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Global Distribution of COVID-19 Vaccine: Mine First

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Abstract: The COVID-19 (SARS-CoV-2) pandemic dealt a severe blow to society as a whole and required countries to confront a situation that exceeded the limits of their borders. In this paper, we analyze how these countries as well as supranational organizations responded to this unprepared global emergency. We also explore what alternative models have been proposed in the wake of this crisis and propose some changes—other ways of acting—so that in future pandemics or global emergencies, we can deal with the situation more effectively.

Keywords: COVID-19; public health ethics; equity; distribution; allocation; vaccine

1. Introduction: Global Rationing of the COVID-19 Vaccine

On 9 December 2020, barely a year after the first COVID-19 pneumonia was diagnosed in Wuhan, China, the first dose of a SARS-CoV-2 vaccine approved by US and European regulatory agencies was administered in the UK. Although three different vaccines were available in early January 2021, their limited production could not guarantee the recommended two doses for all people at risk until the end of 2021. Therefore, in the global distribution of COVID-19 vaccines, we must differentiate between two distinct stages: firstly, from the approval of the first vaccine until the end of 2021, when the supply of doses was lower than the demand and therefore had to be rationed, and, secondly, from the end of 2021 onwards, when the supply was able to meet the demand and international solidarity initiatives were launched to make vaccines available to countries that could not afford to pay for them. In the first period, high-income countries competed in spending and influence to obtain doses of the vaccine and managed to immunize within a few months all those citizens who wanted to be vaccinated. Simultaneously, countries that could afford the vaccine but lacked the leverage to obtain it, and countries that could not afford it endured new waves of the disease and numerous associated deaths.

Although data on vaccination in low-income countries are limited, one-third of all COVID-19 deaths in Libya, Ethiopia, or Egypt occurred between September 2021 and January 2022, when vaccines were no longer an issue in high-income countries [1]. At that time, these countries were reaching average vaccination rates of 72%, limited only by a part of the population reluctant to vaccinate, and were starting to administer the third dose and vaccinate the population under 12 years of age [2]. In contrast, low-income countries barely reached an average of 5% of the population with at least one dose [3].

When we talk about vaccine distribution, we are talking about distributive justice and we must answer two questions: on the one hand, how it is distributed, i.e., what values, principles, and criteria guide the distribution, and on the other hand, among whom it is distributed [4]. The governments of the various countries, with the acquiescence of the majority of international institutions, have answered the second question by placing the limit on national borders and the citizens of their states.

The COVID-19 vaccine is just one of the examples that have abounded in this pandemic of the unequal global distribution of resources among states. Diagnostic tests, protective

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materials, ventilators, and masks were almost anecdotally available in low-income countries while there were shortages in high-income countries [5,6].

In this paper, we address several issues. First, we describe how the COVID-19 vaccine was distributed globally. Second, we address the ethical conflicts that this distribution generated. Finally, we point out some lessons that we have learned in this crisis and that we can transfer to similar situations that may occur in the future (an undesirable but not unrealistic event).

2. COVID-19 Vaccine Distribution

The richest countries in the world secured more than 2 billion doses through binding contracts with pharmaceutical companies even before the first vaccines were approved [7] to the extent of gathering up to five times more doses of the vaccine than citizens in their countries. This hoarding of doses led to a de facto blocking of access to the vaccine by the most disadvantaged countries [8].

The predominant distribution criteria in the global distribution of the COVID-19 vaccine were the ability to pay for the vaccine and the ability to exert international political influence to obtain it [9]. This form of distribution has been termed vaccine nationalism, i.e., intra-national distribution governed by country-specific criteria, usually based on need, and inter-national distribution based on market and political influence [10,11].

Some exceptions to vaccine nationalism emerged from international initiatives such as the COVAX project, managed by the WHO, or the donation of vaccines to Africa by countries such as China [2].

WHO, through the Vaccine Alliance, with the Coalition for Epidemic Preparedness Innovations (CEPI), vaccine manufacturers, the private sector, governments, civil society, and philanthropy created the COVAX initiative, aimed at providing vaccines globally and equitably. The COVAX approach was to protect those most vulnerable to severe disease and exposure to infection—especially healthcare workers—through a global distribution of vaccines to all countries of the world, whether they could afford to pay for them or not. The goal in the first phase was to have approximately 20% of the world's population vaccinated by the end of 2021 and to ensure that the 92 low-income countries would have equal access to the vaccine, at least for that 20%. In a second phase, vaccines would be distributed according to the needs of each country [2,8,12–16].

Therefore, the main beneficiaries of COVAX were to be low-income countries that could not afford the vaccine and middle-income countries that could afford the vaccine but had not secured direct agreements with the pharmaceutical industry for priority supply. It was also beneficial to high-income countries because it ensured the development of a greater number of different vaccines by reducing the risk of investing in a single vaccine. In addition, it made it easier for the pharmaceutical industry to produce enough doses for everyone, not just for high-income countries. On paper, no country would receive more than 20% of doses until all 92 funded countries received doses for 20% of their population [2,17].

Since the launch of the initiative, many high-income countries have already refused to commit to obtaining their vaccines through COVAX, although they did commit to donating doses when they could. This foreshadowed that vaccines would only come to COVAX when high-income countries had immunized their populations, which would imply the failure of the initiative. Ultimately, this was the case: by the end of 2021, COVAX had shipped 738 million doses to 144 countries, a far cry from the 2 billion they were forecasting a year earlier. Most high-income countries obtained their vaccine doses through bilateral agreements with the pharmaceutical industry, independently and even competing against COVAX [2].

Another form of vaccine delivery alternative parallel to vaccine nationalism has been vaccine diplomacy. In November 2021, China promised the delivery of 1 billion doses of SinoVac vaccine (at that time, still unlicensed by EU, UK, and US regulatory agencies) to African countries, 600 million donated and 400 million in co-production between China

and African countries [18]. This act was labeled as a geopolitical strategy to increase the area of influence of the Asian country.

Not only China with its donations to African countries but also Pakistan and Cambodia have also tried to expand their influence through the vaccine. India, which donated its doses of the AstraZeneca vaccine to Bangladesh, Myanmar, and Nepal, and Israel, which bought doses of the Russian vaccine, Sputnik V, to donate to Syria, have also acted in the same manner [19].

3. Problems in Recipient Countries and Other Lessons for the Future

Vaccine nationalism has been defended from partial values such as the duty to protect one's own nation's citizens and to consider one's fellow citizens as a priority [20]. However, the pandemic has underscored the value of the interrelatedness and interdependence of both people and nations within a globalized world [21]. COVID-19 has time and again pointed out the futility of national strategies for pandemic control that did not take into account this interdependence with other nations and which has been synthesized in phrases such as the one contained in the COVAX initiative: "No one is safe until everyone is safe" [12]. An analogy can be drawn between this problem and the issue of climate change, which is very topical in our time and which does similar damage. Although the richer countries are making efforts to combat it with zero-emission and pollution reduction policies, global action is needed to tackle it. Climate problems affect the entire population equally, and we must seek, as with COVID-19, an international strategy to prevent or at least mitigate the climate disaster.

If the current economic-social system develops in a global framework, with a distribution of burdens and benefits that tends to disadvantage low-income countries, the distribution of the SARS-CoV-2 vaccine cannot be based on purchasing power and influence. From an equitable perspective, a life-saving resource cannot be rationed based on a nationality criterion [15,17]. Moreover, nations have relationships that generate reciprocities and supranational institutions, which also calls into question vaccine nationalism [13]. We face the pandemic collectively and this requires equity, solidarity, and reciprocity, and these principles cannot be applied to a nation-state scale [22].

Distribution based on the purchasing capacity of each country is inequitable because it favors the most favored, i.e., high-income countries that could afford it and were allied with the industry for a priority supply [11]. These countries, moreover, were endowed with strong health systems and the capacity to respond equitably and efficiently to the pandemic and were able to hoard indispensable resources such as drugs, diagnostic tests, and protective equipment.

The COVAX initiative, as an escape from vaccine nationalism, has failed in its attempt at global distribution based on equity and solidarity and has ended up in a model based on the charity of rich nations through donations of leftover doses [23]. Even its strategy of equal distribution to reach a minimum of 20% of the population of each country did not take into account the specific needs of each nation and could therefore not be equitable [13,16]. COVAX has failed to meet its objective and may even have given a license to inequitable access to the vaccine by institutionalizing these inequalities, knowing that they are unjust.

Vaccine diplomacy can be seen as an opportunistic way to accumulate soft power without the ultimate intention of promoting equity. Rather than a solution to inequity, it becomes an ethical problem if diplomacy does not have behind it a broad international project concerned with global health. A project in which the primary interest is the health of all and not the geopolitical objectives of the donor nation [19].

However, there more than one problem with the distribution of the vaccine among the different countries. Once the situation was under control in high-income countries and they were willing to donate doses to low-income countries in an act not of solidarity but of charity, we ran into an equally important problem: the issue of capacity in vaccine distribution and delivery. The distribution of the COVID-19 vaccine has involved significant and continuous use over time of many resources such as specialized transport and storage of the doses, or

the simultaneous availability of trained health personnel to administer the vaccines and administrative staff to manage demand. Moreover, when a country has precarious health infrastructures, the detour of resources to vaccination can have repercussions on the health of the population by neglecting other health areas—this happened in Congo in 2019 during the Ebola epidemic that forced the neglect of measles vaccination generating, paradoxically, more deaths from measles than from Ebola [24].

Thus, at the end of 2021, the availability of vaccines allowed for the possibility that all those who wanted to be immunized could be immunized in most low-income countries the vaccination figures barely progressed despite the availability of many more doses. The truth is that vaccination is not just a question of vaccine availability but also of the capacity to administer vaccines and the health infrastructures that allow for it. It was not just a problem of lack of opportunity but also a problem of lack of capacity to take advantage of it [17].

3.1. Vaccine Patents: What We (Did Not) Learn from the Distribution of Antiretrovirals

One of the issues to be resolved for future public health emergencies is the patenting of health technologies such as vaccines. This is an old problem that takes us back to the HIV/AIDS pandemic at the end of the last century. At that time, problems were already evident in the global distribution of antiretroviral drugs that managed to turn HIV/AIDS from a rapidly fatal disease into a chronic pathology. The unequal distribution of these treatments meant that countries that could not afford them, mostly in Africa, bore a greater burden of the disease and death associated with it [25,26]. In an attempt to reduce this inequality in access to antiretrovirals, the agreements on "Trade-Related Aspects of Intellectual Property Rights" (TRIPS) of the World Trade Organization were reached [27]. Their objective was to make the interpretation of intellectual property more flexible in a situation of public health emergency, as was the case with HIV/AIDS. However, the distribution of HIV/AIDS drugs has been conditioned to the charity of some pharmaceutical companies and NGOs without including equity criteria [28].

Patents on COVID-19 vaccines pose an access limitation for low-income countries because they prevent the manufacture of vaccines without permission from the patent holder. Patents are an administrative instrument of knowledge management that can serve as an incentive for innovation, but they cannot become an insurmountable barrier to access for a large part of the population to an innovation that can have significant consequences on individual health and community health, especially when the development of vaccines has been mostly funded by public investment: doing science involves many actors and not just the interests of one of them should be protected [2,22,23]. Vaccines are not just any pharmaceutical product: their impact on public health is much greater than that of any other single-use drug, so the consideration of patent exemption is much more justified [29].

3.2. International Governance: Who Makes the Decisions and the Role of WHO and International Institutions

Administering at least two doses of vaccine to 8 billion people worldwide is a task of such magnitude that it requires the synergy of national governments and international institutions as well as the design of global governance [14]. However, the role of WHO, the main international health institution, has been that of a mere consultant and issuer of recommendations that have been unevenly followed up.

The only expression of global vaccine governance has been the COVAX initiative, which can be described as a laudable effort considering the given circumstances and the weakness of international institutions with a very limited structure and executive capacity. In addition, the global political context is very favorable to vaccine nationalism and to prioritizing national interests, which made the success of the initiative unlikely [16]. Although the absence of COVAX would probably have determined an even more inequitable, COVAX can be considered a failure, not only because it did not achieve its objectives but also because it did not take into account the aforementioned issue of capacity [30,31].

4. Proposals for a Global Equitable Distribution of the Vaccine

Equitable distribution of the vaccine can be defined as one that is based on need, i.e., treating equally those who are in equal conditions of need, benefiting those who are disadvantaged by the pandemic, and avoiding systematic discrimination based on irrelevant criteria such as sex, ethnicity, etc. [13,32]. This distribution that considers need regardless of nationality and that prioritizes the vulnerable without discriminating based on country of origin[1], is in line with Rawls' principle of difference [33].

The WHO vaccine allocation proposal published in September 2020 [34], when the development of the first vaccines had not yet been completed, considered prioritization of people vulnerable to severe disease (over 65 years of age or with comorbidities) as well as those with greater occupational exposure to the disease and a social value to be protected (health workers). These were, with national nuances, the main criteria for vaccine prioritization in most countries. However, extending these criteria to global vaccine distribution would be problematic because the prioritized population (65+ and healthcare workers) is significantly more abundant in high-income countries than in low- or middle-income countries, so again, high-income countries would benefit from the distribution. In addition, the lack of health workers in poor countries is already a weakness that must be taken into account in the distribution [13].

Therefore, although these distribution criteria are relevant, other criteria that take into account the specific vulnerabilities of the population of disadvantaged countries are being ignored, such as (1) the precariousness of the health system that makes the vaccine the only recourse against the pandemic and (2) poverty rates that determine social, economic, and political conditions that worsen the individual and community consequences of the pandemic. Any global vaccine distribution that does not take into account these prior inequalities will only exacerbate health inequities [9,15,17].

Examples of criteria that take into account health inequities can be drawn from some of the models proposed during the pandemic. In their proposal called the Fair Priority Model, Emanuel et al. [13] set out criteria that can capture these specific vulnerabilities such as (1) reducing premature deaths, for example, by prioritizing vaccination for countries that can avoid the most years of life lost prematurely, and (2) reducing severe socioeconomic deprivation, by prioritizing countries that can most reduce poverty. On the other hand, the vaccine prioritization model proposed by Jecker et al. [17] also contemplates criteria centered on socioeconomic conditions such as giving (1) priority to countries with low capacity to obtain vaccines due to their economic conditions; (2) prioritizing areas with a high risk of infection: high population density, precarious conditions of sanitation, drinking water, work, overcrowding, etc.; and (3) high risk of serious disease or death: comorbidities, aging population, and insufficient health resources.

Regarding patents, there are two alternatives for circumventing vaccine intellectual property and favoring vaccine manufacturing: (1) licensing or exchanging intellectual property rights over vaccines such as WHO's C-TAP or (2) suspending intellectual property rights for the technology around COVID-19 under the proposed TRIPS exemption as was done for antiretrovirals [2]. India and South Africa submitted to the WTO a proposal for a temporary global TRIPS exemption for the COVID-19 vaccine [35] that is supported by most low-income countries and opposed by high-income countries such as the European Union. This exemption is key to equitable access to the vaccine. In any case, pharmaceutical profits from COVID-19 vaccines are exceptional [2,29].

Finally, in relation to global governance, it is essential to crystallize the values of equity and global solidarity in international institutions. This implies a reform of international public health institutions to strengthen global health governance through reflection and forecast about future global vaccine rationing, as well as other scarce health resources and the capacity for their use in countries with a precarious healthcare infrastructure. It also requires the generation of an international legal basis that lays the foundations for future pandemic care, such as financing or executive capacity [19,36].

However, not just these criteria can be applied as alternative models in the equitable distribution of the vaccine. This type of equitable distribution can also be defended by the principles of reciprocity and efficiency.

4.1. Equity and the Principle of Reciprocity

In 2006, Australia developed an influenza vaccine using samples supplied by Indonesia without consent. This led Indonesia to stop sharing virus samples with the WHO, which deteriorated global viral surveillance. This situation highlights two key issues: (1) the interdependence between nations discussed at the beginning of this section and (2) how low-income countries contribute to the development of vaccines from which they do not subsequently benefit, i.e., they are good as research subjects but not so good as objects of sharing [9].

Equity implies risk sharing and not just benefit sharing, and here too, there has been inequitable sharing. Research for the development of COVID-19 vaccines was also conducted in low-income countries. Moreover, when high-income countries were massively vaccinated, there was no population left on which to evaluate new vaccines, so research was directed to low-income countries with low vaccination ratios. The potential risks of research have been directed to low-income countries so that profiting from unfair inequity also becomes inequity [37–39]. It is a win–win inequity: low-income countries participate in the development of vaccines by assuming their risks without then receiving the benefits because they cannot access the vaccines, which generates an inequity that high-income countries take advantage of to develop new vaccines.

Reciprocity, as recognition of low-income countries for their participation in vaccine development, is also an argument for equitable vaccine distribution globally: if the entire world population bears the risks of vaccine development, the entire population should benefit from the resulting vaccines [9,15].

4.2. Equity and the Principle of Efficiency

Infectious diseases do not respect the borders drawn by states and not acting globally is a risk for all. The very evolution of the COVID-19 pandemic is an example: a virus identified in a remote region of China collapsed hospitals and morgues all over the world in less than three months. Additionally, the same was repeated with the Omicron variant in January 2022, even though we already had vaccines and natural immunity. Equitable distribution recognizes an incontrovertible fact: our individual and collective interdependence. It is impossible that public health threats such as a pandemic can be managed nationally by closing borders and without considering the global dimension [17], especially if we intend to remain interconnected economically and socially.

With mathematical models of distribution, it was possible to draw two scenarios before the introduction of vaccines, assuming 80% effectiveness: (1) if it were distributed first in high-income countries, it would prevent 33% of deaths, and (2) if it were allocated equally and proportionally among the global population, it would prevent 61% of deaths. Therefore, the most equitable distribution is also the most efficient in maximizing outcomes [40].

The tragedy of the commons argues that partial rational decisions can be disastrous for community interests [41]. In an application of this theory to the global situation of COVID-19 vaccine distribution, we can conclude that the rational decision of national governments to hoard vaccines in a situation of scarcity for the priority benefit of their citizens has been a failure to control the pandemic globally and has resulted in the emergence of new variants with unpredictable consequences, also in highly vaccinated countries.

Leaving large areas unvaccinated, as was the case in Africa, in an interconnected and globally mobile world means creating a gigantic reservoir for the virus in which it can replicate uncontrollably and encourages the danger of mutations that escape the vaccine or become more virulent and hinder the final control of the pandemic. Indeed, one of the variants that quickly spread throughout the world when high-income countries were already vaccinated, Omicron, most likely originated in Africa. In other words, global

equitable vaccination is also the most efficient strategy to avoid new, more contagious, or virulent variants and to control the spread of epidemic outbreaks. In an interconnected world with continuous population movements, the idea of fighting a pandemic efficiently with local interventions is illusory. It is not only low-income countries that benefit from equitable sharing: the whole of humanity does [14,17,37].

5. The Question of Capacity

Vaccines are a health improvement opportunity that requires a minimum infrastructure for distribution and administration. Countries without a well-structured and consistent health system cannot efficiently vaccinate their population, even if the vaccine is available [15].

Efficient distribution of the vaccine can lead to applying the criterion of internal distribution capacity shown by a country and to de-prioritizing countries with a precarious health infrastructure as a futile use of the vaccine [9,13,15]. However, the low capacity or willingness of a country to distribute vaccines within its borders cannot be the criterion applied in the framework of equitable distribution [17].

Therefore, any global equitable distribution of the vaccine must evaluate the distribution capacity of the country and must be accompanied by sufficient supervision so that the vaccine can be distributed internally in an adequate way. In this regard, it is interesting to note that the development of new vaccines should focus on those with better transport and preservation capacity [13]. Additionally, this should also be a lesson learned from the pandemic: the convenience of developing basic health capacities in countries that lack them [9,17].

6. Limitations

Our proposal brings some novelties regarding how to distribute the COVID-19 vaccine in a more equitable way globally; however, we assume our limitations: the deepening in detail of, on the one hand, how to constitute and articulate international institutions with executive power in future pandemics and, on the other hand, how to make an equitable and efficient management of vaccine patents require explanations of international law that exceeds the objectives of this paper.

7. Conclusions

Throughout this paper, we have tried to show some of the keys to why we have erroneously approached the COVID-19 crisis as a global society. Once again, high-income countries have hoarded market opportunities, taking advantage of their influence and economic power to obtain vaccines over low-income countries. This approach—vaccine nationalism—is not only unsupportive but also inefficient. No country or region should bear the brunt of the global shortage of health resources, and certainly, no overtly nationalistic strategy should govern the interests of a global society.

Unlike in other crises, during this pandemic, national individualism, resource hoarding, and the imposition of influence have only served to further prolong the pandemic in high-income countries (with recurrent new waves of the disease) and to cause millions of deaths in low-income countries. It is necessary to establish a new model for dealing with future situations of a similar nature: we must establish strong international governance based on empowered institutions with power of decision and action in public health emergencies, with funding and independence, and with the obligation to foresee future crises. It is also necessary to expand collaboration seriously, so that laudable initiatives such as COVAX are not relegated to an irrelevant or sometimes counterproductive role. Finally, we believe that it is essential to exempt health technologies such as vaccines, which have a major impact on general health, our individual health, that of our community, and global health, from intellectual property.

Going back to the phrase contained in the COVAX initiative: “No one is safe until everyone is safe”.

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Note

[1] The theory of justice as fairness is fundamentally based on two principles: On the one hand, all people should be equally entitled to the greatest range of basic individual freedoms, provided that this range is compatible with the freedoms of others (principle of liberty). On the other hand, social and economic inequalities involves positions accessible to all under conditions of fair equality and opportunity, and these conditions should be greater for the most disadvantaged members of society (principle of difference). Within these principles, the first takes precedence over the second and the second part of the second principle takes precedence over the first. This means that the freedoms ensured by the first principle cannot be traded for greater economic advantages. Economic inequalities must be based, for their part, on the principle of fair equality of opportunity.

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