

Ensuring the Fair Distribution of COVID-19 Vaccines Across Nations

Forum: World Health Organization

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Introduction

After COVID-19 was declared as a pandemic by the World Health Organization on 11th March 2020, the world faced the worst economic crisis since the great depression. The world has suffered from both direct and indirect impacts of the virus to varying extents. A new study shows that the world economy lost \$3.8 trillion and lost 147 million jobs worldwide. Under these



Vaccines

circumstances, the vaccine is expected to alleviate the seriousness of the pandemic. Experts believe that vaccines can help control Covid-19, even if they could not end the pandemic. Vaccines that have passed clinical trials are currently being supplied all over the world. While expectations and fears of vaccines coexist, problems with vaccine distribution arise. In some cases, the vaccine is distributed unfairly within the country, but it can also occur among other countries. As unfair distribution for individual or national interests can result in more significant damage, fair distribution of vaccines is strongly urged to reduce the damage of COVID-19.

Background

On 14 May 2020, the term "vaccine nationalism" was officially coined when the French pharmaceutical company, Sanofi, announced that it would first supply the United States with the most investment in vaccine development. After May, more economically developed countries began to purchase vaccines far exceeding the number of its citizens. These purchases have significantly reduced vaccines' accessibility in developing countries, raising concerns about the rising threat of vaccines. Vaccine nationalism is expected to not only reduce the accessibility of vaccines in developing countries but also create 1.2 trillion dollars of GDP loss annually worldwide. Although vaccine nationalism may be an inevitable choice as the Covid-19 is hurting many of its citizens and the economy of the nation; vaccines should be distributed equally from an economic perspective in the long run, not simply for world peace. According to Rand Europe, 25 billion dollars will be spent on providing vaccines to developing countries. However, if vaccines are not provided to developing countries, the damage to the UK, USA, EU, or other economically developed countries will be 119 billion dollars a year. If these advanced countries pay for the vaccine supply, the ratio of benefit to cost could be 4.8 to 1: those countries would get approximately 4.8 dollars back for every dollar spent. In order to ensure a fair distribution of vaccines, the distribution networks play an important role in addition to the financial status of a

country. According to the World Health Organization (WHO), in the case of inactivated virus, a Covid-19 vaccine developed by Sinopharm, China, should be stored between 2 to 8 degrees Celsius to maintain its effectiveness. In the case of a nucleic acid (mRNA) vaccine jointly developed by Biotech and Pfizer, it should be stored at minus 70 degrees Celsius, and the vaccine being developed by Moderna in the US should be stored at minus 20 degrees Celsius. Because the vaccines that use biomaterials such as proteins are sensitive to temperature, most vaccines lose their efficacy if they fail to maintain proper temperatures during the distribution process. According to the World Health Organization, up to 50 percent of vaccines could be thrown away due to the lack of proper temperature during the distribution process.

Due to these vaccines' nature that vulnerable to temperature, developing countries will have difficulty distributing them because they lack delivery technology, and few hospitals have the technology to store such vaccines properly.



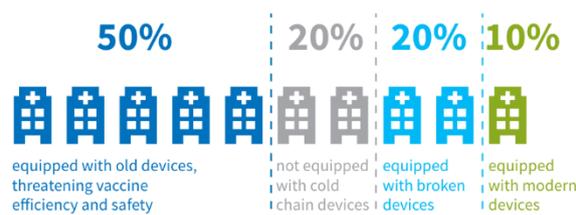
Problems Raised

Since vaccine distribution has only recently begun, many countries have faced several problems. Firstly, as vaccines for COVID-19 requires a very low-temperature environment for storage, a different distribution network from the existing refrigerated vaccine distribution network needs to be setup. One example could be a vaccine of Pfizer's, which needs to be kept at extremely cold temperatures under at least 70 degrees Celsius (or minus 95 degrees Fahrenheit). However, most countries, especially developing countries, are not ready to store these low thermostability vaccines because the cold chain system requires lots of cost and electricity. Secondly, like Pfizer's vaccine mentioned earlier, most of the vaccines on the market are less thermostable. It can hugely decrease the distribution for developing countries that do not have proper storage and delivery systems since less thermostable means it could be easier to be thrown away. Lastly, the most serious problem is that high-income countries have bought about 53% of the vaccine. Meanwhile, low and middle-income countries, which contain most of the population, have purchased just over 35%. Given that India accounts for the majority of vaccine purchases of low and middle-income countries, the actual amount of vaccine purchased by developing countries is likely to be much less than 35%.

Key Organizations

COVAX

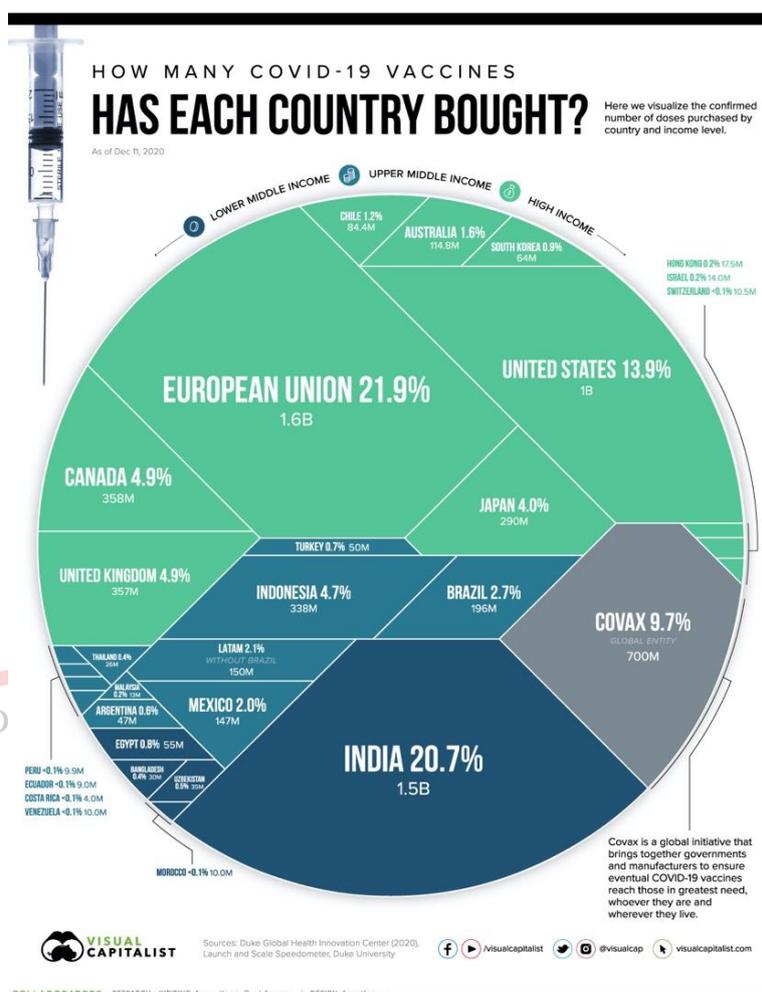
COVAX is a multinational coalition aimed at equalizing the supply of Covid-19 vaccines, centering on the World Health Organization (WHO), the CEPI, and the World Vaccine Immunization Association (GAVI). It



was established to ensure that vaccines are distributed fairly to developing countries that are unable to secure Covid-19 vaccines on their own in the global vaccine purchase competition. COVAX aims to evenly supply the Covid-19 vaccine to up to 20% of the world's population by the end of 2021. COVAX offers diverse vaccine doses for at least 20% of the countries' population. COVAX also offers vaccine delivery as soon as they are available.

Possible Solutions

As already mentioned, cold chains have become essential for vaccine distribution due to their low thermostability. The cold chain is necessary for the production, delivery, distribution of the vaccine, so a huge amount of electricity and cost is required. However, with an advanced cold chain, the vaccine could be distributed properly, and the number of vaccines discarded due to improper distribution will be effectively reduced. However, only a few countries and hospitals are equipped with modern devices that able to store and deliver vaccines appropriately. Therefore, it is recommended for advanced countries to financially support developing countries which are not established a cold chain system. Moreover, it is important to develop a more thermostable vaccine. As the vaccine becomes thermostable, it could significantly reduce the challenges during the distribution.



Glossary

Vaccine Nationalism: A situation in which countries push to get first access to a supply of vaccines, potentially hoarding key components for vaccine production

Thermostable: (of a substance) not readily destroyed or deactivated by heat.

Inactivated virus: vaccine consisting of virus particles, bacteria, or other pathogens that have been

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grown in culture and then killed to destroy disease producing capacity.

CEPI: Coalition for Epidemic Preparedness Innovations

GDP: Gross domestic product

Cold Chain: A cold chain is a temperature-controlled supply chain, which could preserve the consistent temperatures for refrigerated vaccines from manufacture through delivery to health care facilities.

Nucleic Acid Vaccine: Vaccine, which use genetic material from a disease-causing virus to raise levels of nervous activity in an immune response against it

Timeline

31 Dec 2019- A cluster of cases of pneumonia is reported in Wuhan, China

1 January 2020- World Health Organization had set up Incident Management Support Team (IMST)

13 January 2020 - The first COVID-19 case outside of China is confirmed in Thailand

11 March 2020 - World Health Organization declared COVID-19 as a pandemic

March 2020 - Moderna's mRNA-1273 entered clinic

April 2020 - COVID-19 had infected more than 1 million people.

April 2020 - Pfizer/BioNTech's Vaccine entered clinic

9 Nov 2020 - COVID-19 had infected more than 50 million people.

2 Dec 2020 – United Kingdom approved the Pfizer/BioNTech's coronavirus vaccine.

12 Dec 2020 – The US Food and Drug Administration (FDA) approved the Pfizer/BioNTech's coronavirus vaccine for emergency use.

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