such a short time period, for the short run Covid-19 vaccines tend to be in limited supply. There were also problems in the transportation process of the Covid-19 vaccines, especially in middle income

countries and low income countries, because the majority of Covid-19 vaccines needed to be refrigerated and these facilities sometimes were not always available in middle income countries and low income countries. However, these factors were further aggravated by Covid-19 vaccine hoardings by high income countries. These hoardings were possible due to the pre-purchase agreements among pharmaceutical companies and high income countries (Belluz, 2021).

The extent of Covid-19 vaccine hoardings by high income countries could be seen from the Covid-19 vaccines procurement. As of early of November 2021, around 7 billion doses of Covid-19 vaccines have been procured by high income countries, despite only around 1.2 billion people living in high income countries. Thus, there were 5.79 doses of Covid-19 vaccines for every people in high income countries. On the other hand, middle income countries only managed to procure more than 5.4 billion doses of Covid-19 vaccines, despite having 5.786 billion people. Therefore, there were 0.94 doses of Covid-19 vaccines for every people in middle income countries. Low income countries also only managed to procure 362 million doses of Covid-19 vaccines, despite having 668.4 million people. Therefore, there were 0.54 doses of Covid-19 vaccines for every people in low income countries (Duke Global Health Innovation Center, 2021). Since the majority of Covid-19 vaccines required two doses for every person, currently only high income countries and some middle income countries that have secured more than enough doses to immunize their entire population, while most middle income countries and all low income countries still do not have adequate doses for their population. Several high income countries also have successfully purchased large doses of Covid-19 vaccines, thus are able to vaccinate their population many times over and more than the requirement of 2 doses per inhabitant, such as Canada (11.41 doses per inhabitant), Australia (9.18 doses per inhabitant), The European Union (7.02 doses per inhabitant), New Zealand (6.67 doses per inhabitant), United Kingdom (6.46 doses per

inhabitant), United States (5.56 doses per inhabitant), Japan (5.42 doses per inhabitant), Chile (5.07 doses per inhabitant), Switzerland (4.76 doses per inhabitant), South Korea (4.6 doses per inhabitant), and Israel (4.53 doses per inhabitant). For middle income countries, only 10 countries who have successfully secured more than the requirement of 2 doses per inhabitant (Bolivia, Argentina, Thailand, Dominican Republic, Turkey, Morocco, Brazil, Malaysia, Sri Lanka and Peru), and the majority of middle income countries and low income countries still failed to secure enough doses for their people (Duke Global Health Innovation Center, 2021).

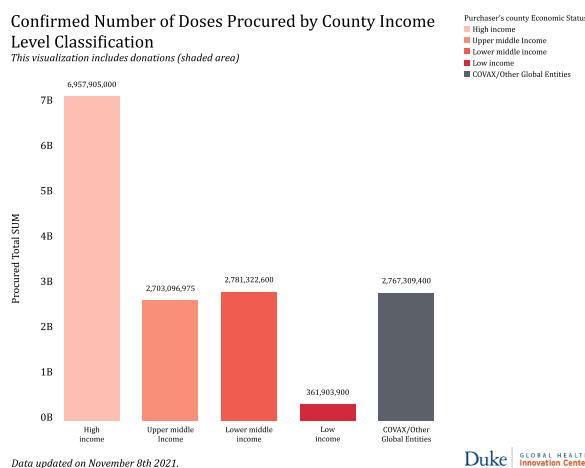


Figure 2. Vaccines Procurement According to Country Classification

Source: Duke Global Health Innovation Center

Pre-purchase transactions between pharmaceutical companies and high-income countries allowed high-income countries to stock up on the Covid-19 vaccine. Pharmaceutical companies needed a lot of money to produce the Covid-19 vaccine as soon as possible. Therefore, to secure the supply of Covid-19 vaccine, high-income countries are funding pharmaceutical companies through research grants and pre-purchase transactions. High-income countries also prefer to set up bilateral pre-purchase transactions with pharmaceutical companies to further secure the supply of Covid-19 vaccine. Many middle-income and low-income countries were usually unable to set up

pre-purchase transactions due to their limited financial capacity, as high-income countries secured a pre-purchase supply of the Covid-19 vaccine. Left behind. Therefore, these countries were forced to wait until high-income countries received the Covid-19 vaccine (Belluz, 2021).

The Covid-19 vaccines hoardings by high income countries were possible due to pre-purchase agreements between pharmaceutical companies and the governments of high income countries. To facilitate speedy production of Covid-19 vaccines, the pharmaceutical companies require a large amount of funds. Thus, to secure the supply of Covid-19 vaccines, high income countries decided to provide funds for pharmaceutical companies through research grants and pre-purchase deals. High income countries also decided to establish bilateral pre-purchase deals with pharmaceutical companies and pay the premium price for the vaccines. Because of these arrangements, many middle income countries and low income countries were left behind in the distribution of Covid-19 vaccines. This is because these countries could not afford to establish pre-purchase deals and pay the premium price for the Covid-19 vaccines, due to the limited fiscal capacity of middle income countries and low income countries. Therefore, those countries have no choice but to wait until high income countries have received their Covid-19 vaccines shipments (Belluz, 2021).

The COVAX initiative was actually launched to make it easier for middle income countries and low income countries to purchase Covid-19 vaccines, either directly from the pharmaceutical companies or through donations from other countries. COVAX will perform as an intermediary between the pharmaceutical companies and countries. As early of November 2021, COVAX itself had successfully secured approximately 2.7 billion doses of Covid-19 vaccines for middle income countries and low income countries. COVAX is also the world's largest purchaser of Covid-19 vaccines, followed by the European Union, India, the United States, Brazil and the African Union (Duke Global Health Innovation

Center, 2021). However, the pre-purchase agreements between the pharmaceutical companies and the governments of high income countries have largely undermined COVAX's efforts, due to the pharmaceutical companies prioritizing orders from high income countries, delaying the delivery of COVAX's Covid-19 vaccines to middle income countries and low income countries (Belluz, 2021; Duke Global Health Innovation Center, 2021).

The approach of Covid-19 vaccines distribution, which is predominately capitalistic and *laissez-faire* in nature, has caused inequality in the distribution of Covid-19 vaccines among countries. According to capitalistic and *laissez-faire* theory, only parties with larger resource endowments who could afford a larger goods distribution. Therefore high income countries with larger resource endowments (in the form of manufacturing technology and funding) for the production and procurement of Covid-19 vaccines, could afford to reap larger and highly prioritized shipments of Covid-19 vaccines with the pre-purchase agreements between the pharmaceutical companies and the governments of high income countries. For middle income countries, and low income countries who mostly lacks in resource endowments for the production and procurement of Covid-19 vaccines, could only afford smaller and least prioritized shipments of Covid-19 vaccines (Chapra, 2000; Karim, 2007).

Although there have been attempts to solve the inequality in the distribution of Covid-19 vaccines with intermediaries such as COVAX, or through humanitarian donations of Covid-19 vaccines from high income countries, unfortunately these efforts still largely failed to reduce the inequality of Covid-19 vaccines distribution (Belluz, 2021). To solve the inequality in the distribution of Covid-19 vaccines, it is important to strengthen the role of COVAX in the Covid-19 vaccines distribution. This is achieved by limiting the capability of the governments of high income countries to hoard Covid-19 vaccines. For this to happen, a strong

United Nations (UN) interventions and firm commitment from all UN members against the hoarding of Covid-19 vaccines is necessary. High income countries that have hoarded Covid-19 vaccines should also donate the surplus of their Covid-19 vaccines to middle income countries and low income countries, either bilaterally or through COVAX. For middle income countries and low income countries, it is necessary for these countries to intensify their diplomatic efforts for acquiring Covid-19 vaccines, either through bilateral channels, multilateral channels, or through UN forum (Dolatabadi & Kamrava, 2021; Amul et al., 2021). Another solution that could be considered are the temporary waivers of intellectual property (IP) protection for Covid-19 vaccines by high income countries. Through these waivers, middle income countries and low income countries could be able to produce their own Covid-19 vaccines (Nature, 2021). Through these several steps, hopefully in the foreseeable future the inequality of Covid-19 vaccines distribution could be reduced and the Covid-19 pandemic could be finally brought under control.

CONCLUSION

The Covid-19 pandemic has caused not only a harsh health crisis, but also a harsh economic crisis worldwide (Song & Zhou, 2020). Fortunately, new vaccines for Covid-19 have been successfully developed in the record breaking time. Even though almost every country have started Covid-19 vaccinations for its people, the Covid-19 vaccines distribution remains unequal between high income countries, middle income countries, and low income countries, with high income countries having secured large shipments of Covid-19 vaccines, while middle income countries and low income countries still mostly left behind (Our World in Data, 2021; Belluz, 2021). This inequality could cause severe repercussions in the form of further Covid-19 virus mutation, the

renewal of more contagious and deadlier Covid-19 outbreak, and also a slower recovery of the global economy, even in the high income countries (Belluz, 2021; Çakmaklı et al., 2021; Irfan, 2020). This inequality in turn is caused by the pre-purchase agreements between the pharmaceutical companies and the governments of high income countries. These capitalistic and laissez-faire arrangements cause middle income countries and low income countries to wait until high income countries have received their Covid-19 vaccines shipments, and also undermining the intermediary such as COVAX to distribute the Covid-19 vaccines to middle income countries and low income countries (Belluz, 2021; Duke Global Health Innovation Center, 2021). In order to solve this problem, it is important to strengthen the role of COVAX in the Covid-19 vaccines distribution by limiting the capability of the governments of high income countries to hoard Covid-19 vaccines. For this to happen, a strong UN interventions and firm commitment from all UN members against the hoarding of Covid-19 vaccines is necessary. High income countries that have hoarded Covid-19 vaccines should also donate the surplus of their Covid-19 vaccines to middle income countries and low income countries, either bilaterally or through COVAX (Belluz, 2021). Middle income countries and low income countries should also intensify their diplomatic efforts for acquiring Covid-19 vaccines. The temporary waivers of intellectual property (IP) protection for Covid-19 vaccines should also be considered, since these waivers would enable middle income countries and low income countries could be able to produce their own Covid-19 vaccines (Dolatabadi & Kamrava, 2021; Amul et al., 2021; Nature, 2021). Through these several steps, hopefully in the foreseeable future the inequality of Covid-19 vaccines distribution could be reduced and the Covid-19 pandemic could be finally brought under control.

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