

Forum: Human Rights Committee

Agenda: On measures to ensure equality in the process of distributing vaccines

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Introduction

For thousands of years, humans have been exposed to a variety of diseases. Diseases have certainly contributed to significant societal changes, especially with the introduction of greater commerce and travel. Only a century ago, the leading causes of death were outbreaks of infectious disease. Over time, scientists and physicians developed a method to protect our human species from disease using vaccines. Currently, vaccines can prevent a plethora of life-threatening illness, and immunization from vaccines have saved over 2-3 million children and countless lives globally.

According to the Centers for Disease Control and Prevention, vaccines have reduced preventable infectious diseases to an all-time low. Now few people experience the devastating effects of measles or other illnesses. Smallpox, a deadly disease plaguing humans for thousands of years, was eradicated through vaccination efforts, the Global Smallpox Eradication Program, launched in 1967. In addition, there are countless other infectious diseases mitigated through vaccinations: polio, MMR, HPV, and countless others.

Vaccine efficacy has saved numerous lives, yet unequal access to vaccines continues to threaten global health. Approximately 20 million people lack sufficient access to vaccines every year; ergo, 1.5 million people die annually from preventable diseases. Moreover, the proportion of children globally that received recommended vaccines has remained stagnant over the last few years; consequently, developed nations face serious challenges. Nearly 20 percent of children born annually in developing nations do not receive the necessary vaccinations as an infant. Many developing countries are not financially capable of purchasing expensive vaccines for their citizens. Currently, amid the COVID pandemic, vaccine equity is crucial to solving the current situation.

Key Terms

Infectious Disease

Infectious diseases are disorders caused by organisms — such as bacteria, viruses, fungi, or parasites. Many organisms live in and on our bodies. They're generally harmless or even helpful. But under certain

conditions, some organisms may cause disease. Some infectious diseases can be passed from person to person.

Vaccines

A vaccine is a biological substance designed to protect humans from infections caused by bacteria and viruses. Vaccines are also called immunizations.

Inoculation

The process of introducing an antigenic substance or vaccines into the body to trigger an immune response against a specific disease. In the early days, it was commonly practiced by blowing smallpox scabs into a person's nostril.

Variolation

The obsolete method of immunizing patients against smallpox by infecting them with substance from the pustules of patients with a mild form of the disease (variola minor). The disease then usually occurs in a less-dangerous form than when contracted naturally.

Antigen

A substance that can stimulate the immune system to produce antibodies. Bacteria, viruses, or fungi that cause infection and disease are example of antigens. Antigen has distinct surface features, known as epitopes, which results in specific resonsis.

Antibody

Also called as immunoglobulin, antibody is Y-shaped protein molecules produced by B cells of immune system in response to the presence of a foreign substance. The paratope inside each antibody recognizes specific epitope on an antigen, carrying our lock-and-key binding mechanism. The binding cause direct neutralization or "tag" other segment of immune system to eliminate antigens from body.

General Overview

Vaccine Equity

Vaccine equity is the belief that vaccines should be allocated equally amongst nations globally, irrespective of their economic or financial status. The UNDP states, "Access to and allocation of vaccines should be based on principles grounded in the right of every human to enjoy the highest attainable standard of health without distinction of race, religion, political belief, economic, or any other social

condition.” The slower rollout of COVID vaccinations specifically has left developing nations more vulnerable to newer variants or mutations, ergo leading to a slower recovery.

Availability of vaccines in developing countries

In developing nations, immunization levels are low, mainly due to high costs, lack of competition, research and development, weaker healthcare, or distribution processes. According to the WHO, creating a vaccine costs over \$500 million and takes more than 15 years, making it unaffordable for underdeveloped nations with weak economies. Infectious diseases in impoverished countries are not the same as those in developed countries. Clinical trials are challenging to undertake in developing countries due to a lack of infrastructure. Moreover, Developing countries face challenges when transporting vaccines. The study showed that one in five children, mainly in low-income countries, do not receive childhood immunization due to difficulties in logistics. Vaccines are more temperature-sensitive than other medical products, so reliable refrigeration is necessary. However, cold chain logistics are not fully available like developed countries due to a lack of infrastructure systems or the lack of electricity in some developing countries. Over the past decade, developing countries were able to gain greater access to vaccines by receiving support from other developed countries or organizations. Since 2000, the Vaccine Alliance was created to introduce vaccines to developing countries. Developing countries' governments rely on donors such as UNICEF and World Bank, as revealed by the recent vaccination effort during the COVID pandemic.

Availability of vaccines in developed countries

In contrast to developing countries, developed countries have high access to vaccines. Unlike the developing countries, the developed countries have the economic ability to afford new, expensive vaccines. The governments of developed countries provide financial supports for their people when vaccinated. For example, in France, vaccination is available for all residents, mandatory for children, with 70% of vaccination costs covered by public health insurance. The French government also pays great attention to spreading information about vaccination. A recent study showed that the United States, European Union had already confirmed purchase and secured the most significant potential doses. It is also stated that rich governments had already purchased about 80% of Pfizer's Covid-19 vaccine, equal to 1 billion doses. However, it only represents 14% of the global population. Due to its sufficient availability of vaccines, several developed countries partnered with funding organizations such as Gavi and Bill and Melinda Gates Foundation to provide financial support for developing countries.

Furthermore, developing countries have healthy refrigeration systems implemented with advanced transportation systems; it is easier to transport and receive vaccines.

Types of vaccines

Live attenuated vaccines

These vaccines add actual live pathogens into the body. However, the pathogens are weakened or attenuated before it is given so that it can stimulate the immune system without full infection. Because these vaccines carry living pathogens, they are not given to people with the weak immune system, such as people receiving HIV treatment or chemotherapy, who has a high risk of getting sick. Live attenuated vaccines result in life-long protection with only one or two doses. It is used in chickenpox, rotavirus, and MMR vaccine.

Inactivated vaccines

Inactivated vaccines contain an inactive version of a virus or bacteria, which has been killed with heat or chemicals, and its cells are introduced to the body. Inactivated vaccines are not as accurate as live attenuated virus, which requires several doses. Still, it is safer since the pathogens cannot reproduce and cannot mutate back to their disease-causing form. Polio, hepatitis A, and rabies vaccination contain inactivated pathogens.

Subunit vaccines

In subunit vaccines, only essential antigens of a pathogen that best stimulate a response are included. These vaccines can train the immune system with a low chance of adverse reaction and without provoking sickness. However, only certain vaccines can be produced this way since separating specific antigens is not always possible. It induces a weaker immune response. Subunit vaccines are used for hepatitis B, pertussis, and human papillomavirus (HPV) vaccines.

Toxoid vaccines

Some disease damages the body by secreting harmful products of bacteria, known as toxins. Vaccines for tetanus and diphtheria use toxoid, inactivated versions of toxins by mixing with formaldehyde and water to stimulate an immune response.

Conjugate vaccines

For bacteria that cause Haemophilus influenzae type B (Hib), it is coated with sugar molecules that conceal the antigens on their exterior, causing problems for the immune system to identify, especially in growing immune systems of children. Conjugate vaccines are used to link recognizable antigens to sugar-coated camouflaged bacteria, which the body's immune system can recognize and trigger immune response.

Vaccine development for Covid-19

Due to the rising figure of confirmed cases and deaths caused by Covid-19, people worldwide have been drawn to the development of the Covid-19 vaccine. In April, in response, WHO, in partnership with Gavi and CEPI, began the COVAX initiative to expedite up the development of Covid-19 vaccines. Its aim is to secure 2 billion doses by the end of 2021 and immunize up to 20 percent of the participant countries' population. As of October 19, 82 countries had joined the initiative and raised more than \$2 billion. Up to this point, COVAX had secured about 700 million doses of Covid-19 vaccines, far more than the U.K., Japan, and Canada. Furthermore, Pfizer and BioNTech presented the request to U.S. Food and Drug Administration (FDA) for Emergency Use Authorization (EUA) of their COVID-19 vaccine candidate. It will produce up to 50 million vaccine doses in 2020 and 1.3 billion quantities by 2021. The results of Phase 3 trials showed their vaccine was 95 % efficacious in inhibiting Covid-19 symptoms, without any adverse side effects.

*Major Organization/Parties Involved***World Health Organization (WHO)**

World Health Organization is a UN agency that works with 194 Member States. It funds and coordinates international programs that promote health, monitor disease, and track global health statistics. WHO's mass vaccination programs had hugely supported the eradication of smallpox in 1979 and a 99 percent decrease in polio infection. WHO is working with partners to increase the global vaccination coverage through "Global Vaccine Action Plan 2011-2020". Moreover, in response to the current Pandemic, the WHO has set a target "for all countries to vaccinate 10% of their populations by the end of September of 2021." However, 56 countries effectively excluded from the global vaccine marketplace were not able to reach this target – and primarily situated in Africa.

United Nations Children's Fund (UNICEF)

The United Nations Children's Fund works with governments, non-governmental organizations (NGOs), UN agencies, and initiatives to provide immunization to the children in need, build local capacity, and advocate for vaccination rights. UNICEF majority focuses on vaccination children in every community, disease eradication, creating demand for immunization through communication, innovation of new vaccines, and cold chain to make sure the vaccine gets reached to children." In 2019, UNICEF successfully secured vaccines to reach more than half of the world's children. UNICEF also established Vaccine Security Strategy to ensure a sustainable supply of affordable and quality vaccines.

Expanded Programme on Immunization (EPI)

Expanded Programme on Immunization was launched in 1974 by WHO. The goal of EPI was to increase vaccination rate among children in developing countries. By 1990, vaccination was protecting over 80% of world's children from six childhood disease: tuberculosis, polio, diphtheria, pertussis, tetanus and measles.

Bill and Melinda Gates Foundation

Bill and Melinda Gates Foundation is an American private foundation founded by Bill and Melinda Gates. It was launched in 2000 to provide technical and financial supports to those in need. To say, most of the organization and program's major support comes from Bill and Melinda Foundation. Along with Gavi, the Vaccine Alliance, they provided \$750 million to help provide vaccines across the world.

Global Alliance for Vaccines and Immunization (Gavi, the Vaccine Alliance)

The Global Alliance for Vaccines and Immunization was created in 1999 to expand the reach of EPI and help the poor countries to be introduced to new vaccines. Its major goal is to lower the vaccine prices for the low-income countries. The Alliance brings developing country and donor government, WHO, UNICEF, funding agencies and private sector partners together to actively support the ones in need financially. Since GAVI is launched, it immunized over 760 million children and prevented more than 13 million deaths.

Coalition for Epidemic Preparedness Innovation (CEPI)

Coalition for Epidemic Preparedness Innovation was launched in. CEPI is an alliance between governments, industry and other intergovernmental institute to “stimulate and accelerate the development of vaccines against emerging infectious diseases and enable access to these vaccines for people during outbreaks.” In 2020, CEPI was identified as “key player in the race to develop a vaccine” for Covid-19 disease. CEPI also invested in platform technologies that can be used for rapid vaccine development against unknown pathogens

Timeline of Events

1000s – Variolation, a primitive form of vaccines, was first developed in China and India. According to *The Life and Death of Smallpox*, Chinese Emperor K'ang Shi, who survived smallpox as a child, also had his children inoculated. But some claim the history of vaccines is dated as early as 200 B.C.

1796 – An English doctor, Edward Jenner, performed the world’s first vaccination. Given the observation that milkmaids who got cowpox didn’t show symptoms of smallpox, he inoculated cowpox pustule liquid from a milkmaid into a nine-year-old James Phipps’ arm. A few weeks later, Jenner inoculated smallpox on Phipps’ arm, but smallpox didn’t develop.

1803 – The smallpox vaccines were introduced to the Americas by the Balmis Expedition sent by the King of Spain.

1885 – Louis Pasteur, a French chemist, developed vaccines for rabies. He actually created a rabies antitoxin that was for a post-infection antidote. He used it to prevent the spread of rabies in a boy named Joseph Meister, who was bitten by a rabid dog.

20th century – Due to active vaccine research and development, vaccines for yellow fever, polio, whooping cough (pertussis), chickenpox, diphtheria, hepatitis A/B, measles, mumps, and rubella was introduced.

1974 – the WHO launched the Expanded Program on Immunization (EPI) to increase the vaccination rates among children in developing countries.

1980 – the WHO declared naturally-occurring smallpox to be eradicated by a mass vaccination program. Smallpox became the world’s first eradicated disease.

1991 – Polio was completely eradicated from Western Hemisphere.

21st century – Vaccines for rotavirus, human papillomavirus recombinant (HPV), and zoster was introduced.

2005 – Over 100 million children were immunized.

2020 – In response to the global Covid-19 pandemic, Bill and Melinda Gates Foundation granted more than \$350 million to support vaccine development

UN Involvement, Relevant Resolutions, Treaties and Events

- In 2005, the World Health Organization (WHO) and the United Nations Children’s Fund (UNICEF) published the Global Immunization Vision and Strategy (GIVS) to promote vaccination usage to protect children against 14 diseases (i.e., diphtheria, pertussis, tetanus, measles, polio, tuberculosis, hepatitis B, Hib, rubella, meningococcal disease, pneumococcal disease, rotavirus, Japanese encephalitis, and yellow fever). GIVS is “the first-ever ten-year Framework aimed at controlling morbidity and mortality from vaccine-preventable diseases and helping countries to immunize more people” The four main aims of GIVS are: to immunize more people against more diseases, to introduce a range of newly available vaccines and technologies, to integrate other critical health interventions with immunization, and to manage vaccination programs within the context of global interdependence.
- The United Nations Programme on HIV/AIDs (UNAIDS) and WHO established a new HIV Vaccine Initiative (HVI) to address the lack of vaccines for HIV/AIDS. The mission of HVI is to "promote the development, facilitate evaluation, and address future availability of preventive HIV vaccines, with a focus on the need of developing countries."
- On September 22, 2021, world leaders met at the U.N General Assembly to address the issues of vaccines distributions, discussing the implication of vaccine hoarding from developed nations, leaving the door open for future coronavirus variants. Critical points in the General Assembly include: "The Philippines warned of a "man-made drought" of vaccines in developing countries, Peru said international solidarity had failed, and Ghana lamented vaccine nationalism. The United Nations chief described the inequitable distribution of COVID-19 vaccines as obscenity."

Possible Solutions

Implementing a disease surveillance system

to effectively monitor the spread of vaccine-preventable disease and supply appropriate vaccines when needed. This would provide possible warnings of illness outbreaks and gather the impact of disease control programs for development purposes. Strengthened surveillance systems will provide disease data needed for immunization initiatives and monitor the effects of new vaccines. The data collected will also tell what type of vaccines should be applied in an area.

Creating organizations, programs, and agencies

Creating governmental organizations, initiative programs, or public funding agencies can provide vaccines for less developed countries (LDCs). It will improve the vaccine supply, vaccine delivery system, and their availability to LDCs by providing adequate access to affordable vaccines and promoting vital immunization programs at the local level. International organizations can encourage communication and cooperation between countries, which can support less developed countries in need of vaccine supply. Funding from organizations or agencies can invest in the research, development, and production of new vaccines against new diseases. The parties should increase the sustainability and cost-effectiveness of vaccine supply.

Creating self-sufficiency

By investing capital in developing nations willing to expand their abilities to create vaccines, developing countries can develop vaccines locally, reducing prices resulting from logistics. Moreover, with vaccine technology, developed nations can share vaccine technology with developing nations to hasten the process of vaccine creation. In addition, training programs could be instituted at top medical programs or pharmaceutical corporations in developed countries to allow medical professionals from developed nations to garner the necessary skills. Through this effort, with the capital and human capital, vaccine supply in developing nations can be more stable and positioned better for future outbreaks or mutations.

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