



RAPID ETHICS REVIEW

VACCINE BOOSTERS, VACCINE NATIONALISM AND COSMOPOLITANISM

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OVERVIEW

- As countries around the world began vaccine booster programmes in summer 2021, the World Health Organisation called for a moratorium on booster programmes to prioritise first vaccine doses for low-income countries.
- Data from summer 2021 suggested empirical uncertainty about the comparative benefits (a) initiating booster programmes in developed countries and (b) seeking to reduce the risk of potential vaccine-resistant variants by donating vaccine doses to countries with low vaccination rates.
- Vaccine cosmopolitanism is a view of distributive justice for vaccines, according to which community membership—in particular, citizenship or belonging to a nation lacks strong moral force. It speaks in favour of allocating vaccines according to impartial principles, whereby every citizen of the world counts equally.
- Vaccine nationalism may broadly be defined as the view that countries are ethically justified in prioritising their citizens over those in other countries when it comes to the supply and rollout of vaccines. It is grounded on the claim that we can have justified reasons of partiality to prioritise the interests of our co-nationals.
- It may be possible to strike a balance between nationalist and cosmopolitan commitments by setting limits to the scope of reasonable partiality to co-nationals. One example of this strategy is Schaefer et al.'s influenza standard - On this approach, vaccine nationalism is permitted only insofar as it is necessary to ensure that covid-19 ceases to be an emergency in that country beyond background health risks such as influenza.
- Alternatively, the impasse between vaccine nationalism and vaccine cosmopolitanism might be resolved by more practical solutions that aim to (i) increase vaccine supply (e.g. by developing a more socially optimal funding structure for vaccine manufacturers) or by (ii) refining global centralised vaccine allocation mechanisms (e.g. COVAX)

INTRODUCTION

The covid-19 pandemic has raised pressing questions about the ethical principles underlying the UK's provision of international aid, particularly with respect to the extent of its obligation to donate vaccines to lower income countries. Issues concerning the UK's provision of overseas aid are by no means limited to the donation of covid vaccines. Indeed, a number of concerns have recently been raised about the UK

temporarily reducing its 0.7% GDP development aid target,¹ and the Independent Commission for Aid Impact published a report in 2021 criticising the government's progress on aid development and the lack of transparency in relevant government departments.² However, in this rapid ethics review, we focus on ethical questions about the donation of covid vaccines. This issue became particularly salient

towards the end of 2021, as developed countries around the world debated whether to initiate booster vaccination programmes.

In September 2021, following a recommendation from the Joint Committee on Vaccination and Immunization (JCVI), the UK government announced that covid-19 booster vaccinations would be offered to those over the age of 50, younger adults with health conditions and frontline health and care workers.³ Many other high and middle income countries also initiated booster programmes in this period:⁴ Israel began a booster programme in the summer of 2021, and data about the effect of that programme appears promising.⁵ The US and France approved booster doses of the Pfizer vaccine for over 65s,^{6,7} and Germany offered booster jabs for those who had their second dose of Astra Zeneca or Johnson & Johnson over 6 months ago.⁸ Indeed, Israel has announced that those who don't get a booster jab will lose their vaccine passport.⁹ At the time of writing in February 2022, booster programmes have been widely extended. At present in the UK, boosters are offered to all those over the age of 18 as those over 16 at higher

risk,¹⁰ and there are plans to offer fourth doses to particularly vulnerable individuals in Spring 2022.¹¹

However, booster programmes are somewhat controversial. In August 2021, the World Health Organization called for a moratorium on booster programmes to prioritise first vaccine doses for low-income countries.¹² The question of whether it would be ethical for the UK government to initiate a booster programme before vulnerable individuals in other countries have received a single vaccine dose depends in part on certain empirical issues, as we detail below. Ultimately though, whether a government should prioritise vaccine doses for its own citizens (a position that some have termed 'vaccine nationalism'^{13,14}) or prioritise those elsewhere with greater need (a position that some have termed 'vaccine cosmopolitanism'¹³), is an ethical question. In this review, we will briefly define and review the philosophical bases for vaccine nationalism and cosmopolitanism. First though, we shall identify and address some empirical issues that underlie the debate between vaccine nationalism and cosmopolitanism in the debate about booster doses.

I EMPIRICAL ISSUES

At the time at which booster programmes were initiated in the second half of 2021, the practical significance of the debate between vaccine nationalism and vaccine cosmopolitanism relied on the following three assumptions: (i) it is not possible to proceed with booster programmes and ensuring adequate vaccine supplies in less developed nations at the same time; (ii) booster programmes are necessary to counter the waning of vaccine-induced immunity over time and (iii) that the nationalist interests of developed nations are best served by proceeding with booster programmes rather than donating vaccines to reduce viral transmission (and its attendant risk of virus mutation) elsewhere. We briefly consider each in turn.

(i) **Booster programmes vs Delivering vaccines to low-income countries: a false choice?**

There is considerable inequity in global covid-19 vaccine distribution. According to figures from the Financial Times vaccine tracker at the time that the UK vaccine booster programme was initiated,¹⁵ of the 6.06 billion doses that had been delivered by September 2021, over 4.3 billion of these doses had been delivered in just 10 countries (China, India, US, Brazil, Germany, UK, Japan, France, Turkey, and Italy).¹⁶

Some commentators have suggested that the WHO's call for a booster moratorium in August 2021 represented "a false choice", on the basis that it is possible to provide sufficient vaccine doses to lower income countries, or to increase their ability to produce their own vaccines, whilst proceeding with booster programmes elsewhere.¹⁷ Of course, a lack of vaccine supply was likely not the only factor contributing to low vaccination rates in lower income countries at this time. There are significant logistical challenges to overcome in distributing vaccines to different countries, and there may be considerable vaccine hesitancy amongst some communities in different countries. Indeed, media reports suggest that these issues have led to huge numbers of expired unused vaccine doses having to be destroyed in countries such as Malawi¹⁸ and Nigeria.¹⁹

However, figures from the International Monetary Fund in September 2021 suggest that vaccine supply was still a significant contributing factor to low vaccination rates in developing countries at this point. Whilst some developed countries (including the UK and the US amongst others) had either secured vaccines or an expected vaccine supply of over 200% of their total population at that point, many other countries had not yet secured enough doses for 50% of their population.²⁰ Schaefer et al. suggest that this inequity may play some role in the significant disparities in total

deaths from covid-19 that can be observed across different countries.¹⁶ However, logistical challenges in distribution and vaccine hesitancy may also play at least some explanatory role in this disparity, as well as the discrepancy in vaccine supplies *per se*; countries may be reluctant to secure vaccines that they cannot deliver.

(ii) Waning Immunity

The justification for initiating a vaccine booster programme is that immunity from initial vaccination doses can wane over time. At the time that booster programmes were initially being considered, data suggested that protection afforded by the covid-19 vaccines did wane over time, with studies finding declining antibodies amongst vaccinated individuals, and an increasing risk of breakthrough infections.²¹ These findings were also corroborated by national health care records,²² as well as an observational study of over 1 million participants over the age of 60 who had received two doses of the Pfizer vaccine in Israel. This latter study found that rates of confirmed covid-19 and severe illness were substantially lower among those who received a booster dose.⁵

(iii) Mutation

Even if booster programmes were to effectively counter waning immunity in developed nations, it is also in the interests of these nations to ensure enhanced global access to initial vaccine doses. The reason for this is that ongoing transmission of the virus in countries with low vaccination rates increases the opportunities for the SARS-CoV2 virus to mutate into a more contagious, virulent or vaccine-resistant

variant.^{16,23} However, whilst this possibility must be acknowledged, the exact extent of this risk was unclear, and prior to the emergence of Omicron at the end of 2021, there was data to suggest that current vaccines would be able to cope with foreseeable variants.²⁴⁻²⁶ Of course, we have since learnt that the Omicron variant that emerged at the end of 2021 is capable of some degree of vaccine escape;^{27,28} however, although evidence is still emerging, the available data also suggest that Omicron is associated with less severe disease.²⁹ Crucially, we cannot be sure that the same will be true of future variants that may emerge, and which might also be capable of vaccine escape.³⁰

In sum, there is some empirical uncertainty about the comparative benefits for those in developed nations alone of (a) initiating booster programmes in these countries and (b) seeking to reduce the risk of potential vaccine-resistant variants by donating vaccine doses to countries with low vaccination rates. However, there is no such uncertainty about the comparative benefit of these two alternatives at the *global level*. There is strong evidence to suggest that initial vaccine doses would be highly effective in preventing covid-19 mortality and morbidity for the large number of vulnerable people across the world who have not yet received a single dose.³¹ It is therefore likely that ensuring that these highly vulnerable individuals receive initial vaccine doses would lead to a greater overall reduction in global morbidity/mortality than topping up the waning immunity of individuals in developed nations who have already received two vaccine doses and retain at least some immunity. This final consideration is championed by those who endorse vaccine cosmopolitanism, a view that we shall now consider in greater detail.

II VACCINE COSMOPOLITANISM AND ITS THEORETICAL GROUNDS

Ferguson and Caplan define vaccine cosmopolitanism as "...a view of distributive justice for vaccines, according to which community membership—in particular, citizenship or belonging to a nation—is ethically irrelevant".¹³ It should be noted that this is a somewhat extreme conception of cosmopolitanism. More moderate forms of cosmopolitanism need not endorse the strong claim that community membership is ethically irrelevant; they can instead make the weaker comparative claim that although community membership has some ethical relevance, there are other moral reasons that can impose much stronger demands on us.³²

Cosmopolitan views can come in varying degrees of strength,³² and they may be grounded in a range of philosophical approaches. In a closely related vein, Lowry and Schuklenk outline two models of Global Health Ethics that provide a helpful framework for understanding cosmopolitanism in this sphere. First, humanitarian cosmopolitans claim that all humans share an equal entitlement to secure the resources needed to exercise or enjoy certain rights.³³⁻³⁶ On this conception, "global health obligations are owed by individuals *qua* moral beings to individuals *qua* human beings".³⁷

In contrast to the humanitarian view, the political model claims that global health obligations are

owed "...by individuals *qua* members of some state to individuals *qua* members of another state that has been adversely affected by the actions of the first state".³⁷ More specifically, the political model is premised on the claim that the causes of poor conditions for health in developing countries can be largely attributed to more developed nations or other powerful global actors. For instance, in their discussion, Lowry and Schuklenk highlight Thomas Pogge's political model, according to which the poverty of the global poor is largely caused by the unjust structure of the world economic order.³⁴ Finally, others have argued that social contract theories (which ground principles of justice and political obligation in a hypothetical social contract) can be extended to develop a permutation of the political model, involving global social contract theories of justice that share similar commitments to cosmopolitanism.^{35,36}

Across its various forms, vaccine cosmopolitanism can be construed as part of a tradition of impartialist ethics;³⁸ it suggests that impartial considerations outweigh our moral reasons of partiality to prioritise communities with whom we identify or with whom we share some other special relationship. It suggests that justice requires that every person be *treated as an equal*.³⁹ Although, some have argued that understanding morality in a wholly impartial sense fails to acknowledge the significance of our individual relationships and projects,⁴⁰⁻⁴⁴ the analytic ethical tradition is historically grounded in the assumption that there is a close connection between morality and impartiality of some form.^{45,46}

Although cosmopolitan approaches share in their commitment to equality, there are different conceptions of what it is to treat every person as an equal. One conception that is particularly relevant for the humanitarian approach is the claim that equal treatment minimally requires a recognition that all life is *equally* valuable. To illustrate, it might be argued that prioritising the life of a compatriot over the

life over a foreign national is morally impermissible because it ignores the fact that all human life is equally valuable. Tolchin uses this argument in defence of his claim that governments and citizens of high-income liberal democracies have humanitarian obligations to provide major medical aid to avert premature deaths in poor nations.³⁵ Relatedly, Peter Singer grounds his claim that affluent nations have a moral obligation to provide aid to poorer nations on his principle of equal consideration of interests: "we should give equal weight to the like interests of all those affected by our actions".⁴⁷

Both Singer and Tolchin's impartialist principles lend support to vaccine cosmopolitanism. Although the initial low supply of vaccines may mean that it is impossible to deliver sufficient vaccine doses to all countries that may need them, these principles suggest that it would be unjust for states to take more than their fair share of the scarce global supply of vaccines.^{16,48} Indeed, it has been argued that the stockpiling of vaccines in the global north entails that "...the lives of people in the global south, have been greatly discounted compared to the lives ... of those in the global north."³⁸ Emanuel et al. and Gupta and Morain have suggested that vaccines should be allocated according to impartial principles, where every citizen of the world counts equally.⁴⁹⁻⁵¹ The extent to which political forms of vaccine cosmopolitanism will speak in favour of an obligation to prioritise less developed nations in the global distribution of vaccines will depend in large part on the extent to which the health needs of less developed countries in the pandemic are attributable (either directly or indirectly) to other nations or organisations.

Despite the theoretical support for vaccine cosmopolitanism and the wide condemnation of vaccine nationalism,^{38,48,52} many countries have initiated booster programmes. We shall now consider whether there is any moral basis for vaccine nationalism.

III VACCINE NATIONALISM AND ITS THEORETICAL GROUNDS

Vaccine nationalism may broadly be defined as the view that countries are ethically justified in prioritising their citizens over those in other countries when it comes to the supply and rollout of vaccines.

Like cosmopolitan views, nationalist views can come in various degrees of strength, and can be grounded by a range of philosophical approaches.³² However, in both its moderate and more extreme forms, vaccine nationalism reflects the view that morality is not wholly impartial; instead, it implies that we can have reasons

of partiality to give priority to those with whom we share certain special relationships.

Beaton et al. have recently outlined three broad theoretical justifications of national partiality, arguing that none of these justifications are ultimately sufficient to justify vaccine nationalism.⁵³ First, instrumentalist views suggest that national partiality is ultimately justified by serving impartial and global moral goods, such as distributive justice and equality.^{53,54} However, it is not clear that instrumentalist approaches can be

successfully invoked to justify vaccine nationalism in the current context. The reason for this is that those in lower income countries are plausibly in far greater need of vaccine doses than those in higher income countries. As such, Beaton et al. suggest that nationalist policies prioritising those in higher income countries would run contrary to the impartialist goals of justice that ultimately ground reasons of national partiality on the instrumentalist approach.⁵³

Second, it might be claimed that national partiality is ultimately justified in an ‘institutional sense’, that is by the nature of citizen participation in the institution of the nation state. A central tenet of democratic theory is that citizens relinquish certain freedoms in exchange for services provided by government, including the protection of their natural rights. One of the central duties of government is thus to safeguard the public’s health, given the foundational nature of health’s role in human well-being.^{55,56} Indeed, the state may be understood to owe special and exclusive duties to its citizens on the grounds of the reciprocal duties that exist between the state and its citizens under social co-operation,^{36,57} and the power and authority of the state to coerce its own citizens.^{36,58,59} National partiality might plausibly be understood as a requirement of this reciprocity, and as necessary to legitimise state coercion.

Yet, it is not clear that these justifications of national partiality can be invoked to justify vaccine nationalism in the present context. Even if the above considerations entail that the state has duties towards its citizens, it is not clear that they can justify *absolute* priority to compatriots.⁵³ One reason for this is that some defences of national partiality presume that there are certain impartial global duties. If this is so, then global duties (to secure basic rights for example) may plausibly impose limits on the special national duties of the state to promote the interests of its citizens. To illustrate, the institutional justification of national partiality assumes certain impartial principles and duties (such as reciprocity). Beaton et al thus argue that this principle and its associated duties may plausibly constrain the scope of national partiality.⁵³ When comparable global and national duties conflict, these authors suggest that the question of whether special national duties should win out will depend on whether the states in question are unfairly advantaged in their access to right-securing goods. If this is so, then policies that leverage or exacerbate an

existing unfair advantage in the pursuit of nationalist interests are morally suspect.⁵³ On this approach, the question of whether national partiality can be justified cannot be answered in abstraction from questions about background injustice and the nature of our global duties. Of course, the plausibility of this line of argument depends on the claim that the justification of national partiality must ultimately appeal to global duties, and that these duties have their own independent justification.

Finally, advocates of partiality might maintain that partiality is justified when there is something particularly valuable about the relationship in question.^{53,60,61} Of course, not all relationships can ground reasons of partiality. For example, giving moral priority to individuals on the basis of their membership of a certain gender or race would amount to unfair discrimination rather than permissible forms of partiality.^{62,63} Accordingly, in order for a relationship to form the basis of justifiable partiality, it is typically claimed that the relationship must be especially valuable; furthermore, Miller argues that for partiality to be justified, certain duties must be integral to the nature of the relationship, and such partiality must not be inherently unjust.^{60,63,64}

In this vein, some theorists have claimed that partiality towards compatriots is justifiable because it meets the above conditions. The special value of our relationship with our compatriots has been understood to be grounded in our shared history in producing common goods with our compatriots,⁶⁵ the role of these relationships in our individual identities,⁴⁴ and the importance of these relationships to human welfare.⁴⁰ Indeed, drawing on the special obligations that community membership can ground, Ferguson and Caplan have recently argued for a form of “good vaccine nationalism”, one that “endorses the equal worth of persons and recognises obligations to persons and communities globally”, whilst recognising that priority for one’s own community may be justified.¹³

However, some have objected to the claim that co-nationality has this sort of ethical significance.^{54,66,67} Moreover, national partiality based on this justification may still be subject to moral limits, such as the need to safeguard the basic human rights,^{35,53,63,68} and to avoid exacerbating existing injustice.⁵³

IV RESOLVING THE CONFLICT BETWEEN VACCINE NATIONALISM AND COSMOPOLITANISM

As noted above, both nationalism and cosmopolitan views can come in different degrees of strength. However, amongst those who agree that there can be some reasonable forms of national partiality, it is widely accepted that such partiality must accommodate certain limits, and the idea that “there are some global duties that cannot be set aside in favour of local ones”.⁶³

However, there is considerable disagreement about how states should strike the balance between their nationalist and cosmopolitan commitments. Schaefer et al. suggest an ‘influenza standard’ as the limit of reasonable national partiality in the debate about covid-19 vaccines. On this approach, vaccine nationalism is permitted only insofar as it is necessary to ensure that covid-19 ceases to be an emergency in that country beyond background health risks such as influenza.¹⁶ If covid-19 poses a level of risk that is not deemed sufficient to warrant extensive public health measures in the case of other viruses, then Schaefer et al suggest that “there is no longer an ethical justification for retaining vaccine doses for country residents”.¹⁶ However, the influenza standard makes two assumptions that critics might potentially question: (i) that we can straightforwardly categorise deaths that are directly attributable to different viral infections and (ii) that states are currently attending appropriately to the relevant comparator viruses in their public health measures.

As noted above, an alternative limitation on reasonable forms of national partiality that many cosmopolitans champion is that nations have a duty to safeguard the basic rights of all humans. However, Miller suggests that this broad limitation can be understood to fragment into sub-duties of varying degrees of strength.⁶³ For instance, states may have very strong negative duties to refrain from infringing the basic rights of non-nationals, such that this duty excludes any partiality to compatriots that would require failing to meet this duty. However, the positive duty to secure the basic rights of non-nationals to certain goods (such as education and perhaps health) may be weaker. For instance, reasonable partiality towards compatriots here might plausibly involve “giving their rights-claims greater (though not absolute) weight when deciding how to use scarce resources”. The strength of any positive duty towards non-compatriots may also depend on whether the state in question is aptly construed as ‘the responsible agent’ for protecting those basic rights of particular non-nationals. In the absence of such responsibility, Miller suggests the duty in question is “...only a duty in the

weakest sense”, and arguably one of charity rather than justice.⁶³

As such, there can be genuine moral conflicts between partial concern for compatriots and global duties,⁵³ and Miller’s analysis highlights a number of unresolved questions that lie at the heart of the difficulty in resolving this conflict. One salient question we can generate from Miller’s discussion is ‘to what level of protection against a pandemic disease do individuals have a basic positive human right?’. If we (i) set a high threshold of protection, and (ii) immunity following two vaccine doses wanes sufficiently over time to fall below this threshold, then it might be argued that the choice between vaccine nationalism and cosmopolitanism is a choice between respecting the very same basic rights either amongst co-nationals or amongst non-nationals. In such circumstances, where we may face equally compelling moral reasons to benefit either group, nationalist policies may be more justifiable. However, if the threshold is lower or immunity following two vaccine doses does not wane sufficiently, then the choice is between safeguarding the basic rights of non-nationals or promoting the interests of nationals. In such circumstances, vaccine nationalism is less justifiable or even unjustifiable. Of course, there is also the even more basic issue of what constitutes the grounds of the basic positive human rights that Miller’s analysis appeals to, and whether these grounds are cosmopolitan in nature.

The second question Miller’s analysis raises is ‘how do we identify the responsible party whose duty it is to facilitate the basic rights of non-nationals to vaccine doses?’. Whilst supra-national organisations such as the World Health Organisation are a natural candidate for this role, they lack the power to assign responsibility to (or enforce) individual states to protect the basic rights of others. In such circumstances, it remains possible for individual states to deny that they are the ‘responsible agent’ for securing the basic rights of non-nationals, and to maintain that their duty to provide vaccines to less developed nations is one of charity rather than one of justice. One source of this lack of responsibility is that states face a collective action problem; individual states may be reluctant to abide by their commitment to contribute to the necessary collective action of donating vaccines.

Yet, even if some degree of vaccine nationalism can be justified, the exercise of such national partiality may mean that states must take on other responsibilities, if justifiable nationalism is to be reconcilable with the broader demands of impartial justice. For instance, it

might require that states hasten the end of conditions of scarcity, or tackle background injustices that have prevented low-income countries from securing

vaccine doses.⁵³ Notably though, these responsibilities may be even more demanding than simply increasing vaccine supply.

V SOME POTENTIAL PRACTICAL SOLUTIONS

What we have discussed so far suggest the following: Developed countries have an obligation to care for their citizens. However, this obligation is limited by an obligation to ensure that non-nationals in low-income countries receive protection against a deadly virus during a pandemic. Depending on one's views, this obligation may be weak or strong. To successfully fulfil the obligation to non-nationals, countries need to cooperate. Otherwise, it is difficult to establish specific responsibilities and to provide sufficient motivation to fulfil one's duties. In this section we will discuss some suggestions for how such cooperation could work. These solutions have been discussed in the content of the covid-19 pandemic, but they are also relevant for vaccine distribution in future pandemics.

Although there are several bottlenecks to a more equitable vaccine allocation, here we focus on solutions that target two specific challenges for equitable distribution; bottlenecks in supply, and mechanisms of global allocation We do not discuss the logistics of transporting vaccines globally.

(i) Vaccine Supply

If one could stimulate a substantially increased vaccine production, one could, in theory, break the trade-off between booster shots in high-income countries and distributing the first doses to low- and middle-income countries. There are primarily two types of proposals to increase supply. One is to ensure a more socially optimal funding structure for vaccine manufacturers. Both Advanced Market Commitments (AMC) and Advanced Purchase Agreements (APA) are designed to shoulder the cost of scaling up production at an early stage, to increase production.⁶⁹ APAs are contracts between individual vaccine developers and buyers, where the buyer agrees to pay for a pre-specified number of vaccines. AMCs are global commitments. A notable example is Gavi's Pneumococcal AMC, where an alliance of countries agreed to purchase vaccines at a fixed price (thus incentivizing their production) and make them available to countries that would otherwise not be able to afford them.⁷⁰ APAs have been used in the current pandemic, to great success, both by individual countries, and the European Union and COVAX, both of which we will return to below.

Christopher Snyder and colleagues (2020) have proposed an innovative mechanism in this respect.⁷¹ They propose to award APAs for breakthroughs in the late-stage development of vaccines (i.e. Phase III trials and manufacturing) that reflect the social value of the invention. This mechanism amounts to a form of so-called 'pull' funding (i.e. payment for successful products) as opposed to the traditional 'push' funding model (i.e. up-front reimbursement of research, development, and production expenditures) that has often been employed in the context of vaccine development. The pull model might potentially avoid some of the pitfalls of the push approach, such as the need to "predict 'winners' in advance (before it is known whether they can in fact produce safe and effective vaccines), elicit accurate cost information from these firms, and micromanage the development process".⁷¹ They simulate "spending an average of \$110 billion to generate net benefits of \$2.8 trillion," which they claim is "nearly double the net benefits generated by the free market."⁷¹ In another context, Thomas Pogge has proposed introducing prizes reflecting the social value of the production of vaccines. A similar idea has been proposed in the context of the covid-19 pandemic with a particular focus on so-called platform technologies that can be used to combat different diseases.^{72,73} The main challenge with these proposals, however, is that they rely on a concerted effort to fund these proposals which has proven difficult, and it is not clear what sort of timescale these solutions would involve.

The other way to reduce bottlenecks on the supply side is to spread knowledge and capacity for how to produce vaccines to low- and middle-income countries. This could be done through temporary patent waivers, as suggested by India and South Africa, or through the covid-19 Technology Access Pool (C-TAP), adopted by WHO, recommending voluntary sharing of intellectual property, knowledge, and data, as well as vaccines and drugs.⁷⁴

Another bottleneck concerns the distribution of vaccines, and we will focus on this matter in the remainder of this review. However, solutions on the distributive side will require building of institutions, mechanisms, and global agreement, which would take time. These solutions should therefore be read as possibilities, not as quick fixes.

(ii) Mechanisms of global allocation

A demanding but promising proposal to improve distribution is to work to provide a global centralised vaccine allocation, modelled on the way COVAX (Covid-19 Vaccines Global Access) has worked in the current system. It may be possible to learn from the success and failures of COVAX to build a more robust, efficient, and fair global allocation of vaccines.

COVAX is co-led by GAVI and CEPI, with support from the WHO. It works like a buyer's club for participating countries and provides a mechanism for allocating vaccines fairly among them. COVAX promised to reduce costs by bargaining as a collective, to hedge risks by betting on many manufacturers, and to allocate vaccines fairly among participating states. By using Advanced Purchase Agreements, COVAX also provided additional incentives for manufacturers to scale up vaccine production. COVAX promised to allocate vaccines equally among all countries until 20% of the population in the respective countries were vaccinated, and after that threshold was reached, to allocate vaccines in proportion to need.⁷⁵

COVAX is a promising mechanism for allocating vaccines fairly and efficiently. However, it was nevertheless not wholly successful in ensuring the equitable distribution it was set up to achieve. One potential reason for this is that high-income countries made additional bilateral agreements with manufacturers outside of COVAX, demanding priority over COVAX, and thereby undermining the efficiency and relevance of the organization.⁷⁶ COVAX thus ended up being a mechanism for low-income countries to get access to more vaccines than they otherwise would, instead of functioning as a buyer's club for rich and poor countries alike that wanted to act in their enlightened self-interest.

COVAX can be contrasted with the European Union's collective purchase of vaccines. The EU also bargained collectively with vaccine manufacturers on behalf of member states and allocated vaccines in accordance with a pre-specified agreement. However, participating member states were prohibited from engaging in bilateral deals with the same manufacturers,⁷⁷ even when doing so may have made these countries better off, at least in the short term. This may have resulted in a somewhat slower vaccination effort for at least some countries in the union, but it also stopped self-interested countries from undermining EU's role as a vaccine allocator.

What can we learn from COVAX and the EU allocation? One lesson is that one needs to enforce exclusivity to avoid undermining global coalition.

If countries are allowed to engage in bilateral agreements outside the system, it is very unlikely that the system will be able to perform its function.⁷⁴ Another lesson is that one needs to do more to ensure that developed countries can protect their own citizens. High-income countries may have engaged in bilateral agreements due to a belief that COVAX's suggested allocative mechanism promised too many vaccines to low- and middle-income countries.

Sterri and Skjelbred propose a radical novel mechanism, a global redistributive auction, that they argue could ensure developed countries' the freedom to protect their citizens while simultaneously redistributing much needed money to developing countries that can fund vaccine purchases and other necessary goods. They propose that an organization (such as COVAX) bargains with vaccine manufacturers as a monopsonist to push down prices for vaccines. Under this arrangement, the organisation would then hold an auction for the vaccines selling them to the highest bidding countries in a transparent auction. Crucially though, the profits from the auction would be distributed to the remaining participating countries, thus providing a mechanism for them to either bid for further vaccines, or to use the money to bolster their public health response in other ways. Sterri and Skjelbred argue a global redistributive auction would be both desirable and feasible; desirable since it provides the countries with what they want at given market prices while channelling an unprecedented sum of money to poorer countries. They suggest that it would also be feasible insofar it gives High-income countries freedom to protect their citizens.⁷⁸

However, there are two potential concerns with this model; first, the fairness of the model requires that financial reimbursement can constitute adequate recompense for countries who do not mount successful 'bids' for vaccines. However, it is not clear that this will be the case. For instance, in countries where citizens are willing to receive a vaccine and there is already an adequate public health infrastructure, it is not clear that even large sums of money would be able to enhance the country's pandemic response as much as the wide distribution of an effective vaccine. Second, the wide discrepancies in spending capacity across different countries may sometimes reflect historical injustices. A redistributive auction that allocates a scarce, and precious public health good on the basis of high spending capacity may simply serve to perpetuate these injustices if the value of the vaccines outweighs the financial reimbursement that non-successful bidders receive in a redistributive auction. However, this proposed redistribution model is clearly not the only one that is vulnerable to this line of criticism,

and on this model it may be possible to complement a redistributive auction with a monetary transfer reflecting the high-income countries responsibility to rectify historical injustice.⁷⁸

There may also be other mechanisms that would serve to align national and global interests in the distribution of vaccines. One solution is if countries could agree on a pricing mechanism that could ensure vaccination of both developed and developing countries. Provided the immense value to high-income countries of receiving vaccines, perhaps they could be willing to pay twice as much for each vaccine, such that for each vaccine they buy, one would be reserved for a low-income country. However, for this mechanism to generate support from high-income countries, it is likely that one would have to give them priority in the vaccine queue. Another pricing mechanism would consider the differing level of need in different countries. To ensure that the price mechanism better reflects the social cost of purchasing another vaccine, the price could increase with the share of the population who are vaccinated and the prevalence of the virus in the country, as a proxy for the harm the virus is likely to cause in these countries. The more people who are vaccinated and the lower the prevalence, the more one would have to pay to get another vaccine dose. Ideally, the money generated through this price mechanism, over and above the price paid to the vaccine manufacturers, should go to low- and middle-income countries.

These proposals do not constitute an exhaustive list of redistributive mechanisms, However, they represent some of the candidate solutions that have been discussed in the academic literature and which could, at least in theory, potentially enable a distribution that reflects more of the ethical concerns we have highlighted in this review. There are still myriad practical challenges with each proposal that we lack the space to fully explore here However, there are potentially redistributive solutions that could be explored and potentially adopted if the developed countries were willing to engage in a concerted effort to protect not only their own citizens, but also the citizens of other nations.

About this submission

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About the UK Pandemic Ethics Accelerator

The UK Ethics Accelerator is a UKRI/AHRC-funded initiative that aims to bring UK ethics research expertise to bear on the multiple, ongoing ethical challenges arising during a pandemic emergency. We provide rapid evidence, guidance, and critical analysis to decision-makers across science, medicine, government, and public health. We also facilitate public stakeholder deliberation around key ethical challenges.

Bibliography

1. UK foreign aid cut: Where does it go and what is it used for? BBC News [Internet]. 2021 May 17 [cited 2022 Feb 22]; Available from: <https://www.bbc.com/news/newsbeat-39653421>
2. Independent Commission for Aid Impact. ICAI follow-up review of 2019-20 reports [Internet]. 2021 [cited 2022 Feb 22]. Available from: <https://icai.independent.gov.uk/review/icai-follow-up-review-of-2019-20-reports/>
3. Covid booster vaccine rollout to begin across UK next week. BBC News [Internet]. 2021 Sep 14 [cited 2022 Feb 22]; Available from: <https://www.bbc.com/news/health-58550833>
4. Mahase E. Covid-19 booster vaccines: What we know and who's doing what. British Medical Journal. 2021 Aug 20;374:n2082.
5. Bar-On YM, Goldberg Y, Mandel M, Bodenheimer O, Freedman L, Kalkstein N, et al. Protection of BNT162b2 Vaccine Booster against Covid-19 in Israel. New England Journal of Medicine [Internet]. 2021 Sep 15 [cited 2021 Sep 24]; Available from: <https://www.nejm.org/doi/10.1056/NEJMoa2114255>
6. US approves Covid booster jabs for some older and at-risk Americans. BBC News [Internet]. 2021 Sep 23 [cited 2022 Mar 14]; Available from: <https://www.bbc.com/news/world-us-canada-58660338>
7. French backs COVID booster jab initiative for those 65 and older [Internet]. euronews. 2021 [cited 2022 Mar 14]. Available from: <https://www.euronews.com/2021/08/24/french-backs-covid-booster-jab-initiative-for-those-65-and-older>
8. Germany to offer Covid booster shots from September – EURACTIV.com [Internet]. [cited 2022 Mar 14]. Available from: <https://www.euractiv.com/section/health-consumers/news/germany-to-offer-covid-booster-shots-from-september/>
9. Lieber D. In Israel, Being Fully Vaccinated Now Means Three Shots. Wall Street Journal [Internet]. 2021 Aug 31 [cited 2022 Mar 14]; Available from: <https://www.wsj.com/articles/in-israel-being-fully-vaccinated-now-means-three-shots-11630426257>
10. UK Department of Health. Covid-19 vaccination: a guide to booster vaccination for individuals aged 18 years and over and those aged 16 years and over who are at risk [Internet]. GOV.UK. [cited 2022 Feb 22]. Available from: <https://www.gov.uk/government/publications/covid-19-vaccination-booster-dose-resources/covid-19-vaccination-a-guide-to-booster-vaccination-for-individuals-aged-18-years-and-over>
11. Shipman T. Fourth jab within weeks for over-75s as coronavirus restrictions dropped. The Times [Internet]. 2022 [cited 2022 Feb 22]; Available from: <https://www.thetimes.co.uk/article/fourth-jab-within-weeks-for-over-75s-as-coronavirus-restrictions-dropped-r2jmjv7qt>
12. Mishra M, Nadeem D. WHO calls for halting Covid-19 vaccine boosters in favor of unvaccinated. Reuters [Internet]. 2021 Aug 4 [cited 2021 Sep 21]; Available from: <https://www.reuters.com/business/healthcare-pharmaceuticals/who-calls-moratorium-covid-19-vaccine-booster-doses-until-september-end-2021-08-04/>
13. Ferguson K, Caplan A. Love thy neighbour? Allocating vaccines in a world of competing obligations. Journal of Medical Ethics. 2020 Dec;medethics-2020-106887.
14. Sharma S, Kawa N, Gomber A. WHO's allocation framework for COVAX: is it fair? Journal of Medical Ethics [Internet]. 2021 Apr 9 [cited 2021 Aug 12]; Available from: <https://jme.bmj.com/content/early/2021/04/08/medethics-2020-107152>
15. Covid-19 vaccine tracker: the global race to vaccinate [Internet]. [cited 2021 Jun 7]. Available from: <https://ig.ft.com/coronavirus-vaccine-tracker/>
16. Schaefer GO, Leland RJ, Emanuel EJ. Making Vaccines Available to Other Countries Before Offering Domestic Booster Vaccinations. Journal of the American Medical Association. 2021 Sep 14;326(10):903–4.
17. US disputes WHO call to delay Covid booster shots to help poorer nations. The Guardian [Internet]. 2021 Aug 5 [cited 2021 Sep 21]; Available from: <https://www.theguardian.com/world/2021/aug/05/us-disputes-who-call-to-delay-covid-booster-shots-to-help-poorer-nations>
18. Pensulo C. Malawi to bin 16,000 AstraZeneca doses amid fears of rise in vaccine hesitancy. The Guardian [Internet]. 2021 Apr 16 [cited 2022 Feb 22]; Available from: <https://www.theguardian.com/global-development/2021/apr/16/malawi-to-bin-16000-astrazeneca-doses-amid-fears-of-rise-in-vaccine-hesitancy>
19. Abuja RA. Covid vaccination rates in Africa are woefully low. Why did a million doses end up in landfill? The Times [Internet]. 2022 [cited 2022 Feb 22]; Available from: <https://www.thetimes.co.uk/article/vaccination-rates-in-africa-are-woefully-low-why-did-a-million-doses-end-up-in-landfill-5cjkhwcx8>
20. IMF-WHO-Covid-19-Vaccine-Supply-Tracker [Internet]. IMF. [cited 2021 Sep 24]. Available from: <https://www.imf.org/en/Topics/imf-and-covid19/IMF-WHO-Covid-19-Vaccine-Supply-Tracker>
21. Thomas SJ, Moreira ED, Kitchin N, Absalon J, Gurtman A, Lockhart S, et al. Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine through 6 Months. The New England Journal of Medicine. [Internet]. 2021 Sep 15 [cited 2021 Sep 24]; Available from: <https://doi.org/10.1056/NEJMoa2110345>
22. Dolgin E. COVID vaccine immunity is waning — how much does that matter? Nature [Internet]. 2021 Sep 17 [cited 2021 Sep 24]; Available from: <https://www.nature.com/articles/d41586-021-02532-4>
23. COVAX Statement on New Variants of SARS-CoV-2 [Internet]. [cited 2021 Sep 24]. Available from: <https://>

- www.who.int/news/item/08-02-2021-covax-statement-on-new-variants-of-sars-cov-2
24. Baraniuk C. How long does covid-19 immunity last? *BMJ*. 2021 Jun 30;373:n1605.
 25. Altmann DM, Boyton RJ, Beale R. Immunity to SARS-CoV-2 variants of concern. *Science*. 2021 Mar 12;371(6534):1103–4.
 26. Woldemeskel BA, Garliss CC, Blankson JN. SARS-CoV-2 mRNA vaccines induce broad CD4+ T cell responses that recognize SARS-CoV-2 variants and HCoV-NL63. *J Clin Invest* [Internet]. 2021 May 17 [cited 2021 Sep 24];131(10). Available from: <https://www.jci.org/articles/view/149335>
 27. Cele S, Jackson L, Khoury DS, Khan K, Moyo-Gwete T, Tegally H, et al. Omicron extensively but incompletely escapes Pfizer BNT162b2 neutralization. *Nature*. 2021 Dec 23;1–5.
 28. Planas D, Saunders N, Maes P, Guivel-Benhassine F, Planchais C, Buchrieser J, et al. Considerable escape of SARS-CoV-2 Omicron to antibody neutralization. *Nature*. 2021 Dec 23;1–5.
 29. UK Health Security Agency. SARS-CoV-2 variants of concern and variants under investigation in England Technical briefing 34. 2022.
 30. McKie R, Savage M, editor RMS, editor MSP. Next Covid strain could kill many more, warn scientists ahead of England restrictions ending. *The Observer* [Internet]. 2022 Feb 12 [cited 2022 Feb 22]; Available from: <https://www.theguardian.com/world/2022/feb/12/scientists-plead-caution-covid-restrictions-lifted-england>
 31. 31. Engl PH. Covid-19 vaccines have prevented 7.2 million infections and 27,000 deaths [Internet]. GOV. UK. [cited 2021 Sep 24]. Available from: <https://www.gov.uk/government/news/covid-19-vaccines-have-prevented-7-2-million-infections-and-27-000-deaths>
 32. Audi R. Nationalism, Patriotism, and Cosmopolitanism in an Age of Globalization. *The Journal of Ethics*. 2009 Dec 1;13(4):365–81.
 33. Jones C. *Global Justice: Defending Cosmopolitanism*. Oxford: University Press; 2001.
 34. Pogge T. *World poverty and human rights: cosmopolitan responsibilities and reforms*. 2nd ed. Cambridge: Polity; 2008.
 35. Tolchin B. Human rights and the requirement for international medical aid. *Developng World Bioethcs*. 2008 Aug;8(2):151–8.
 36. Ruger JP. *Health and social justice*. Oxford: University Press; 2012. xli+276.
 37. Lowry C, Schüklenk U. Two Models in Global Health Ethics. *Public Health Ethics*. 2009;2(3):276–84.
 38. Schuklenk U. Vaccine nationalism – at this point in the Covid-19 pandemic: Unjustifiable. *Developing World Bioethics*. 2021;21(3):99–99.
 39. Dworkin R. *Taking rights seriously*. Cambridge, Mass: Harvard University Press; 1978. xv+371.
 40. Cottingham J. Partiality, Favouritism and Morality. 1986;357–73.
 41. Smart JJC (John JC, Williams B. *Utilitarianism : for and against*. Cambridge: Cambridge University Press; 1973. 155 p.
 42. Herman B. The Scope of Moral Requirement. *Philosophy & Public Affairs*. 2001;30(3):227–56.
 43. Appiah KA. Dignity and global duty. *Boston University law review*. 2010;90(2):661–.
 44. Miller D. In Defence of Nationality. 1993 Apr 1;3–16.
 45. Sidgwick H. *The methods of ethics* [Internet]. London: Macmillan; 1874 [cited 2021 Sep 27]. xxiii+473. Available from: <http://purl.ox.ac.uk/uuid/f1ee7365bc0c443185e91667341d6c96>
 46. Kant I. *Groundwork for the Metaphysics of Morals* [Internet]. New Haven: Yale University Press; 2002 [cited 2015 Oct 29]. Available from: <http://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=187773&site=ehost-live>
 47. Singer P. *Famine, Affluence, and Morality*. 1972;229–43.
 48. Bollyky TJ, Bown CP. *The Tragedy of Vaccine Nationalism*. 2021 Jul 26 [cited 2021 Sep 21]; Available from: <https://www.foreignaffairs.com/articles/usa/2020-07-27/vaccine-nationalism-pandemic>
 49. Gupta R, Morain SR. Ethical allocation of future Covid-19 vaccines. *Journal of Medical Ethics* [Internet]. 2020 Dec 17 [cited 2020 Dec 19]; Available from: <https://jme.bmj.com/content/early/2020/12/16/medethics-2020-106850>
 50. Emanuel EJ, Luna F, Schaefer GO, Tan K-C, Wolff J. Enhancing the WHO's Proposed Framework for Distributing Covid-19 Vaccines Among Countries. *American Journal of Public Health*. 2021 Mar;111(3):371–3.
 51. Emanuel EJ, Persad G, Kern A, Buchanan A, Fabre C, Halliday D, et al. An ethical framework for global vaccine allocation. *Science*. 2020 Sep 11;369(6509):1309–12.
 52. Lagman JDN. Vaccine nationalism: a predicament in ending the Covid-19 pandemic. *Journal of Public Health (Oxford)*. 2021 Mar 18;fdbab088.
 53. Beaton E, Gadomski M, Manson D, Tan K-C. Crisis Nationalism: To What Degree Is National Partiality Justifiable during a Global Pandemic? *Ethical Theory and Moral Practice*. 2021 Mar 1;24(1):285–300.
 54. GOODIN RE. What is so special about our fellow countrymen? 1987.
 55. Gostin LO. *Public health law: power, duty, restraint*. Third edition. Oakland, California: University of California Press; 2016.
 56. Nussbaum MC. *Creating capabilities: the human development approach*. First Harvard University Press

- paperback edition. Cambridge, Mass. ; and London, England: Cambridge, Mass; and London, England : The Belknap Press of Harvard University Press; 2013.
57. Sangiovanni A. Global Justice, Reciprocity, and the State. *Philosophy & Public Affairs*. 2007;35(1):3–39.
58. Nagel T. The Problem of Global Justice. *Philosophy & Public Affairs*. 2005;33(2):113–47.
59. Blake M. Distributive Justice, State Coercion, and Autonomy. *Philosophy & Public Affairs*. 2001;30(3):257–96.
60. Scheffler S. Partiality. In: Feltham B, Cottingham J, editors. *Oxford University Press*; 2010.
61. Keller S. *Partiality*. Princeton, New Jersey: Princeton University Press; 2013.
62. Pugh J, Kahane G, Savulescu J. Bioconservatism, Partiality, and the Human-Nature Objection to Enhancement. 2016 Oct 1;406–22.
63. Miller D. Reasonable Partiality Towards Compatriots. 2005 Apr 1;63–81.
64. Kolodny N. Love as Valuing a Relationship. 2003;135–89.
65. Hurka T. The Justification of National Partiality. In: McKim R, McMahan J, editors. *New York ; Oxford :* Oxford University Press; 1997.
66. Arneson RJ. Extreme cosmopolitanisms defended. *Critical Review of International Social and Political Philosophy*. 2016 Sep 2;19(5):555–73.
67. WELLMAN CH. Friends, Compatriots, and Special Political Obligations. *Political Theory*. 2001 Apr 1;29(2):217–36.
68. Brock G. *Global Justice: A Cosmopolitan Account*. Oxford: University Press; 2009.
69. Kremer M, Levin JD, Snyder CM. Advance Market Commitments: Insights from Theory and Experience [Internet]. National Bureau of Economic Research; 2020 Feb [cited 2021 Nov 15]. (Working Paper Series). Report No.: 26775. Available from: <https://www.nber.org/papers/w26775>
70. Gavi - The Vaccine Alliance. What is an Advance Market Commitment and how could it help beat Covid-19? [Internet]. 2021 [cited 2022 Feb 23]. Available from: <https://www.gavi.org/vaccineswork/what-advance-market-commitment-and-how-could-it-help-beat-covid-19>
71. Snyder CM, Hoyt K, Gouglas D, Johnston T, Robinson J. Designing Pull Funding For A Covid-19 Vaccine. *Health Affairs*. 2020 Sep 1;39(9):1633–42.
72. Monrad JT, Sandbrink JB, Cherian NG. Promoting versatile vaccine development for emerging pandemics. *npj Vaccines*. 2021 Feb 11;6(1):1–7.
73. Banerjee A, Hollis A, Pogge T. The Health Impact Fund: incentives for improving access to medicines. *The Lancet*. 2010 Jan 9;375(9709):166–9.
74. Peacocke EF, Heupink LF, Frønsdal K, Dahl EH, Chola L. Global access to Covid-19 vaccines: a scoping review of factors that may influence equitable access for low and middle-income countries. *British Medical Journal Open*. 2021 Sep 30;11(9):e049505.
75. World Health Organisation. Fair allocation mechanism for Covid-19 vaccines through the COVAX Facility [Internet]. 2020 [cited 2021 Nov 15]. Available from: <https://www.who.int/publications/m/item/fair-allocation-mechanism-for-covid-19-vaccines-through-the-covax-facility>
76. Guzman J, Hafner T, Maiga LA, Giedion U. Covid-19 vaccines pricing policy options for low-income and middle-income countries. *British Medical Journal Global Health*. 2021 Mar;6(3):e005347.
77. European Commission. Annex to the Commission Decision on approving the agreement with Member States on procuring Covid-19 vaccines on behalf of the Member States and related procedures [Internet]. 2020. Available from: https://ec.europa.eu/info/sites/default/files/annex_to_the_commission_decision_on_approving_the_agreement_with_member_states_on_procuring_covid-19_vaccines_on_behalf_of_the_member_states_and_related_procedures.pdf
78. Sterri A, Skjelbred P. A Global Auction for Vaccine Allocation. Preprint, Under review.