philosophies

MDPI

Article

'Prioritized Distribution of Equal Shares'—An Ethical and Practicable Allocation Framework for COVID-19 Vaccines

Lina Corinna Heuberger *,†, Sophia Forster † and Andreas Frewer

Institute of Medical Ethics, Friedrich-Alexander-Universität Erlangen-Nürnberg, 91054 Erlangen, Germany; sophia.forster@fau.de (S.F.); andreas.frewer@fau.de (A.F.)

* Correspondence: lina.lh.heuberger@fau.de

† These authors contributed equally to this work.

Abstract: In the context of the global COVID-19 pandemic, the fast and equitable distribution of effective vaccines worldwide is one of the challenges faced by international institutions in charge, as global equity in vaccine supply has not yet been achieved. Our paper explains the current state of ethical research on equity in global COVID-19 vaccine allocation, focusing on the COVAX Facility established by the WHO, acting as the global vaccine distributor. The article presents a detailed analysis of the first year of COVAX allocation in 2021 identifying problematic aspects of its allocation framework regarding the implementation of COVAX's fundamental allocation principles. We argue that the COVAX Facility has developed a proper concept to deal with global vaccine allocation—but to address uncovered defaults, we introduce the 'Prioritized Distribution of Equal Shares' model—a both ethical and practically feasible alternative allocation framework to protect the value of human lives in both high- and low-income countries through fair and fast global vaccine distribution in health emergencies. Nonetheless, we argue that the COVAX Facility remains the main organization to provide equitable access to vaccines. Yet, the global community has to consider further aspects such as patent protection, vaccine production and the lack of power of global structures to address the inequities that have arisen. Since new wars and further crises have arisen, a shift in public global attention endangers the processing of COVID-19-related issues. That is why now more than ever extensive efforts to achieve vaccine equity are needed.

Keywords: COVID-19; allocation; vaccine; COVAX; distributional justice; global health ethics; human rights

Citation: Heuberger, L.C.; Forster, S.; Frewer, A. 'Prioritized Distribution of Equal Shares'—An Ethical and Practicable Allocation Framework for COVID-19 Vaccines. *Philosophies* **2023**, *8*, 24. https://doi.org/10.3390/philosophies8020024

Academic Editor: Gordana Dodig-Crnkovic

Received: 13 January 2023
Revised: 1 March 2023
Accepted: 8 March 2023
Published: 10 March 2023

1. Introduction

By the end of 2021, the first year of allocation, the global society had to face the controversy of whether to administer the third dose of the COVID-19 vaccine in the first world or the first dose in the third world. At the same time, the Omicron virus mutation continued to spread, intensifying the debate on the global distribution of the scarce resource of COVID-19 vaccines. Since April 2022, COVAX has had enough vaccine doses at its disposal to provide deliveries for all participating LMICs [1]. Hence, in 2022 the organization faced new challenges like vaccine-wastage and difficulties in vaccine donations [2], the waning interest of governments and vaccine hesitancy among the population, as well as financial constraints [3]. This article focuses on the ethical analysis of the first year of allocation (2021) during the acute phase of the pandemic. Resulting knowledge is of great importance in the preparation of new COVID-19 outbreaks—such as the rapid spread of the virus in China in December 2022—and potential new aggressive virus mutations, as well as to be able to balance arisen disparities and inequities that might arise worldwide. We emphasize the importance of learning from past experiences to develop a strengthened allocation framework capable to ensure fair, fast and global distribution of a scarce resource in future health emergencies. Therefore, we present our—both ethical and practicable—allocation framework named 'Prioritized Distribution of Equal Shares' for future pandemics.

2. The COVAX Facility and Its First Year of Vaccine Distribution

The COVAX Facility ('COVID-19 Vaccines Global Access') was founded by the WHO in April 2020 in collaboration with the 'Coalition for Epidemic Preparedness Innovations' (CEPI) and the 'Global Alliance for Vaccines and Immunisation' (Gavi) in response to the ongoing COVID-19 pandemic. As part of the 'Access to COVID-19 Tools Accelerator' (ACT-A), the main objective was accelerating the research, developing and producing a safe and effective vaccine and ensuring its fair and fast global distribution. Furthermore, the Facility aimed to provide access for all participating nations and to end the acute phase of the pandemic by December 2021 by delivering two billion doses to vaccinate 20% of each collaborating nation's population [4]. A total of 192 nations—92 low- and middle-income countries (LMICs) and 100 high-income countries (HICs) had joined the international organization. The self-financing nations—mostly HICs—paid entirely or proportionately in advance to the COVAX Facility, whereas less wealthy countries had the opportunity of making use of a contributed financing model or even fully funded deliveries [5]. In either case, the country firstly had to fulfill COVAX's criteria of 'country readiness and preparedness' to guarantee the appropriate handling of the vaccines within the country. Therefore, the country had to develop a 'COVID-19 National Deployment and Vaccination Plan' (NDVP), which had to be reviewed and approved by the COVAX Facility before receiving vaccine deliveries [5]. In the context of vaccine donations, COVAX acts also as a global aid agency, gathering remaining vaccine doses and funds from wealthy countries and private charitable foundations like the 'Bill & Melinda Gates Foundation' and redistributing them to nations in need.

The COVAX Facility established an allocation framework that divides the process of vaccine distribution into two phases. During the first phase of 'proportional allocation' each participating country receives COVID-19 vaccine doses proportionally to its population (principle of equality). The initial delivery of an equal share of doses for 3% of the population is supposed to ensure the functionality of the healthcare sector. Following deliveries—for up to 20%—are intended to cover high-risk groups. Once all countries have received their vaccine supply to ensure a coverage of 20%, the 'weighted allocation' phase is opened (principle of equity). Countries preserve an additional volume of vaccine doses of their choice, considering their individual 'vulnerability' and current 'threat', which are supposed to be measured by parameters such as the effective reproductive number and its trend or the universal health coverage (UHC) of the country [6]. In February 2021—three months after the first vaccines had been administered in wealthy countries—Ghana was the first nation to receive 600,000 doses of the COVID-19 vaccine provided by COVAX [7]. By 15 December 2021, the Facility had delivered 721.7 million doses to the 144 participating countries [8]. These deliveries accounted for 80% of all available vaccine doses in LICs in comparison to less than one percent in HICs [9]. During 2021, wealthier countries received enough vaccine doses from bilateral contracts to protect their population. So, the US and European HICs decided to voluntarily forgo their share of vaccine doses from COVAX and to donate either money or vaccine doses from bilateral contracts to support the global efforts [8]. So, during the first ten months of vaccine roll-outs, "over 90 million donated doses have been delivered to the [African] continent via COVAX and AVAT ['African Vaccine Acquisition Trust'] and millions more via bilateral arrangements" [10]. Despite these donations and deliveries, COVAX's target of ensuring global equity in vaccine access had not been reached neither in the first year of allocation nor in the course of 2022; as of 15 December 2021, 66.33% of the population in HICs had been vaccinated at least once, compared to only 9.02% in LICs [11]. However, not all HICs voluntarily refused their share of vaccines; about 4.6 million doses were dispensed by the COVAX Facility in the second quarter of 2021 to the well-developed nations of Australia, United Kingdom, Canada, South Korea and New Zealand—all of those countries having already received vaccine doses from bilateral contracts. At the same time, several LMICs still had to wait for their first delivery [12]. Instead of supporting HICs, which had already been adequately supplied, these valuable doses could—for example—have secured the protection of the elderly in

the undersupplied MIC Brazil by doubly vaccinating the entire population aged 65 and above [13]. They could also have guaranteed a stable healthcare system in the also still underserved MIC South Africa by ensuring the complete vaccination of the whole sector of healthcare workers there [14]. Moreover, most HICs did not keep their promises regarding their pledged donations, breaking the engagements and delaying the financial support and the delivery of vaccines—undermining COVAX's fundamental principles and goals. For instance, Germany promised to donate 95 million doses of the COVID-19 vaccine, of which by December 2021 only 15 million had been delivered to eligible countries [15]. In addition to some countries not respecting their goals and duties, COVAX also had to face structural problems. Supply shortages, politically motivated export bans such as in India and Europe, "delays in obtaining Emergency Use Authorization approvals" [16] and unfulfilled criteria of country readiness kept COVAX from reaching its objectives [17]. During the first year of worldwide vaccine distribution, various scenarios of inequity occurred: "more than 80% of all COVID-19 vaccines have been administered in high- and upper-middle-income countries. [. . .] Meanwhile, less than 1% of doses have been administered in low-income countries" [18]. Moreover, the interim goal of "scal[ing] up the delivery of at least 2 billion doses of vaccines in 2021 to cover initial high-risk target groups" [19] had not been accomplished by the end of 2021. In the first quarter of 2022, COVAX adjusted its second allocation phase "to be mainly driven by participant demand as supply constraints [had] ease[d]" [20].

Nevertheless, COVAX remains the main organization for global access to the scarce resource of vaccine doses, and has the potential of controlling or even eradicating the virus [21]. Since 2022, COVAX reacted to criticism and the dynamic course of the pandemic by adapting its allocation framework [20], addressing each country's "individual targets and ambitions" [22]. As the world is currently facing new COVID-19-related challenges—such as the waning interest of governments, vaccine hesitancy of the population [3], financial bottlenecks or wastage of vaccines and difficulties in vaccine donations [2]—as well as other international crises and ongoing wars, continuous re-evaluation and improvement remains necessary. Additionally, an ethical interim analysis of the first year of allocation, 2021, is essential to establish an optimized allocation framework for fair, fast and global distribution of scarce resources for future health emergencies and to learn from past mistakes.

3. Ethical Analysis of the COVAX Allocation Principles and Their Implementation in 2021

The 'values framework for the allocation and prioritization of COVID-19 vaccination' by the WHO 'Strategic Advisory Group of Experts on Immunization' (SAGE) lists six framework principles and goals to be considered by the COVAX Facility: 'Human Well-Being', 'Equal Respect', 'Global Equity', 'National Equity', 'Reciprocity' and 'Legitimacy' [23]. Since their first announcement in September 2020, ethicists have controversially discussed particularly three of these prioritization principles: human well-being, equal respect and global equity. The following paragraph defines all principles but focuses on an ethical analysis regarding the implementation of the three tenets mentioned above as part of the proportional allocation framework applied in 2021 [23].

Both principles 'National Equity' (striving for "equity in vaccine access and benefit within countries") and 'Reciprocity' ("honoring obligations of reciprocity to those individuals and groups within countries", prioritizing for example frontline workers) affect allocation frameworks within countries [23]. As we focus on a global allocation framework, these two principles will not be further discussed.

'Legitimacy' aims at making global and "national decisions about vaccine prioritization through transparent processes that are based on shared values, best available scientific evidence and appropriate representation and input by affected parties" [23]. We consider this tenet essential at any time in the development and realization of any allocation framework. However, as 'Legitimacy' does not directly interfere with a framework's content, we

will not analyze this principle either. 'Human Well-Being' expresses the will to "protect and promote human well-being including health, social and economic security, human rights and civil liberties, and child development." Applied to the ongoing pandemic, the aim is to "[r]educe death and disease-burden from the COVID-19 pandemic", to contain transmission, to prevent the increase in socio-economic disparities and to "protect the continuing functioning of essential services" [23]. One approach to protecting human well-being and reducing mortality might be allocating vaccines according to the principle of 'saving the most lives' [24]. Therefore, Emanuel et al. distinguish between direct and indirect harm caused by the pandemic [25]. COVID-19 morbidity and mortality are described as direct consequences. These threaten LMICs in particular, as their residents are at higher risk of severe disease and death due to lower healthcare system possibilities and treatment options. At the same time, there is a high risk of transmission due to non-existent COVID-19 safety measures [24]. Obviously, the global pandemic impacts the quality of life of citizens in every country. Nevertheless, indirect harm, such as health system overstress—causing disproportionately more deaths in LMICs, mental health disorders, social and economic crises, such as poverty, unemployment and lack of education, particularly threatens the lives of residents in LMICs due to deficient infrastructure and lack of governmental support [26]. In addition, LMICs are at a higher risk of fundamental destabilization accompanied by a long and difficult recovery [11]. Sharma et al. demonstrate the idea of 'saving the most lives' through formal epidemiological modeling; most deaths are prevented when vaccines are distributed according to the high local burden of COVID-19 [27]. For instance, "an individual living in Brazil, Bolivia or Peru is at least 10 times more likely to die from COVID-19 than an individual living in Australia, New Zealand or South Korea" [27]. The authors estimated that "after the first round of vaccine distribution, at least 200 more deaths a day would be averted in Brazil compared with New Zealand" [27]. This assumption proved true; after the vaccination campaign for the high-risk group of the elderly in Brazil, a significant reduction in the COVID-19 mortality—especially among older people—was observed. Consequently, "over 40 thousand deaths" [13] could have been averted by an earlier delivery of vaccine doses to Brazil by the COVAX Facility. These examples prove the necessity of considering both indirect and direct harm during vaccine allocation in order to save the most lives. Unfortunately, the resulting higher number of premature deaths caused in 2021—particularly in LMICs—is irreversible and "cannot be compensated later on" [25]. The COVAX strategy of merely allocating vaccine doses proportionally during the year 2021 neither saved the most lives nor did it "protect and promote human well-being" [23]. The possible reasons why COVAX nonetheless chose to allocate proportionally will be discussed below.

This leads to another value stressed by the SAGE framework: ensuring "equity in vaccine access and benefit globally among people living in all countries, particularly those living in low-and middle-income countries" [23]. Therefore, the WHO wants to consider "special epidemic risks and need of all countries" and to "ensure that all countries commit to meeting the needs of [. . .] countries that cannot secure vaccine for their populations on their own" [23]. Yet, until the end of 2021, vaccines were distributed only in terms of population size without any individual case assessment. Herzog et al. stress the limits of proportional allocation; without considering epidemic risks, vulnerability and the individual impacts of the pandemic for each country, differences in need cannot be addressed adequately [28]. A country's needs should be taken into account right from the beginning of the distributional process (weighted allocation) [27]. By treating countries equally without considering individual needs, global equity was not achieved during the first year of allocation. To promote equity in a worldwide pandemic, Emanuel et al. emphasize the necessity of global collaboration: "national governments have cross-border responsibilities to help satisfy fundamental needs like basic health care" [25]. Hence, equity-threatening but also predictable vaccine nationalism has to be countered by 'moral cosmopolitanism' [24]. Therefore, legally binding duties need to be established, which oblige HICs to financially support global health goods or vaccine manufactures to donate

a share of their batch to COVAX [29]. To respond to a global pandemic, "much greater cooperation from industry, [. . .] from states and international organizations in supporting mandatory solutions [. . .] is urgently needed" [30]. Generally, "A global pandemic requires a world effort to end it—none of us will be safe until everyone is safe" [31]. Given the uncontrolled global transmission, the emergence of new aggressive virus mutations and enormous pandemic-related economic burdens, promoting worldwide vaccination coverage could even be justified on the basis of the self-interest of HICs: "even from a non-egalitarian and consequentialist perspective, a more equal distribution of vaccines may be better if it brings us closer to a situation without large unvaccinated populations" [32]. Currently, the disparities in vaccination coverage between HICs (73%) and LICs (31.5%) show that international collaboration and support has been clearly insufficient (as of February 2023) [11].

Following this thought, one has to discuss the last SAGE framework principle: the desire for 'equal respect'. Reaching this target requires to "recognize and treat all human beings as having equal moral status and their interests as deserving of equal moral consideration" [23]. Herzog et al. criticize COVAX's proportional distribution as being an inappropriate approach to ensure 'equal respect': "[t]reating people identically regardless of their circumstances [and different needs] is not equal respect" [28]. One aspect of 'equal moral consideration' is based on differences in vaccine affordability, "[HICs] have to increase their health care spending by 0.8% on average to cover cost of vaccinating 70% of the population [, whereas LICs] have to increase their health care spending by 56.6%" [11]. Without financial support, LICs are unable to afford enough vaccines on their own. Jecker et al. propose to put 'equal moral consideration' into practice by following the main principles of justice; applied to the global COVID-19 pandemic, these tenets all "converge on the idea that people in wealthy nations have significant duties to people in poorer nations" [24]. The sufficitarian justice principle describes the idea that people everywhere are entitled to a minimally decent life, including access to essential health goods such as a vaccine in pandemic situations. The prioritarian justice principle aims at improving the situation of those who are worse off and is, therefore, associated with the idea of 'narrow social utility', which emphasizes the prioritization of those who guarantee the functioning of the society within a country [24]. Vaccinating frontline healthcare workers in a country with a high occurrence of infection and insufficient safety measures may ensure the short-term functioning of the healthcare system, and therefore, stabilize society. The tenet can also be interpreted as a criterion to favor entire countries in uncontrolled pandemic situations. Applied to the situation of the COVID-19 pandemic in 2021, many MICs—for example Brazil, India and South Africa—presented the above-mentioned high-risk constellation and could have profited from following the idea of narrow social utility. The prioritization of entire nations in challenging situations is also justifiable due to the preexisting disparities between countries, based on the idea of luck egalitarian justice, the general duty to correct unchosen disadvantages [33]. Global injustice—especially between highly and least developed nations—has been reinforced during the pandemic, illustrated by the increase in the poverty headcount ratio [27]. Applying the principle of equal moral consideration can be accounted as an indispensable condition to reach global equity. Consequently, the principles of global equity and equal moral consideration can be seen as interdependent—and neither have been achieved so far.

The three SAGE framework principles analyzed above all demand the prioritization of LMICs, for whom preventative measures, such as vaccines, might even be the most efficient tool to fight the pandemic [34]. This underlines once again the unique selling proposition of the COVAX Facility—the main international organization distributing vaccine doses globally. Yet, considering different principles of prioritization is not sufficient to pursue the goals of distributional justice and equitable access to the COVID-19 vaccine. First, the practical feasibility of an allocation framework has to be ensured. Sharma et al. and the COVAX Facility doubted the practicability of a targeted allocation process (cf. 'Fair Priority Model'), excluding HICs during the first vaccine roll-outs and, therefore, risking their non-

participation. Without their financial support, COVAX's entire capacity for action would have been endangered [27]. On the one hand, applying a targeted allocation mechanism from the beginning would have saved more people (saving the most lives) and would have created less injustice (equity). On the other hand, the risk of this model not being realizable at all is significantly higher. Consequently, the non-existence of COVAX would have led to an even higher number of deaths and inequities [27]. Probably that is why COVAX decided to distribute in equal shares—equality instead of equity—during the first allocation phase. Unfortunately, thereby preexisting global disparities had been aggravated during the pandemic. By signing legally binding bilateral contracts for more than two billion doses of future vaccines, HICs were able to secure their vaccine coverage on their own, whereas LMICs remained fully dependent on the COVAX deliveries [24].

4. Alternative Allocation Frameworks

Ethics experts proposed alternative models on how to fairly distribute vaccines globally, highlighting the importance of the values discussed above. They stressed the necessity and duty of prioritizing entire nations over others, as also provided for COVAX's second allocation phase. The 'Multivalue ethical framework for fair global allocation of a COVID-19 vaccine' by Liu et al. proposes to consider 'reciprocity' in addition to COVAX's factors of 'vulnerability' and 'threat'. Unlike the COVAX Facility—using a national approach [23]—the authors implement 'reciprocity' in an international context. They call for the prioritization of entire countries that take part in research, development and production of vaccines [33].

Emanuel et al. emphasize the necessity of an allocation framework based on medical ethics: the 'Fair Priority Model' grounded on the values of "benefiting people and limiting harm, prioritizing the disadvantaged, and equal moral concern" [25]. The authors divide the process of vaccine distribution into three phases. The first allocation phase aims for the reduction in premature deaths, quantified by the 'Standard Expected Years of Life Lost' (SEYLL) per vaccine dose in each country. On the one hand, the parameter is standardized to the world's highest life expectancy, valuing life years equally in all countries, which indirectly favors LMICs due to their lower life expectancy. On the other hand, the parameter "depends on each country's demography, prevalent comorbidities, and health system capacity" [25] estimating the specific mortality risk for each country. In the following phase, the framework focuses on the socio-economic impact of the pandemic and its countermeasures. In addition to the estimated SEYLL averted, the 'gross national income' (GNI) decline prevented and the possible reduction in the poverty gap per vaccine dose are taken into consideration. The objective of the third phase is to contain the community spread of COVID-19 to return to a fully functioning society and economy. Prioritizing correspondingly to the current transmission rate, the acute pandemic situation in each country would be considered. The authors propose to distribute a limited amount of vaccine doses per country, sufficient to stabilize the rate of transmission (Rt) below one. However, the 'Fair Priority Model' seems to be in danger of being too idealistic, and therefore, not practically feasible. First, measuring the SEYLL of each country would be complicated, lengthy or even impossible due to lack of data. Second, by excluding HICs during the first roll-outs, their non-participation is highly probable, threatening the successful implementation of the 'Fair Priority Model.'

5. 'Prioritized Distribution of Equal Shares'

We propose the idea of 'Prioritized Distribution of Equal Shares'—combining the concepts of equality (proportional allocation) and equity (weighted allocation) right from the beginning while ensuring practical feasibility. Our framework aims at allocating equal shares of vaccine doses to all participating countries. The order of deliveries depends on the individual 'vulnerability' and 'threat' of each nation as defined by the COVAX Facility. We also stick to COVAX's interim targets for the roll-outs of 3% and 20% of each country's population to primarily protect front-line workers and later high-risk groups. In addition,

the basic requirement for receiving vaccine doses is that the criteria of 'country readiness and preparedness' defined by the COVAX Facility are met.

The following paragraph explains our allocation framework 'Prioritized Distribution of Equal Shares' ('PDES') in detail. The first deliveries go to countries that have been classified as vulnerable in the risk assessment. Once these highly vulnerable and threatened countries have received enough doses to vaccinate at least 3% of their population, supplies will be directed to countries with lower risk constellations. Therefore, HICs would maybe not receive doses in the very first roll-outs, but their needs will still be met during the first distribution step. Doses are only provided for countries having a general vaccination coverage below 3%. An interim distributional target ('step') will be reached as soon as every nation achieves a vaccination coverage rate of 3%—either through COVAX deliveries or bilaterally procured vaccines. Thus, wealthier nations having already received enough vaccines to protect 3% of their population out of bilateral arrangements are not included in these very early deliveries, whereas LMICs, which depend on a global distribution of vaccine doses, are indirectly prioritized.

This enables 'Prioritized Distribution of Equal Shares' to achieve equity in vaccine allocation. By applying 'Prioritized Distribution of Equal Shares,' the needs of highly vulnerable and threatened countries are addressed early and adequately. As stated above, COVAX delivered millions of vaccine doses to nations such as Australia and the United Kingdom—countries having already received vaccine doses from bilateral contracts, whereas LMICs still had to wait for their first delivery [13]. We are convinced that applying 'PDES' can contribute to an equitable global distribution by focusing on 'vulnerability' and 'threat' of each country right from the beginning of the distributional process. We avoid supplying richer countries that have already secured a sufficient amount of vaccines through bilateral agreements to vaccinate 3% of their population. Instead, 'PDES' first supplies those countries that cannot afford bilateral contracts and are, therefore, dependent on COVAX deliveries. Only when equality has been achieved and all countries have received the same shares, will further deliveries be made. That is why the implementation of the 'PDES' allocation framework can reach both ethical principles, 'equity' and 'equality'. It is hardly possible to keep wealthy countries from signing bilateral contracts with vaccine manufacturers because for HICs, bilateral contracts are a financially affordable and effective measure to protect their population. Yet, applying 'PDES' is one way to prevent HICs from unjustifiably profiting from COVAX. Allocating vaccines primarily to countries in great need and without sufficient vaccine supply appears crucial to ensure effective global vaccine distribution.

We also assume that—in contrast to the other frameworks presented above—the practicability of our allocation framework is guaranteed; HICs would participate to ensure the vaccine coverage of their populations as fast as possible. In case HICs are able to generate a sufficient vaccine coverage from bilateral contracts, the 'PDES' allocation framework can directly address LMICs. If HICs are not able to ensure sufficient vaccine coverage on their own, they will be included in the regular process of allocation and will receive the same share of vaccine doses as every other country in a weighted order, following the 'Prioritized Distribution of Equal Shares' model. We believe that by applying a weighted distribution of equal proportionate shares, the best outcome can be expected—both in terms of a fair consideration of all participating countries and in terms of global pandemic response.

6. Conclusions

This article focuses on moral considerations concerning the basic ethical principles of the COVAX allocation framework and its implementation in 2021. Scientists all over the world have submitted proposals for changing the mechanism of the COVID-19 vaccine distribution to address growing global inequities and disparities. To maintain trust and confidence, COVAX must respond with official statements to arising criticism; transparent confrontation with alternative allocation frameworks for example the 'Fair Priority Model' developed by Emanuel et al., as well as a continuous adaptation regarding new evidence and the current development of the acute pandemic are demanded [27]. COVAX did

reply to criticism, most recently by publishing a comprehensive analysis of the "key COVAX learnings for future pandemic preparedness and response" [5]. However, all these adaptions have only started happening since the first quarter of 2022—one year and a half after the publication of the 'Fair Priority Model' and 9 months after COVAX's interim analysis in July 2021. Besides the reaction to criticism, there are severe procedural and structural problems regarding the COVAX Facility as well as the ACT-A, which lead to a lack of capacity for action of these international institutions [34]. Additionally, COVAX depends on the financial support of its participating countries, particularly HICs [35]. The imbalance of power between global and national structures, as well as patent protection in a profit-oriented economy reduce COVAX's potential of acting. As of now, COVAX does not have to deal with supply bottlenecks anymore; the organization has to face further problems that have arisen: vaccine hesitancy and waste of vaccines in HICs [36], LMICs lacking an adequate structure for vaccine donations and distribution, financial difficulties because of delayed or even cancelled donations of HICs [3], as well as the waning interest of the countries due to current international crises and wars. Probable solutions can be transparent fund-raising campaigns bringing global equity in vaccine allocation once again in the center of public attention. In addition, COVAX could also strive to simplify the procedure of donation and attempt to operate as a platform for "effective vaccine safety communication," fighting upcoming vaccine hesitancy and the lack of trust between the public and the scientific community [34]. The participation of all those affected in the discourse, especially high-risk groups, must be guaranteed [37].

The Secretary-General of the United Nations António Guterres judged the course of the COVID-19 pandemic: "[w]e passed the science test. But we are getting an F in Ethics" [38]. Following this thought, the global community has to focus on ethical discourse to arouse public awareness and solidarity and to protect "not only the health of many citizens but also the fundamental tenets of democratic institutions" [39]. High quality in ethical discourse requires the participation of ethicists and moral philosophers in decision-making committees. Ruth Faden being the only expert of medical ethics in the 'SAGE Working Group on COVID-19 vaccines' demonstrates an underrepresentation and justifies our claim for more ethical participation [40].

Developing a fair allocation framework for fast and global distribution of scarce resources during an ongoing pandemic "while keeping the world's leader engaged [and] maintaining a vision and strategy that would hold both healthy and poor country [. . .] in between" [29] is an almost infeasible challenge—a "challenge that requires responses from various actors and may require new approaches to collaboration between different governments and non-governmental actors" [41]. During an ongoing pandemic, one of the main difficulties is finding the answer to the question of how "to build the car while you are driving it" [29]. Learning from former experience will help to strengthen an allocation framework capable of ensuring fair, fast and global distribution of a scarce resource in preparation of new COVID-19 outbreaks and future health emergencies. Therefore, we present our—both ethical and practicable—allocation framework named 'Prioritized Distribution of Equal Shares'.

Author Contributions: Conceptualization, L.C.H., S.F. and A.F.; methodology, L.C.H., S.F. and A.F.; formal analysis, L.C.H. and S.F.; investigation, L.C.H. and S.F.; resources, L.C.H., S.F. and A.F.; writing—original draft preparation, L.C.H. and S.F.; writing—review and editing, L.C.H., S.F. and A.F.; supervision, A.F.; project administration, A.F.; funding acquisition, A.F., L.C.H. and S.F. are the main contributors and share the authorship equally under supervision of A.F. All authors participated in the editing of the manuscript. All authors have read and agreed to the published version of the manuscript.

Funding: The present work was performed in partial fulfilment of the requirements for obtaining the degree "Dr. med." by both authors under supervision of Andreas Frewer. The dissertation project is funded by the 'Josef und Luise Kraft-Stiftung' in the context of the Graduate School 'Human Rights and Ethics in Medicine for the Elderly' at the Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU). We acknowledge financial support by Deutsche Forschungsgemeinschaft and

Friedrich-Alexander-Universität Erlangen-Nürnberg within the funding program "Open Access Publication Funding".

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. European Investment Bank. President Hoyer Pledges €1 Billion New Support for COVAX. 2022. Available online: https://www.eib.org/de/press/news/president-hoyer-pledges-eur1-billion-new-support-for-covax (accessed on 9 January 2023).
2. Rackimuthu, S.; Narain, K.; Lal, A.; Nawaz, F.A.; Mohanan, P.; Essar, M.Y.; Ashwoth, H.C. Redressing COVID-19 vaccine inequity amidst booster doses: Charting a bold path for global health solidarity, together. *Glob. Health* **2022**, *18*, 23. [CrossRef] [PubMed]
3. The New York Times. The Drive to Vaccinate the World against COVID Is Losing Steam. 2022. Available online: https://www.nytimes.com/2022/04/23/health/covid-vaccines-world-africa.html (accessed on 9 January 2023).
4. World Health Organization. WHO Concept for Fair Access and Equitable Allocation of COVID-19 Health Products. 2020. Available online: https://www.who.int/publications/m/item/fair-allocation-mechanism-for-covid-19-vaccines-through-the-covax-facility (accessed on 7 January 2023).
5. World Health Organization. COVAX: Key Learnings for Future Pandemic Preparedness and Response. 2022. Available online: https://www.who.int/publications/m/item/covax--key-learnings-for-future-pandemic-preparedness-and-response (accessed on 28 February 2023).
6. World Health Organization. Allocation Mechanism for COVAX Facility Vaccines. 2020. Available online: https://www.who.int/publications/m/item/allocation-mechanism-for-covax-facility-vaccines-explainer (accessed on 9 January 2023).
7. Gavi, the Vaccine Alliance. COVAX Vaccine Roll-Out GHANA. The First Batch of Covax Vaccines Has Arrived in Ghana This Morning. 2021. Available online: https://www.gavi.org/covax-vaccine-roll-out/ghana (accessed on 9 January 2023).
8. UNICEF. COVID-19 Vaccine Market Dashboard. An Interactive Tool for Partners, Manufacturers, and Countries to Follow the Developments of the COVID-19 Vaccine Market with Up-to-Date Information. 2022. Available online: https://www.unicef.org/supply/covid-19-vaccine-market-dashboard (accessed on 12 January 2023).
9. World Health Organization. ACT-Accelerator Strategic Plan & Budget: October 2021 to September 2022. 2021. Available online: https://www.who.int/publications/m/item/act-accelerator-strategic-plan-budget-october-2021-toseptember-2022 (accessed on 9 January 2023).
10. World Health Organization. Joint Statement on Dose Donations of COVID-19 Vaccines to African Countries. 2021. Available online: https://www.who.int/news/item/29-11-2021-joint-statement-on-dose-donations-of-covid-19-vaccines-to-african-countries (accessed on 9 January 2023).
11. United Nations. Data Futures Platform. Global Dashboard for Vaccine Equity. 2021. Available online: https://data.undp.org/vaccine-equity/ (accessed on 28 February 2023).
12. World Health Organization. ACT Accelerator Quarterly Update Q2: 1 April–30 June 2021. 2021. Available online: https://www.who.int/publications/m/item/act-accelerator-quarterly-update-q2-1-april---30-june-2021 (accessed on 20 May 2022).
13. Victora, C.G.; Castro, M.C.; Gurzenda, S.; Medeiros, A.C.; Giovanny, F.V.A.; Barros, A.J.D. Estimating the early impact of vaccination against COVID-19 on deaths among elderly people in Brazil: Analyses of routinely-collected data on vaccine coverage and mortality. *EClinicalMedicine* **2021**, *38*, 101036. [CrossRef] [PubMed]
14. Government of South Africa. COVID-19 Coronavirus Vaccine. 2021. Available online: https://www.gov.za/covid-19/vaccine/vaccine (accessed on 9 January 2023).
15. Fricke, A. Criticism: Booster Doses in Germany at the Expense of Vaccinations in Africa. Ärztezeitung. 2021. Available online: https://www.aerztezeitung.de/Politik/Kritik-Boostern-in-Deutschland-geht-zulasten-Impfungen-in-Afrika-424971.html (accessed on 9 January 2023).
16. Afolabi, M.O.; Wariri, O.; Saidu, Y.; Otu, A.; Omoleke, S.A.; Ebenso, B.; Adebiyi, A.; Ooko, M.; Ahinkorah, B.O.; Ameyaw, E.K.; et al. Tracking the uptake and trajectory of COVID-19 vaccination coverage in 15 West African countries: An interim analysis. *BMJ Glob. Health* **2021**, *6*, e007518. [CrossRef] [PubMed]
17. Choi, E.M. COVID-19 vaccines for low- and middle-income countries. *Trans. R Soc. Trop. Med. Hyg.* **2021**, *115*, 447–456. [CrossRef] [PubMed]
18. Bill & Melinda Gates Foundation. Innovation & Inequity. 2021. Available online: https://www.gatesfoundation.org/goalkeepers/report/2021-report (accessed on 9 January 2023).
19. World Health Organization. What Is the Access to COVID-19 Tools (ACT) Accelerator, How Is It Structured and How Does It Work? *2021.* Available online: https://www.who.int/publications/m/item/what-is-the-access-to-covid-19-tools-(act)-accelerator-how-is-it-structured-and-how-does-it-work (accessed on 7 January 2023).
20. World Health Organization. Phase 2 of the COVAX Allocation Mechanism: Demand Driven Allocation for AMC-91 Participants with a Focus on Supporting Lower Coverage Participants. 2022. Available online: https://www.who.int/publications/m/item/explainer-for-covax-allocation-phase-2 (accessed on 9 January 2023).

21. Wilson, N.; Mansoor, O.D.; Boyd, M.J.; Kvalsvig, A.; Baker, M.G. We should not dismiss the possibility of eradicating COVID-19: Comparisons with smallpox and polio. *BMJ Glob. Health* **2021**, *6*, e006810. [CrossRef] [PubMed]
22. World Health Organization. Annex 3: Phase 2 of the Allocation Mechanism: Demand-Driven Allocation for AMC-91 Participants with a Focus on Supporting Lower Coverage Participants. 2022. Available online: https://www.who.int/publications/m/item/annex-for-phase-2-of-covax-allocation-framework (accessed on 7 January 2023).
23. World Health Organization. WHO SAGE Values Framework for the Allocation and Prioritization of COVID-19 Vaccination. 2020. Available online: https://www.who.int/publications/i/item/who-sage-values-framework-for-the-allocation-and-prioritization-of-covid-19-vaccination (accessed on 10 January 2023).
24. Jecker, N.S.; Wightman, A.G.; Diekema, D.S. Vaccine ethics: An ethical framework for global distribution of COVID-19 vaccines. *J. Med. Ethics* **2021**, *47*, 308–317. [CrossRef] [PubMed]
25. Emanuel, E.J.; Persad, G.; Kern, A.; Buchanan, A.; Fabre, C.; Halliday, D.; Heath, J.; Herzog, L.; Leland, R.J.; Lemango, E.T.; et al. An ethical Framework for global Vaccine Allocation. *Science* **2020**, *369*, 1309–1312. [CrossRef] [PubMed]
26. Herlitz, A.; Lederman, Z.; Miller, J.; Fleurbaey, M.; Venkatapuram, S.; Atuire, C.; Eckenwiler, L.; Hassoun, N. Just allocation of COVID-19 vaccines. *BMJ Glob. Health* **2021**, *6*, e004812. [CrossRef] [PubMed]
27. Sharma, S.; Kawa, N.; Gomber, A. WHO's allocation framework for COVAX: Is it fair? *J. Med. Ethics* **2021**, *48*, 434–438. [CrossRef] [PubMed]
28. Herzog, L.M.; Norheim, O.F.; Emanuel, E.J.; McCoy, M.S. Covax must go beyond proportional allocation of COVID vaccines to ensure fair and equitable access. *BMJ* **2021**, *372*, m4853. [CrossRef] [PubMed]
29. Taylor, A. What Have We Learned in One Year of COVAX? Launch & Scale Speedometer. Duke Global Health Innovation Center. 2021. Available online: https://launchandscalefaster.org/blog/what-have-we-learned-one-year-covax (accessed on 9 January 2023).
30. Geiger, S.; McMahon, A. Analysis of the institutional landscape and proliferation of proposals for global vaccine equity for COVID-19: Too many cooks or too many recipes? *J. Med. Ethics* **2021**, 1–8. [CrossRef] [PubMed]
31. World Health Organization. A Global Pandemic Requires a World Effort to End It—None of Us Will Be Safe until Everyone Is Safe. Access to Vaccines, Tests and Treatments for Everyone Who Needs Them Is the Only Way Out—This Is a Historic Test for Global Cooperation. 2020. Available online: https://www.who.int/news-room/commentaries/detail/a-global-pandemic-requires-a-world-effort-to-end-it-none-of-us-will-be-safe-until-everyone-is-safe (accessed on 9 January 2023).
32. Albertsen, A. A vaccine tax: Ensuring a more equitable global vaccine distribution. *J. Med. Ethics* **2021**, *48*, 658–661. [CrossRef] [PubMed]
33. Liu, Y.; Salwi, S.; Drolet, B.C. Multivalue ethical framework for fair global allocation of COVID-19 vaccine. *J. Med. Ethics* **2020**, *46*, 499–501. [CrossRef] [PubMed]
34. Moon, S.; Armstrong, J.; Hutler, B.; Upshur, R.; Katz, R.; Atuire, C.; Bhan, A.; Emanuel, E.; Faden, R.; Ghimire, P.; et al. Governing the Access to COVID-19 Tools Accelerator: Towards greater participation, transparency, and accountability. *Lancet* **2022**, *399*, 487–494. [CrossRef] [PubMed]
35. Hortal-Carmona, J.; Díaz-Cobacho, G. Global Distribution of COVID-19 Vaccine: Mine First. *Philosophies* **2022**, *7*, 106. [CrossRef]
36. Leach, M.; MacGregor, H.; Akello, G.; Babawo, L.; Baluku, M.; Desclaux, A.; Grant, C.; Kamara, F.; Nyakoi, M.; Parker, M.; et al. Vaccine anxieties, vaccine preparedness: Perspectives from Africa in a COVID-19 era. *Soc. Sci. Med.* **2022**, *298*, 114826. [CrossRef] [PubMed]
37. Forster, S.; Frewer, A. COVID-19-Pandemie und der Schutz Älterer im internationalen Vergleich. Ergebnisse komparativer Forschung ausethischer Perspektive. In *Pandemien und Ethik*; Reis, A., Schmidhuber, M., Frewer, A., Eds.; Springer: Berlin/Heidelberg, Germany, 2021; pp. 259–290.
38. United Nations. COVID-19: UN Secretary-General Says the World Has Failed an Ethics Test. 2021. Available online: https://unric.org/en/covid-19-un-secretary-general-says-the-world-has-failed-an-ethics-test (accessed on 10 January 2023).
39. Semplici, S. Ethics in Emergency Times: The Case of COVID-19. *Philosophies* **2022**, *7*, 70. [CrossRef]
40. World Health Organization. Strategic Advisory Group of Experts on Immunization (SAGE). SAGE Working Group on COVID-19 vaccines (established June 2020). 2020. Available online: https://www.who.int/groups/strategic-advisory-group-of-experts-on-immunization/working-groups/covid-19 (accessed on 9 January 2023).
41. Da Silva, M. COVID-19 and Health-Related Authority Allocation Puzzles. *Camb. Q. Healthc. Ethics* **2021**, *30*, 25–36. [CrossRef] [PubMed]