Dose of Reality: How rich countries and pharmaceutical corporations are breaking their vaccine promises

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"I will not stay silent when the companies and countries that control the global supply of vaccines think the world's poor should be satisfied with leftovers."

Dr Tedros Adhanom Ghebreyesus, WHO Director General, 8th September 2021.[1]

SUMMARY

From the outset of the COVID-19 pandemic, public health officials and scientists warned that only global approaches to fighting the pandemic could succeed. World leaders promised any successful vaccine would be a global public good. "No one is safe until everyone is safe," is the mantra, yet pharmaceutical corporations and rich country governments persistently pursue the opposite.

Despite international efforts to establish collaborative technology sharing and equitable allocation of COVID-19 vaccines, G7 countries and the European Union (EU) have instead hoarded many more doses than they need. Pharmaceutical corporations have sold their available doses to the highest bidder in pursuit of record-breaking profits. In recent months, to justify its hoarding, the G7 and the EU have made headline-seeking promises to assist low- and middle-income countries by donating doses—yet have repeatedly delayed or broken these promises.

During the UN General Assembly in September 2021, the United States convened a vaccine-focused summit to build momentum to reach the goal of vaccinating 70 percent of every country's population by September 2022.[2] The 70 percent target is the right one but delaying until September 2022 to achieve it is too slow for those currently left behind. Furthermore, there remains no plan to deliver on this target. Instead of a plan is yet another promise to buy vaccines from multinational corporations and donate them next year. The promise, along other dose sharing promises by governments, are more examples of ineffective and inadequate charity and a missed opportunity to transform the global response.

At the UN General Assembly one year prior in September 2020, sixteen multinational pharmaceutical corporations based primarily in the U.S. and European Union, including AstraZeneca, Johnson and Johnson, and Pfizer, signed a declaration with the Bill and Melinda Gates Foundation to "support equitable and affordable distribution globally."[3] These companies, as well as Moderna[4], subsequently made other commitments to equitable access, which have yet to materialize. This includes selling doses to entities such as COVAX, the African Union, and bilaterally to low- and middle-income countries. Even at the outset, these commitments were grossly insufficient. Throughout the pandemic, these same corporations have collectively issued optimistic manufacturing projections for billions of doses to establish a narrative that the world can safely rely on their production, and yet they have failed to meet these projections, exacerbating a vaccine scarcity they helped to create while fuelling their own profits.

Today, we have a split-screen reality of runaway profits of pharmaceutical corporations and accelerating deaths in low- and middle-income countries (LMICs). While these corporations took a victory lap in September announcing that 1.5 billion doses of vaccines will be manufactured every month[5], COVAX, just the day after, had to slash, by an incredible 25 percent (from 2 billion doses to 1.4 billion doses), its estimates of total vaccines that will be delivered to LMICs in 2021.[6] This unacceptable cutback makes a catastrophic situation even worse. Since the start of the pandemic, only 0.7 percent of all manufactured vaccine doses have gone to low-income countries.[7]

This is in part because corporations such as Moderna have delivered 84 percent[8] of their vaccine doses to high-income countries[9] at exorbitant prices that brought them record-breaking profits.[10] What is clear is that the riches of the pharmaceutical industry, and the excess vaccines in wealthy countries, come at a cost to thousands of people who are dying of COVID-19 every day in poor countries, deaths that the World Health Organization (WHO) says are 'entirely preventable'.[11]

Our analysis of commitments by four major pharmaceutical companies and/or partnerships – AstraZeneca (and Oxford University), Johnson & Johnson, Moderna, and Pfizer (with BioNTech) as well as the promises of the G7 and the EU under 'Team Europe', indicates that many of the headline-seeking announcements and pledges were and are too optimistic, have not been met, are not accurate, or may only be met on a timeline that is too slow for the billions of people who need a COVID-19 vaccine now.

Our analysis[1] shows that:

- Almost half (49 percent) of the vaccines sold by AstraZeneca, Pfizer/BioNTech, Moderna, and Johnson and Johnson have been delivered to high-income countries, even though such countries only comprise 16 percent of the world's population.[12]

- The countries of the African Union (AU) collectively have a population that is three times larger than the countries of the EU. Yet the African Union Vaccine Acquisition Trust, a vaccine procurement platform, has only been able to purchase 100 million doses from Pfizer/BioNTech and Johnson and Johnson. By contrast, the EU has been able to purchase nearly 1.5 billion doses from AstraZeneca, Pfizer/BioNTech, Moderna, and Johnson and Johnson, or approximately 15 times the number of doses compared to the AU.

- Via their bilateral deals Moderna has sold an estimated nine of every ten doses to high income countries. Pfizer/BioNTech has sold eight times as many doses to high-income countries compared to doses sold to low and low-middle-income countries[13].

- None of the four companies or partnerships (AstraZeneca, Pfizer/BioNTech, Moderna, and Johnson and Johnson) have sold more than 25 percent of their vaccine supply (agreed through contracts) this year to COVAX. Pfizer/BioNTech sold only one percent of its contracted supply to the initiative, Moderna only 3 percent; and Johnson and Johnson and AstraZeneca have sold 25 and 19 percent of their supply to COVAX respectively.

- Moderna has delivered an estimated 84 percent of its supply to high-income countries while the company ignores low-income countries. To date, AstraZeneca, Pfizer/BioNTech, Moderna, and J&J have collectively delivered 47 times as many doses to high-income countries compared to doses delivered to low-income countries.[14]

[1] This report's analysis is based upon company figures, sourced by the People's Vaccine Alliance from Airfinity Limited and third party publicly reported sources, with an end date of the 12th of October 2021. All companies were invited to respond to the information included herein. All country data, including vaccine dose pledges and donations by high-income countries, is sourced either from Airfinity Limited, the Council on Foreign Relations, Our World in Data, as well as additional publicly reported sources, with an end date of 12th of October 2021.

- None of the four companies have delivered even half of the doses they promised to COVAX in 2021. Pfizer/BioNTech have delivered 39 percent of an already inadequate 40 million doses to COVAX, or 1.4 percent of the total deliveries made by Pfizer/BioNTech to date. Johnson and Johnson committed 200 million doses to COVAX in 2021 but has delivered none.[15] Moderna committed only 34 million doses to COVAX in 2021, or just 3 percent of its total production, but has also delivered none. AstraZeneca has only delivered 14 percent of its promised doses to date to COVAX.[16]

- Johnson and Johnson, AstraZeneca and Moderna will fall short of their self-declared production targets for this year. Collectively, the four companies (AstraZeneca/Oxford, Moderna, Johnson and Johnson, Pfizer/BioNTech) claimed they would manufacture an estimated 7.5 billion doses in 2021, yet, as of October 12th, more than nine months into the year, the corporations have only delivered 3.7 billion doses. The companies are projected to manufacture only 6.2 billion doses in 2021, a 17 percent shortfall of their own projections, which translates into more than 1.3 billion missing doses this year.

- Just 14 percent, or 261 million of the 1.8 billion donated doses promised by the G7 and Team Europe (the EU plus Iceland and Norway) have been delivered to low- and middle-income countries[17]. Inexplicably, G7 countries and Team Europe have donated over 10 million doses to other high-income countries during the pandemic, or 4 percent of total donations they have provided throughout the pandemic.

- At least 100 million vaccine doses could go unused and expire in G7 countries in 2021, and the number of wasted doses could reach up to 241 million. Furthermore, based on their current donation pledges, the number of wasted doses could rise to 800 million by mid-2022 due to expiration.[18]

- Despite extreme vaccine shortages in developing countries, Canada and the United Kingdom took an estimated 1.5 million doses from COVAX this year.[19] Meanwhile the two countries have barely delivered on their vaccine donation pledges – the UK and Canada have delivered only 9.6 percent and 8 percent of promises doses, respectively.[20]

Instead of working together to support common sense proposals to vaccinate the world as quickly as possible, the G7, the EU and the pharmaceutical corporations have signed a 'devil's pact' – wealthy countries hoard doses and break promises, while pharmaceutical corporations exploit their monopolies to earn record profits. The consequences are devastating. First, an entirely avoidable global vaccine apartheid leading to hundreds of thousands, if not millions of needless and tragic deaths. Second, a prolonged pandemic that continues to jeopardize public health everywhere and the global economy. The Economist Intelligence Unit estimates that countries that vaccinate less than 60 percent of their countries by mid-2022 will suffer GDP losses of $2.3 trillion dollars between 2022 and 2025, with LMICs shouldering two-thirds of these losses.[21]

When we fail to vaccinate most of the world's population, the virus spreads and mutates into ever more dangerous forms. The emergence of new variants, including Delta, threatens the gains made even in rich countries. The pandemic is also causing major disruption to global supply chains and destroying livelihoods. Women are likely to be hardest hit by this crisis as they are predominantly in the worst-paid, least secure jobs. Half a billion people, of which twice as many are women than men, are now under-employed or out of work. Oxfam recently estimated that the COVID-19 crisis cost women around the world at least $800 billion in lost income in 2020, equivalent to more than the

combined Gross Domestic Product of 98 countries.[22] The only winners are a handful of pharmaceutical corporations, their executives, and wealthy shareholders.

Pharmaceutical corporations claim that intellectual property rules were necessary to develop the vaccines,[23,24] but they conveniently ignore that they accepted and relied upon decades of publicly funded research that was critical to develop them. Also ignored are the substantial subsidies and advanced purchase commitments that paid for clinical development and manufacturing, lowering the risk of their investments. All four corporations have refused to share their know-how and intellectual property with the WHO's COVID-19 Technology Access Pool (C-TAP), set up expressly for increasing access to vaccines and other lifesaving tools.[25] Furthermore, bilateral partnerships, especially those signed by Johnson and Johnson and AstraZeneca, have been accompanied by restrictions and obligations that limit the total number of suppliers and dictate where each manufacturer can sell its product. An agreement between Johnson & Johnson and a South African manufacturer, for example, included measures to facilitate delivery of vaccine supply to Europe despite the urgent needs on the African continent.[26]

Overall, pharmaceutical corporations, aided and abetted by wealthy countries, continue to block manufacturers in developing countries from helping to ramp up production and boost supplies for countries without vaccine access. This is even though significant capacity exists – manufacturers in low-and middle-income countries currently are producing nearly two-thirds of all COVID vaccines.[27] For example, Pfizer/BioNTech and Moderna have spent most of the pandemic refusing to work with or ignoring many producers situated in low- and middle-income countries, or as is the case recently with Pfizer, only signing 'fill and finish agreements'[28] that do not expand supply of the drug substance. Such agreements also do not enable LMICs to produce enough supplies for their own populations independent of corporate control.

More recently pharmaceutical corporations claim that since wealthy countries have achieved high vaccination rates and have secured enough doses for boosters, they can now shift their attention to access in poorer countries by redistributing surplus doses. This approach smacks of greed, racism, and colonialism, that lives in LMICs are of lesser value and that protecting them can wait until the rich world is vaccinated first. Meanwhile, rich countries claimed they would share doses to vaccinate the world but have failed to do so with any urgency or at any significant scale. This even with over one billion doses projected to go unused by the end of 2021,[29] many of which may expire and will be thrown away.[30] At the same time, rich countries are embarking on programs to provide a booster dose to potentially most of their already vaccinated populations – further depriving LMICs of supplies for first doses while boosting the eyewatering profits of pharmaceutical corporations. When the Biden Administration announced its booster plan in mid-August, Moderna's 2022 revenue forecast temporarily jumped 35 percent, with an expectation of $13 billion in profit from its COVID-19 vaccine sales next year.[31]

The time has come for governments to decide if they want to continue down a road of inadequate gestures and broken promises, protecting the extreme profits of a few and leaving a legacy of needless loss and suffering, or to chart a new course that will protect all people and provide the fastest exit route from the pandemic.

To ensure COVID-19 vaccines are universally available, affordable, and free of charge at the point of care as soon as possible, the People's Vaccine Alliance calls on world leaders to:

1. Suspend intellectual property rights by agreeing to the proposed waiver of the TRIPS Agreement at the World Trade Organisation
2. Demand and use all legal and policy tools to require pharmaceutical corporations to share COVID-19 data, know-how, and technology with the COVID-19 Technology Access Pool and WHO-South Africa mRNA Technology Transfer Hub without restrictions.
3. Invest in decentralised manufacturing hubs worldwide to move from a world of vaccine scarcity to one of vaccine sufficiency in which LMICs have direct control over sufficient production capacity to meet their needs.
4. Immediately redistribute vaccines equitably with all countries to achieve the WHO target of vaccinating 40 percent of people in all countries by the end of 2021 and 70% of all people by mid-2022.

INTRODUCTION

'The genius and perseverance of our scientists has given us safe and effective vaccines against COVID-19. Now our most pressing task is to use them to protect humanity as swiftly as possible.'

Boris Johnson, Prime Minister of the United Kingdom, 2021 G7 Leaders' Summit

During the first 18 months of the COVID-19 pandemic, the world has been hostage to vaccine hoarding by rich nations and profiteering by drug corporations. Yet this was not pre-ordained.

At the outset of the pandemic and building on the success of expanding access to antiretroviral medicines and other medical technologies over the last two decades, many low- and middle-income countries (LMICs) and civil society organisations supported measures to make COVID-19 vaccines a global public good, including the launch of the COVID-19 Technology Access Pool (C-TAP) in May 2020.

Yet efforts to encourage corporations to collaborate were ignored by the G7 and EU and criticised as 'nonsense' and 'dangerous' by pharmaceutical corporations.[32] These multinational corporations and governments have instead insisted on their own approach, summarised as the following:

- G7 countries and the European Union (EU) provide massive public subsidies to pharmaceutical corporations[33] to complete development and manufacture of publicly funded vaccine technologies, even as these corporations maintain the sole power to determine how many vaccines to produce, where to send them, and at what price.
- G7 countries and the EU aggressively reserve and hoard large number of vaccines – including buying more doses than required at higher prices than necessary – directly depriving poorer nations of vaccine doses needed even to protect front line workers and the most vulnerable.
- The outsized profits of pharmaceutical corporations, obtained by selling high-priced and publicly subsidized COVID-19 vaccines to wealthy countries, mint at least nine new vaccine billionaires.[34]

In response to an alarming trend of vaccine hoarding, and the unwillingness of pharmaceutical corporations based in the U.S. and Europe to share vaccines recipes and intellectual property (IP), more than one hundred LMICs and an increasing number of high-income countries (HICs), have thrown their support behind a proposal from India and South Africa to temporarily suspend IP rules for COVID-19 technologies. There have also been multilateral efforts to expand manufacturing, particularly through the creation of mRNA manufacturing hubs, led by WHO and with a first hub under construction in South Africa.

Far from supporting these common-sense solutions, the G7, EU, and pharmaceutical corporations have offered a series of headline-seeking promises to donate or sell COVID-19 vaccine doses to LMICS. A summit hosted by the U.S. in September 2021 brought together a collection of new and recycled pledges by rich country governments and pharmaceutical corporations to vaccinate 70 percent of every country's population by September 2022.[35] Yet there is no plan to achieve it. The approach remains focused on inadequate charity and non-binding donation pledges instead of legally binding sharing, collaboration, and cooperation. This approach will not work.

This brief examines whether the promises and pledges made by four pharmaceutical corporations and partnerships – Moderna, Johnson & Johnson (J&J), AstraZeneca/Oxford, and Pfizer/BioNTech, as well as by G7 governments and Team Europe (the EU plus Norway and Iceland), have been met. This matters, not only because such pledged doses are often the 'only line of defence' some recipient governments can rely on during this troubling period of the pandemic, but because trickle-down

vaccine charity has been the usual defence of the G7 and the EU to criticism of vaccine hoarding and profiteering by pharmaceutical corporations.

Data[2] analysed by the People's Vaccine Alliance confirms that announcements and pledges that grabbed global headlines were either too optimistic, have not been met, are not accurate or may eventually be met but on a timeline that is too slow for the millions of people that are waiting for a COVID-19 vaccine.

The findings show that people in low-and middle-income countries cannot trust and should not have to rely on the charitable goodwill of rich nations and pharmaceutical corporations to fulfil their right to protection from COVID-19. The time has come for all governments, starting at the G20 Summit in October 2021, to collectively decide if they want to continue down a road of broken promises, or to find a new way forward that can protect us all and enable the world to exit the pandemic.

[2] This report's analysis is based upon company figures, sourced by the People's Vaccine Alliance from Airfinity Limited and third party publicly reported sources, with an end date of the 12th of October 2021. All companies were invited to respond to the information included herein. All country data, including vaccine dose pledges and donations by high-income countries, is sourced either from Airfinity Limited, the Council on Foreign Relations, Our World in Data, as well as additional publicly reported sources, with an end date of 12th of October 2021.

CHARITY IS NOT SOLIDARITY

'We need to develop a vaccine, we need to produce it and to deploy it in every corner of the world and make it available at affordable prices. This vaccine will be our universal common good.'

Ursala Von Der Leyen, President of the European Commission, 24th April 2020[36]

In April 2020, as the full gravity of the COVID-19 pandemic came into focus, world leaders, foundations, pharmaceutical corporations, and global health agencies assembled for the launch of a new initiative, known as the Access to COVID-19 Technologies Accelerator (ACT-A), to ensure rapid, affordable, and universal access to vaccines (and treatments and diagnostics) to overcome the disease. Participants promised to support universal access to vaccines, or in their words, to ensure vaccines would be a 'global public good' that was accessible and affordable to all.[37]

The launch of the ACT-A was followed by the founding of COVAX, a multilateral pooled procurement mechanism that purchases COVID-19 vaccines on behalf of participating countries and seeks to equitably allocate vaccines to each country, with a particular focus on ninety-two low- and middle-income countries deemed most likely to require financial and logistical assistance with procurement and delivery.[38] At the outset COVAX was optimistic that it could secure doses on behalf of LMICs through solidarity as well as supply from pharmaceutical corporations.[39]

COVAX's failure to push approaches that would have maximised the production of vaccines including open licensing and shared technology, meant that its strategy relied only on securing supply through purchases on the open market from pharmaceutical corporations – often in competition with the same rich countries that provide COVAX with funding. These purchases were not just dependent on the willingness of high-income countries to forego vaccine hoarding but also dependent upon the overall vaccine production targets and vaccine allocation policies set by each pharmaceutical corporation.[40]

By the end of 2020, just as vaccines were starting to obtain emergency use authorisation, the outlook looked grim. One analysis issued by the People's Vaccine Campaign estimated that 67 low- and low-middle-income countries would only be able to vaccinate one in ten people against COVID-19 in 2021, while wealthy nations had already bought up enough doses to vaccinate their entire populations nearly three times over.[41] Rich nations representing just 14 percent of the world's population had already bought up more than half of the most promising vaccines.[42]

The promise of solidarity and working in cooperation to achieve vaccines for all worldwide had already died by the end of 2020. In its place emerged a series of charitable promises, by corporations, the G7, and the EU, to give the impression they were committed to filling the vaccine void for LMICs. This brief examines those promises made by rich countries and pharmaceutical corporations based in the United States and Europe – with a focus on Pfizer/BioNTech, Moderna, Johnson and Johnson, and AstraZeneca/Oxford. While vaccine production and access should depend on the efforts of many countries, companies, and institutions, it is the G7, EU, and these pharmaceutical corporations that have dictated the international response to COVID-19, including through the promises they have made to the rest of the world.

The next sections of this report examine what those promises were, and whether they have been fulfilled.

FALSE CORPORATE OPTIMISM, TRUE CORPORATE GREED

'The biopharmaceutical industry is acutely aware of the enormous responsibility we have to patients and society to engage in unprecedented levels of collaboration to find the solution to COVID-19. (…) We are proud to be part of this landmark global partnership and are fully committed to its goal to accelerate development, production and equitable global access to safe, effective and affordable COVID-19 therapeutics and vaccines. In the fight against COVID-19 we must ensure that no-one is left behind.'

Thomas Cueni, Director General, International Federation of Pharmaceutical Manufacturers & Associations, 24th April 2020.

Pharmaceutical corporations have relied on publicly funded technologies, subsidies (at least an estimated 93 billion Euros, or over $100 billion, from the public sector) and advanced purchase commitments to pay for the development of medical technologies to address COVID-19.[43] Yet instead of using their public investment to condition how the resulting know-how and intellectual property should be managed, what price should be charged for COVID-19 technologies, what quantities should be manufactured, and how to assure equitable access – governments allowed and enabled the privatization and monopolisation of these life-saving tools. Rich nations then rushed to secure themselves enough supply to vaccinate their populations – by December 2020 a handful of countries had purchased enough doses to do so nearly three times over.[44] Repeated promises by rich country leaders of a vaccine as a 'global public good' were broken at the first opportunity.

Left to their own devices, pharmaceutical corporations ignored appeals by LMICs, civil society, the World Health Organization (WHO) and other international organisations, to share COVID-19 vaccine recipes and intellectual property with the newly established COVID-19 Technology Access Pool (C-TAP).[45] The mechanism was established to facilitate voluntary sharing by pharmaceutical corporations and other vaccine developers of technology and intellectual property for new vaccines with manufacturers worldwide. With few exceptions, they also mostly ignored manufacturers in LMICs that could have made up-front investments in scaling up production to vaccinate the world, much as the Serum Institute of India did after signing bilateral agreements with AstraZeneca[46] and Novavax[47] in 2020.

What pharmaceutical corporations did do is issue a range of promises, guarantees, supply contracts, and statements to create the appearance of acting in the best interests of all countries. These promises, time and again, have been held up as examples of why proposals to decentralise production, share vaccine recipes, and waive intellectual property rights, do not need to be implemented. This section explores some of the major promises and agreements made by Johnson and Johnson (J&J), AstraZeneca/Oxford, Moderna, and Pfizer/BioNTech, and whether they have been fulfilled.

Equitable allocation and timely delivery of vaccines

During the UN General Assembly in 2020, sixteen American, European, and Japanese corporations (including AstraZeneca, Pfizer, and Johnson and Johnson), partnered with the Bill and Melinda Gates Foundation to sign a 'Declaration' that was intended to establish certain voluntary principles that drug corporations would implement. Whether drug corporations did this to assuage fears, or simply hide their true plans, the declaration included a commitment to 'support effective and equitable distribution of these innovations (e.g., vaccines) globally.' In particular, the 'Declaration' states:

We will strive towards equitable allocation of our products and support global mechanisms like COVAX, recognizing the most effective approach to equitable access will vary across vaccines, therapeutics, and diagnostics. (…) In doing so, we support evidence-based prioritization so that health care workers, high-risk individuals, and other priority groups identified by WHO and other health authorities are protected for the duration of the pandemic, regardless of the country they live in. We will advocate for equitable distribution, recognizing that sovereign nations have final decision-making authority.[48]

Moderna did not sign the Declaration, although it had previously signed a funding agreement with the Coalition for Epidemic Preparedness Innovations (CEPI), which provided nearly $1 million in funding to the company to develop its COVID-19 vaccine, in exchange for which the company would adhere to CEPI's 'equitable access principles."[49]

How did the companies perform?

Equitable allocation

Cumulatively, 49 percent of the vaccines sold by these four corporations and partnerships have been delivered to high-income countries, even though such countries only comprise 16% of the world's population.[50]

The African Union (AU) has a population nearly three times the size of the European Union (EU). Despite its efforts to purchase vaccines for the continent through the African Vaccine Acquisition Trust (AVAT), which is an additional procurement channel to supply countries in the AU (in addition to COVAX and bilateral purchases by AU Member States), the AU has only been able to secure an additional 100 million doses from J&J and Pfizer/BioNTech. This stands in stark contrast to the EU, which secured nearly 1.5 billion doses of vaccine from the four companies, or approximately fifteen times the number of doses secured by the AU. See Table 1

Table 1: African Union and European Union procurement agreements with AstraZeneca, J&J, Moderna, and Pfizer/BioNTech (for 2021)

Vaccine (Company)	Sales to African Union in 2021	Sales to European Union in 2021
Ad26COVS1 (J&J)	50,000,000	240,000,000
BNT162b2 (Pfizer and BioNTech)	50,000,000	600,000,000
mRNA-123 (Moderna)	0	310,000,000
AZD1222 (Oxford and AstraZeneca)	0[51]	300,000,000
TOTAL	100,000,000	1,450,000,000

The worldwide figures are not much better with respect to the sales of vaccines by each pharmaceutical corporation to countries based on World Bank country classification of economies (Low income, Lower-middle income, Upper-middle income, High income, excluding sales to COVAX), although amongst its peers, Moderna performs especially poorly, while AstraZeneca performs better.

In 2021, with respect to bilateral agreements with individual countries and the EU, Moderna sold 93.5% of its doses to high-income countries. By contrast, AstraZeneca sold 32.5 percent of its doses to high-income countries. Johnson & Johnson sold 87 percent of its doses to high-income countries this year and only 3% of its doses to low and low-middle income countries, while Pfizer/BioNTech sold 67 percent of their doses to high-income countries, or 8 times more than it sold to low-middle income

countries. None of the companies sold vaccines directly to low-income countries. Table 2 provides a breakdown of bilateral agreements by the four corporations with all countries based on economic development (while excluding donations and sales to COVAX). Table 2 includes the EU within the high-income category (although Bulgaria, an EU Member State, is an upper-middle income country) and does not include the 100 million doses acquired by the African Union via the African Vaccine Acquisition Trust (AVAT).[52]

Table 2: Government agreements (excluding country-to-country donations and sales to COVAX and AVAT) with AstraZeneca, J&J, Moderna, and Pfizer/BioNTech (for 2021)[53]

	Total sales of COVID-19 vaccine doses for 2021.	% of bilateral & European Union sales
Ad26COVS1 (J&J)	555,450,000	
High-income	482,150,000	87%
Upper-middle-income	58,300,000	10%
Lower-middle-income	15,000,000	3%
Low-income	0	0%
AZD1222 (University of Oxford/AstraZeneca)	2,989,970,000	
High-income	975,000,000	32.5%
Upper-middle-income	525,870,000	17.5%
Lower-middle-income	1,488,400,000	50%
Low-income	0	0%
BNT162b2 (Pfizer/BioNTech)	2,613,850,000	
High-income	1,747,000,000	67%
Upper-middle-income	647,000,000	25%
Lower-middle-income	219,850,000	8%
Low-income	0	0%
mRNA-1273 (Moderna)	968,400,000	
High-income	907,000,000	93.5%
Upper-middle-income	35,500,000	3.5%
Lower-middle-income	25,200,000	3%
Low-income	0	0%

Not only have the companies (except for AstraZeneca) oversold directly to high-income countries and undersold to poor countries (as per Table 2 above), but they have all also undermined COVAX by failing to sell enough doses for the facility to succeed in 2021. None of the four companies have sold more than 25 percent of their sales this year to COVAX. Pfizer/BioNTech sold only 1.5 percent of its supply to COVAX, while the figures for Moderna, AstraZeneca and Johnson and Johnson are 3, 19 and 25 percent, respectively.[54] See Table 3.

Table 3: Percentage of total doses sold (excluding donations) by AstraZeneca, J&J, Moderna, and Pfizer/BioNTech to COVAX (for 2021)[55]

Vaccine (company)	Sales to COVAX	Total global sales	% of total sales to COVAX
Ad26COVS1 (J&J)	200,000,000	805,450,000	24.8%
AZD1222 (University of Oxford/AstraZeneca)	720,000,000	3,728,390,000	19.3%
BNT162b2 (Pfizer/BioNTech) *	40,000,000	2,716,050,000	1.5%
mRNA-1273 (Moderna)	34,000,000	1,002,400,000	3.4%
Total	994,000,000	8,252,290,000	12.0%

*Excludes USA facilitated deals

Timely delivery of doses to low- and middle-income countries

In a pandemic, equitable allocation of vaccines applies to timing of delivery and not just volume of secured supplies. Vaccines are of no value if they arrive after people have been infected and died. It is neither equitable nor ethical to make health workers on the front line, or vulnerable populations in some countries wait for protection until entire populations, including healthy adults and children, have been vaccinated in wealthy countries. This can have a particularly negative impact upon women and girls. Women and girls experience emergencies differently and COVID-19 is no exception. Women are likely to be hardest hit by this crisis. Women – and particularly women from marginalised social groups – are disproportionately represented in low-paying, insecure jobs that offer few protections, such as sick leave. Women also carry out the lion's share of unpaid-caring for out of school children and for friends and family suffering illnesses – all of which has been exacerbated by lockdowns, closed schools, struggling health systems and the direct and indirect health impacts of the pandemic.

Much fanfare was made of the fact that COVAX began shipping small supplies of vaccine doses to low-and middle-income countries in February 2021, only two months after the very first vaccine doses were administered for COVID-19 in the United Kingdom. However, any perception of momentum and progress in vaccinating people in LMICs was quickly undermined – not only by the inadequate volumes of doses secured by COVAX and bilaterally by LMICs from pharmaceutical corporations, but also because COVAX and LMICs were and are being pushed to the back of the vaccine queue as companies prioritise delivering doses for their more lucrative contracts with rich country governments. Data on actual deliveries of doses to COVAX and bilaterally to all countries in comparison to the promises made (see Table 4 below) show this to especially be the case for Pfizer/BioNTech and Moderna. Table 4 shows committed sales by pharmaceutical corporations to LMICs, COVAX, and the AU. Doses purchased by high-income countries that are subsequently donated to LMICs or COVAX are excluded from Table 4, whereas at least one company[56] requested such donations be included if such doses eventually reached LMICs.

Table 4: Expected and actual (to date) deliveries of doses by AstraZeneca, J&J, Moderna, and Pfizer/BioNTech (for 2021) excluding donations. [57]

	Johnson & Johnson (Ad26COVS1)		University of Oxford and AstraZeneca (AZD1222)		Pfizer/BioNTech (BNT162b2)		Moderna (mRNA-1273)	
	Supply secured	Delivery (%)	Supply secured	Delivery (%)	Supply secured	Delivery (%)	Supply secured	Delivery (%)
COVAX	200,000,000	0 (0%)	720,000,000	104,243,740 (14%)	40,000,000	15,709,500 (39%)	34,000,000	0 (0%)
African Union (AVAT)	50,000,000	5,342,200 (11%)	0	0 (0%)	50,000,000	0 (0%)	0	0
High-income	482,150,000	82,863,111 (17%)	975,700,000	307,794,939 (32%)	1,747,000,000	1,184,129,529 (68%)	907,700,000	427,710,530 (47%)
Upper-middle income	58,300,000	9,177,250 (16%)	525,870,000	200,107,780 (38%)	647,000,000	264,253,959 (41%)	35,500,000	3,393,800 (10%)
Lower-middle-income	15,000,000	0 (0%)	1,488,400,000	994,823,200 (67%)	219,850,000	28,060,290 (13%)	25,200,000	3,357,000 (13%)
Low-income	0	0 (0%)	0	0 (0%)	0	0 (0%)	0	0 (0%)

As of 12th October 2021, Moderna has shipped an estimated 126 times as many doses to high-income countries compared to low and low-middle income countries.[58] The company has committed just 3 percent of its total production for 2021 (or 34 million doses) to COVAX but has delivered none of the doses.[59] The only Moderna vaccines delivered to low-income countries are due to government donations of unwanted doses.

None of the four companies have delivered even half of the doses they promised to COVAX. Pfizer/BioNTech has delivered 39 percent of the already inadequate 40 million doses sold to COVAX.[60] The delivered doses to COVAX constitute just 1.3 percent of the total deliveries made by Pfizer/BioNTech to high income countries to date. Not only has Pfizer/BioNTech sold very few doses to COVAX, but Pfizer, which only wanted the doses sold to COVAX to go to the poorest countries, entered a 'standoff' with COVAX, which could only be resolved by the US government purchasing the doses and donating them to poor countries itself.[61] This move meant the US government had to divert scarce funds away from strengthening vaccine distribution in poor countries and instead pay them into Pfizer's already overflowing coffers.[62]

Johnson and Johnson, which committed 200 million doses to COVAX in 2021, has delivered none of these doses.[63] Only 11 percent of the 50 million doses the company sold to the African Union in 2021 have been delivered.[64] This is particularly shameful and difficult to accept in light of evidence that the corporation had been actively exporting its vaccine doses manufactured in South Africa to countries in Europe, at a time when Europe had more than enough doses to supply its immunisation programs, while the pandemic was worsening on the African continent.[65] Currently, more than 64 percent of the population in the EU is now fully vaccinated, compared to only 4.8 percent of all people on the African continent.[66]

The company could export the doses made in South Africa to Europe due in part to its hardball tactics, which pressured the South African government to waive its right to impose export restrictions.[67] In

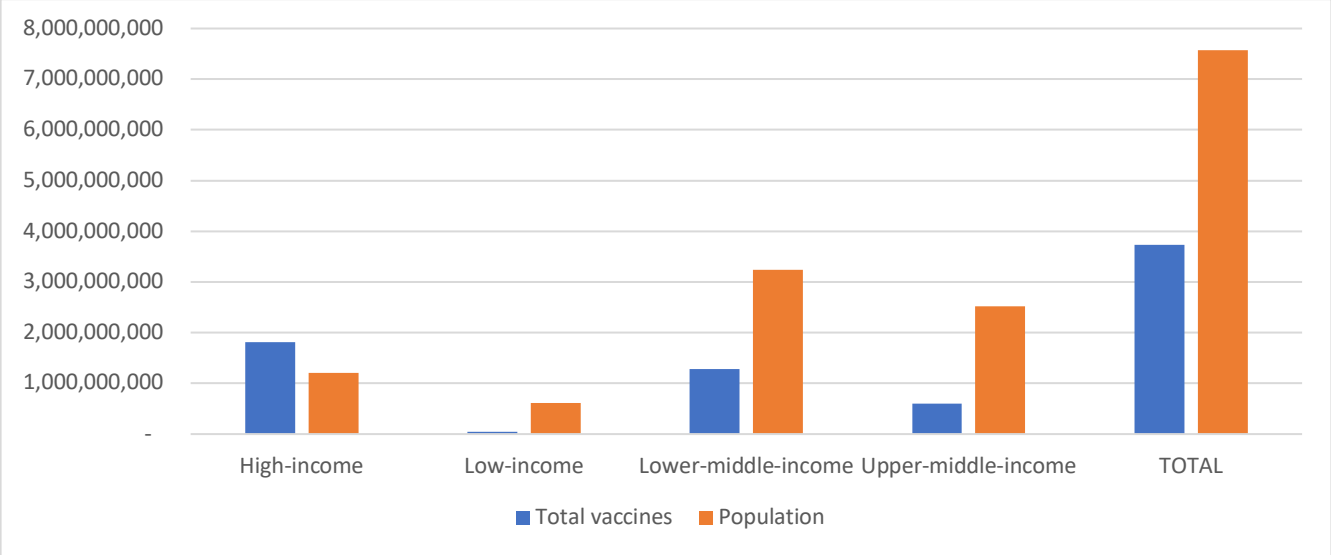
September 2021, Johnson and Johnson's Chief Scientific Officer belatedly announced that all vaccines produced in Africa should remain in Africa (or go to COVAX countries).[68] This announcement was 'too little, too late' for people on the African continent that did not get the single-shot dose in time to avoid unnecessary illness, death, and onward transmission of the virus. Furthermore, there is no clarity as to whether the company and the EU have replaced or returned the doses it wrongly removed from South Africa.[69]

While AstraZeneca (and its partners) should be credited for manufacturing more than 1.6 billion doses for use in 170 countries (making its COVID-19 vaccine the broadest in use globally)[70], the company has also failed COVAX by delivering only 14 percent of promised doses. This is due in part to its decision to concentrate a significant percentage of its production in one company, the Serum Institute of India. By doing so AstraZeneca did not plan for a worst-case scenario, such as a manufacturing setback or, as it transpired, that India would face a severe crisis due to a new variant (the Delta variant) and would restrict the export of COVID-19 vaccines from the country.[71] The decision to concentrate production with one company meant many countries have been left with delayed or no supply even as the pandemic was and is worsening. The government of India thereafter announced that no more vaccines will be supplied to COVAX from India until every adult has been vaccinated.[72] (In September 2021, the Indian government did announce it would once again allow for exports of vaccine doses from India from October 2021,[73] although the chief executive of the Serum Institute has since indicated that exports will be small for the remainder of this year.[74])

This narrow-sighted approach could have been avoided in part if AstraZeneca (and the inventor of the vaccine, Oxford University), had opted to share the vaccine technology, know-how and intellectual property with the WHO-hosted COVID-19 Technology Access Pool, which could have enabled other companies to step forward and produce the vaccine, including without the export restrictions imposed on Indian manufacturers.

Overall, the inequitable sales of vaccines primarily to the richest countries, compounded by delays in delivering doses to COVAX and LMICs, has meant that while high-income countries have a surplus of doses compared to their total population, all other countries are lacking the doses they need. Figure 1 illustrates the disparity of deliveries across countries for all vaccines according to country income classification.

Figure 1: Total deliveries of all vaccines to countries based on World Bank classification compared to total population. Donated doses are attributed to the final recipient (as of 12th October 2021)



Even now, with COVAX having slashed its forecasts for 2021 by 25 percent due to broken promises from companies, there may be no guarantee that the reduced number of doses materialise from pharmaceutical corporations, especially as G7 countries and the EU order more doses this year, and as multinational companies aggressively push for sales of booster doses to these same countries. On the other hand, if doses are delivered late but all at once and with little warning, recipient countries may have difficulty planning to absorb and administer the doses before expiration. The possibility that COVAX may receive and distribute up to 1.1 billion doses in the remaining weeks of 2021 has officials in poor countries fearful that the 'abrupt surge could overwhelm their health systems and lead to much-needed vaccines going to waste.'[75]

Overall production targets of pharmaceutical corporations

The handful of pharmaceutical corporations with approved vaccines for COVID-19 have consistently claimed that sufficient supply could be produced for the world solely by them and their selected partners. Indeed, pharmaceutical corporations would have us believe, as the CEO of Pfizer noted in an August 2021 interview with the Financial Times, that such companies are 'the most efficient machine to convert raw materials to doses.'[76]

In 2020, vaccine manufacturers collectively predicted that they would manufacture 837 million doses, and yet by the end of the year had only produced 31 million doses, thereby missing their target by 96 percent.[77] In March 2021, as concern increased that there was neither adequate supply nor equitable distribution, and as demands multiplied for a temporary waiver of IP rules related to COVID-19 technologies, pharmaceutical companies worldwide, backed by global health agencies such as the Coalition for Epidemic Preparedness Innovations (CEPI), hastily convened a meeting hosted by Chatham House and issued an estimate of 14 billion total doses that could be manufactured in 2021 by all manufacturers.[78] That meeting, and the estimate, was widely interpreted at least by civil society organisations as an attempt to respond to (and therefore forestall) the growing demands for a radical shift in the international efforts to assure adequate supply.

Since then, as deaths and suffering continue to multiply in LMICs without vaccines, pharmaceutical corporations have again sought to reset the narrative regarding their ongoing failures to supply doses to these countries. In early September 2021, the International Federation of Pharmaceutical Manufacturers Association (IFPMA), a lobby group representing American and European drug corporations, released a report claiming that 1.5 billion COVID-19 vaccine doses were being produced a month, and a total of 12 billion would be made by the end of 2021. The new estimate was a 15 percent reduction from the estimate claimed previously in March.[79]

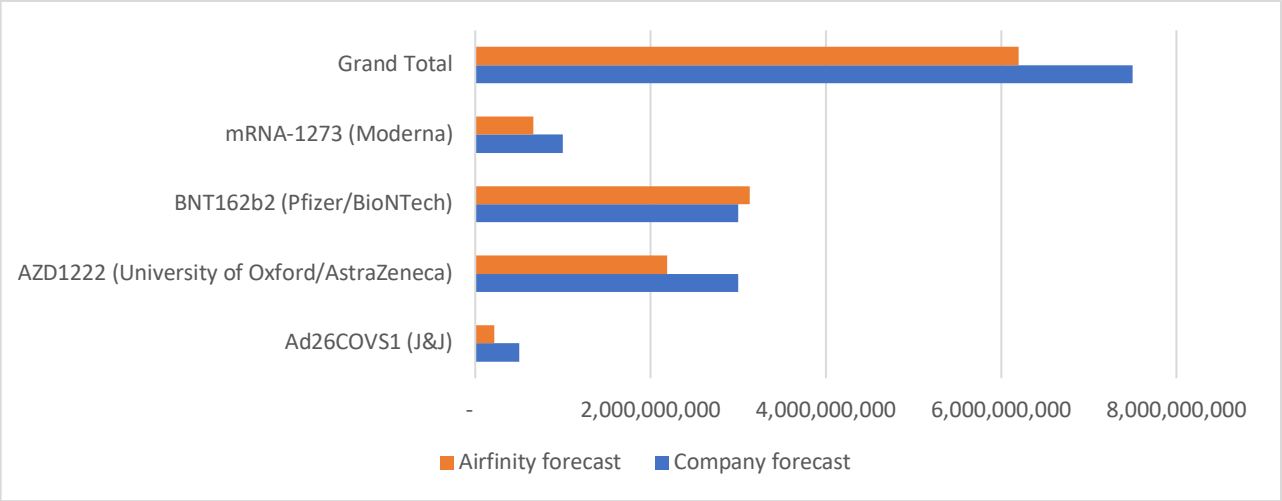
These most recent estimates also rely heavily on counting production from companies from China, Russia, and India which like their counterparts in the U.S. and Europe are supplying large domestic populations while providing doses either through sales or donations to LMICs. If current projections hold, pharmaceutical companies from India, China, and Russia, which have mostly been ignored during the pandemic by multinational drug corporations as possible manufacturing partners, will have produced upwards of 5.4 billion doses this year, or 60 percent of total global production.[80] China's announcement of having vaccinated one billion people domestically[81] should be celebrated as an achievement, but perhaps is also a reminder that there may have been much greater production potential for Chinese companies through licensing agreements with multinational companies directly or via the COVID-19 Technology Access Pool.

At present, AstraZeneca, J&J, Pfizer/BioNTech, and Moderna will fall short of their production targets for this year. Collectively, the four companies claimed they would manufacture an estimated 7.5 billion doses in 2021, yet the corporations, with less than three months left until the end of the year, have so far only delivered 3.7 billion doses, or just 50 percent of their end of year production target. Airfinity forecast the companies will produce 6.2 billion doses by the end of the year, a 17 percent shortfall of the original forecasts, which translates into more than 1.3 billion missing vaccine doses. Table 5 and Figure 2 below presents the vaccine production projections stated by pharmaceutical corporations against the estimated production totals forecasted by data analytics company Airfinity for 2021.

Table 5: COVID-19 vaccine production projections by AstraZeneca, J&J, Moderna, and Pfizer/BioNTech and independent projections of production (for 2021)[82]

	Company forecast	Airfinity forecast	Airfinity vs company forecast %
Ad26COVS1 (J&J)	500,000,000[83]	215,941,044	43%
AZD1222 (University of Oxford/AstraZeneca)	3,000,000,000[84]	2,188,574,755	73%
BNT162b2 (Pfizer/BioNTech)	3,000,000,000[85]	3,128,364,537	104%
mRNA-1273 (Moderna)	1,000,000,000[86]	663,159,431	83%
Total	7,500,000,000	6,196,039,767	83%

Figure 2: COVID-19 vaccine production projections by pharmaceutical corporations and independent projections of production for 2021[87]



There needn't have been such extreme inequality in access across the world. These corporations could have signed many more licensing and technology transfer agreements, for example via C-TAP, with the WHO-South Africa mRNA vaccine hub, or with companies in India, China, Russia and other LMICs, and required these firms to sell doses equitably and affordably to LMICs. This would have ensured both expanded supply of their vaccines, and measures to ensure their affordability and equitable use.

Does it matter when supply exceeds demand?

In its announcement in September 2021, IFPMA implied 'Mission Accomplished', referring both to the total production for the rest of 2021, and an inflection point in 2022 when demand will exceed supply. Such 'surplus', if it does come to pass, is better than scarcity, and yet it is rooted in a mistaken belief that a surplus will be distributed fairly between all countries and not be wasted or used needlessly.

At least 100 million doses of vaccines could be wasted by the G7 alone in 2021 due to expiration, a figure which could rise to 241 million doses (a quarter of the total G7 and EU surplus stock) if recipient governments rightly refuse to accept vaccines without at least two months of remaining shelf life.[88] Furthermore, based on their current donation pledges, the number of wasted doses could rise to 800 million by mid-2022 due to expiration of unused vaccine doses.[89] In addition to expired vaccines, another significant source of wastage around the world is the inability to administer all the doses in multi-dose vials, with more doses per vial associated with greater wastage.[90]

Pharmaceutical corporations and wealthy countries have also consistently prioritised low-risk populations in wealthy countries over those at highest risk in the poorest countries. The accelerating use of booster doses in wealthy countries (see below) is just a continuation of rich countries vaccinating those at lowest risk in lieu of meeting pledges made to the world's poorest people.

Finally with the inevitable rise of vaccine-resistant variants, there is uncertainty about the ongoing effectiveness of current and pipeline COVID-19 vaccines.[91] Nothing should be taken for granted regarding the availability of effective vaccines, and the threat of variants reinforces the case for diversified manufacturing worldwide with all countries or regions having the capacity and know-how to adapt and produce vaccines in response to changing needs, and not based on rich country charity.

THE G7 AND EU: 'GIVE A LITTLE WITH ONE HAND, TAKE A LOT WITH THE OTHER'

'But we also know that to beat the pandemic here, we need to beat it everywhere. And I made and I'm keeping the promise that America will become the arsenal of vaccines as we were the arsenal of democracy during World War Two."[92]

United States President Joseph Biden, White House COVID-19 Summit, 22nd September 2021

Instead of working with counterparts in LMICs to expand vaccine production and hold corporations accountable, G7 countries and the EU have sought to make a series of vaccine donations – handing left-overs to LMICs after even low-risk populations in their own countries have had an opportunity to be vaccinated. Such pledges often seem to be the favoured approach of rich countries to insulate themselves from criticism for purchasing most global supplies as well as not: (1) rapidly agreeing to waive intellectual property rights, (2) insisting companies share the vaccine technology and (3) making investments to diversify production. Overall, 1.8 billion doses[93] have been promised as donations by the G7 and 'Team Europe'.[3]

Starved of timely delivery of doses by companies with which it had signed agreements, COVAX, even before announcing that it would cut its forecasted procurement of doses by 25 percent this year, had already come to rely on vaccine donations provided by so-called donor governments,[94] which have been announced intermittently over the last year.

The most important pledge prior to a September White House summit was an announcement by the G7, at its Leaders' Summit in June 2021, to provide 870 million vaccine doses[95], of which at least half would be provided by the end of 2021. Since then, alongside several one-off announcements, the Biden Administration sponsored summit at the UN General Assembly in September produced a new set of pledges, including a promise to vaccinate 40 percent of the world's population by the end of the year and 70 percent of the world's population by the UN General Assembly in September 2022.[96]

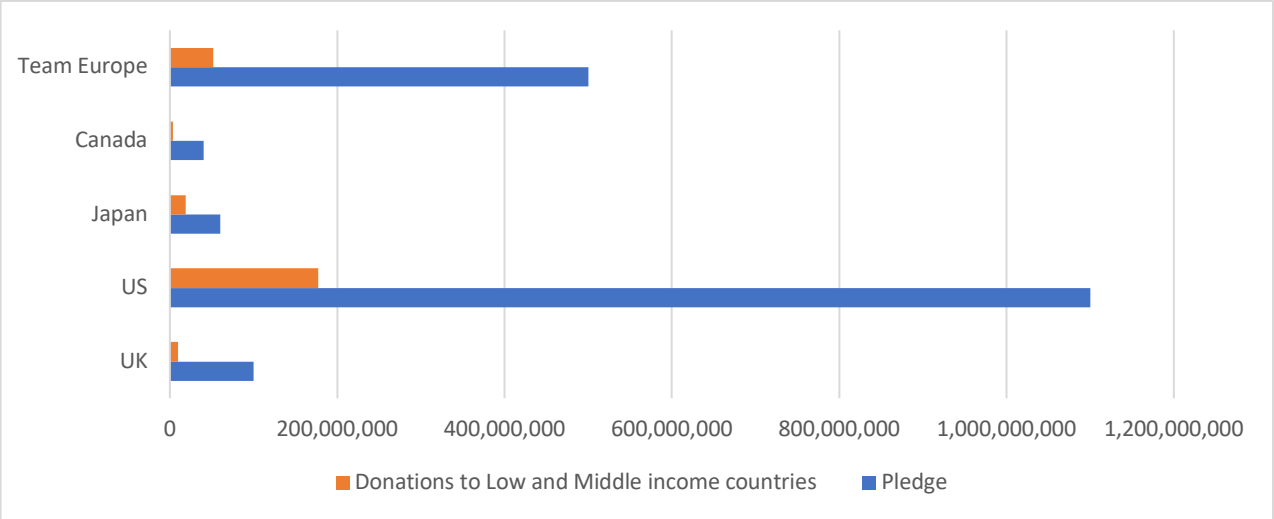
Yet it is not likely that such new pledges can or will be acted upon with any urgency. Of the 1.8 billion doses collectively promised by the G7 and Team Europe, only 261 million doses, or 14 percent have been delivered to low- and middle-income countries. Inexplicably, G7 countries and Team Europe have donated over 10 million doses to high-income countries during the pandemic, or 4 percent of the total donations they have provided during the pandemic. (See Table 6 and Figure 2 below)

Table 6: Actual dose donations by G7 countries and Team Europe (compared to pledged donations)[97]

Country	Total pledge (2021 & 2022)	Donation completion deadline	Donations to all low- and middle-income countries	% of pledge delivered	Donations to high income countries	% of total donations to high income countries
UK	100,000,000	Mid-2022	9,633,260.00	9.6%	12,000	0%
US	1,100,000,000	2022	176,973,180.00	16%	5,982,690	3%
Japan	60,000,000	2021	18,896,950.00	31%	3,964,000	17%
Canada	40,700,000	2021	3,263,350.00	8%	112,030	3%
Team Europe	500,000,000	Mid-2022	52,028,080.00	10%	112030	0%
TOTAL	1,800,700,000		260,794,820.00	14%	10,182,750	4%

[3] Individual pledges from Team Europe countries go towards the 500 million total donation pledges listed in Table 6.

Figure 3: G7 and Team Europe pledged donations (through 2022) versus deliveries to low- and middle-income countries through 12th October 2021



Some governments, such as Canada and the United Kingdom, are not only failing to honour their promises but have also actually taken vaccine doses from COVAX, despite the extreme shortages in LMICs and having already secured more than enough doses through bilateral agreements. In the case of the UK, the government accepted over half a million doses from COVAX in June 2021.[98,99] Just before this in March 2021, the UK also imported millions of doses of the AstraZeneca vaccine manufactured in India[100] - a supply AZ had previously publicly reported was for the specific benefit of low and middle-income countries. The Canadian government acquired 972,000 doses through COVAX.[101,102] Meanwhile, the UK has only delivered on 9.6 percent of its pledged donations to LMICs, and Canada even less at 8 percent.[103]

Beyond the unwillingness to provide donated doses in a timely fashion, another reason for the lack of vaccine donations to LMICs has been poor planning and distribution by high-income countries, such as difficulties with rollout of the U.S. donation program.[104] Another reason is the continued insistence of drug corporations to be indemnified from liability for any claims arising from use of the vaccines. Drug corporations, throughout the pandemic, have sought to delay the provision of doses to countries in dire need of vaccines unless they were fully indemnified for any liability, including even after full regulatory approval by a stringent regulatory authority.[105] This has not only delayed provision of doses through donations, but has led some countries to turn down needed donations, including when India turned down seven million doses of the Moderna vaccine at the height of the Delta variant outbreak in the country earlier in 2021.[106] The persistence of pharmaceutical corporations demanding indemnification from those who provide a vaccine means that a 'humanitarian buffer'[107] that COVAX intends to establish to provide vaccines to refugees, internally displaced persons, and those suffering in humanitarian emergencies worldwide, cannot be successfully launched. The corporations' demand for an indemnity would require charitable humanitarian organisations[108], such as Medecins Sans Frontieres, to indemnify multibillion dollar pharmaceutical corporations.

The delays in donating doses are wasteful and unnecessary – already rich countries are expected to have 1.2 billion excess doses by the end of 2021, even if these same wealthy countries offer third doses to all adults.[109] These delays may have also led to significantly higher numbers of deaths in LMICs. Women suffer disproportionately, partly due to a growing gender gap for vaccination in some LMICs.[110] According to updated estimates published by the Economist, there have been approximately 15.7 million excess deaths worldwide since the start of the pandemic (the number of

excess deaths due to COVID-19 is the gap between how many people died during a given time, regardless of cause, and how many deaths would have been expected if the COVID-19 pandemic had not occurred).[111] Asia and Africa have suffered the largest percentage increase in excess deaths, with Asia experiencing a 700 percent increase in deaths, and Africa suffering through an 800 percent increase.[112]

VACCINE APARTHEID'S ARCHITECTS – CORPORATIONS AND WEALTHY COUNTRIES - ARE EQUALLY TO BLAME

'Global vaccination is not philanthropy; it is self-interest. The larger the pool of unvaccinated people, the more the virus will keep circulating and evolving into new variants – and the greater the economic and social disruption.'

Antonio Guterres, United Nations Secretary General, White House COVID-19 Summit, 22nd September 2021[113]

A recent announcement by IFPMA of global capacity to produce 1.5 billion doses per month was accompanied by a call on wealthy countries to do a better job of redistributing the doses they hoard.[114] While rich countries should share doses, drug corporations do not get to wash their hands of their responsibility for creating the current state of vaccine apartheid. These corporations have had the opportunity since the start of the pandemic to share vaccine recipes, to agree to a waiver of intellectual property rights, to charge affordable prices, and to allocate doses for sales more equitably and immediately to low- and middle-income countries and COVAX, even if both LMICs and COVAX might pay a lower price. Simply selling doses to high income countries to maximise profits and then requesting these countries to share doses is a cynical effort to pass the buck and evade responsibility, and yet also befitting of an industry that consistently ranks near the bottom with respect to its public reputation.[115]

Rich countries must do better – not only by sharing doses – but by prioritising policies that uphold human rights, protect all of us and end the pandemic, instead of protecting the obscene wealth of drug industry shareholders and executives. People around the world are losing out, including taxpayers in wealthy countries, who paid for the development and manufacturing of vaccines to end the pandemic, and not to add to the bottom line of drug corporations. Wealthy countries do not protect their own populations when they hoard doses. If anyone is at risk of COVID-19, we all remain at risk.

And while the White House sponsored summit in September 2021 was intended to signal a new approach to vaccine equity, the reality on the ground tells a different story. Instead of gearing up to close the gap between rich and poor countries, pharmaceutical corporations have been steadily beating the drum to encourage vaccine hoarding countries to acquire so-called booster doses, or third and even fourth doses of COVID-19 vaccines, often at higher prices.[116] An increasingly large number of countries have readily complied with drug industry rhetoric to purchase and deploy booster doses, despite the vigorous disapproval of the WHO.[117]

As of the 12th of October 2021, the United States has already administered 8.55 million booster doses, while the European Union has administered 5.06 million doses.[118] If early adopters of booster doses such as Israel are setting a precedent, there could be a serious strain upon supply. Israel, a country of just 9 million people, has already administered nearly 4 million booster doses.[119] At least two dozen countries have confirmed that they will start to administer third doses, despite insufficient scientific evidence in support of boosters for the general population.[120] A recently published scientific review indicates that, except for people with weak immune systems, the advantage of booster doses do not outweigh the benefit of using those doses to protect billions of people unvaccinated worldwide.[121]

Yet pharmaceutical corporations are on a war footing to both encourage the use of booster doses by rich countries and to compete with other companies to market such booster doses. Pfizer, for example, has been ramping up its efforts to market booster doses in wealthy countries.[122] Given prior company projections that it could charge up to $175 per dose[123] for such third doses, it is not surprising that Pfizer and other corporations could prioritise supply of such third doses before the

unvaccinated millions in LMICs get access to their first dose. Indeed, since the Biden Administration announced its booster plan in mid-August, the average estimate amongst financial analysts of Moderna's 2022 revenue forecast jumped 35%, with an expectation of $13 billion in profit from its COVID-19 vaccine sales next year[124] (although Moderna's revenue projections have been reduced based on recent news of an effective antiviral medicine that could both reduce hospitalisation and deaths due to COVID-19).[125]

With insufficient supplies available worldwide, the decision of pharmaceutical corporations to push out third doses, and for wealthier countries to acquire such doses, means that many unvaccinated people in LMICs will remain without a first dose. Wider use of boosters in wealthy countries is gaining momentum. In early October 2021, the European Medicines Agency approved the use of booster doses from Pfizer/BioNTech for any European over the age of 18,[126] which top officials at the U.S. Food and Drug Administration also appear to support.[127]

The use of booster doses may mean that G7 governments and the EU never fully meet the lofty pledges they have announced earlier this year. The vaccine divide that has emerged over the last year may never be bridged between rich and poor countries.[128] According to news reports, the United States is taking an aggressive and broad approach to its booster rollout out of fears it could run short of doses for its entire population if the protection offered by the vaccines decreased suddenly.[129] Thus, only 300 million doses of the 1.1 billion doses (manufactured by Pfizer) pledged by the United States to the unvaccinated billions in LMICs are expected to be shipped this year.[130]

Yet instead of taking steps to dramatically expand supply for all countries, the Biden Administration has chosen to continue treading the same path and playing into the hands of profit-maximising pharmaceutical corporations. Recent experience shows that standing up new manufacturing facilities, in the United States, Europe, or in LMICs, does not require years of planning. BioNTech, for example, took just four and a half months to repurpose a new plant it had purchased (that had previously not been manufacturing vaccines) to the point it was able to mass produce its COVID-19 vaccine.[131]

CONCLUSION

The People's Vaccine Alliance calls for urgent and bold actions to make good on previous promises, and urgently address today's vaccine apartheid. The pledges made by rich countries and pharmaceutical corporations must be honoured immediately and not at some vague future date. As increasingly transmissible and lethal variants circulate globally, the millions of unvaccinated individuals in LMICs risk ever-higher rates of sickness and death. Many of the doses that have been ordered by wealthy countries exceed need – 241 million doses of vaccines could be wasted by G7 countries just in the next ten weeks. Ramping up delivery of doses must be done rapidly and with transparency, advanced warning and planning to avoid needless waste. Focusing on third shots for domestic populations when so many across the world don't have access to a first shot is not only morally wrong, but also self-defeating. Beyond the human cost it imposes, the scarcity of vaccines in LMICs continues to put even vaccinated people at risk in rich countries.

But charity does not and cannot match the challenge that COVID-19 presents. To truly get the upper hand on the pandemic, LMIC governments have demanded a waiver of intellectual property rules, technology transfer, decentralised manufacturing, and affordable vaccines they can make and buy.

A waiver of intellectual property rules, presented to the WTO by the governments of India and South Africa one year ago, and with near universal support from LMICs today, has not moved forward in part because countries either want to support meaningless alternatives, such as the EU, or because countries that have at least nominally supported the waiver, such as the United States, have not followed through at the WTO or bilaterally with recalcitrant governments. This must change.

Promised manufacturing targets are not likely to be met, and companies are dragging their feet with respect to partnerships in LMICs. It is also unclear if the companies are truly committed to these purported goals or if these are just more promises that will not be kept. And while companies may claim that production is difficult in LMICs, it is their current production in HICs that is causing problems. Earlier difficulties at a key third party manufacturer in the United States for Johnson and Johnson and AstraZeneca (where cross-contamination occurred) led to millions of doses being thrown away.[132] More recently, the Japanese government announced contamination in Moderna vaccines supplied to the country, leading to the disposal of over 1.5 million doses.[133] Instead of brandishing targets that cannot be met to prevent wider manufacturing and sharing of technologies, these companies should partner with the WHO to diversify and expand production with new manufacturers worldwide.

Upcoming meetings, including at the G20 and the World Trade Organization, should include ever-greater commitments to share doses immediately and globally to save as many lives as possible. But for those governments that have been promised so much and received so little, it is also time and opportunity to stop relying on charity, and to start demanding fairness and justice.

The People's Vaccine Alliance calls on world leaders to:

1. Suspend IP rights by agreeing to the proposed waiver of the WTO TRIPS Agreement
2. Demand, and use all legal and policy tools to require pharmaceutical corporations to share COVID-19 data, know-how, and technology with the COVID-19 Technology Access Pool and WHO-South Africa mRNA Technology Transfer Hub without restrictions.
3. Invest in decentralised manufacturing hubs worldwide to move from a world of vaccine scarcity to one of vaccine sufficiency in which LMICs have direct control over sufficient production capacity to meet their needs.
4. Immediately redistribute vaccines equitably with all countries to achieve the WHO target of vaccinating 40 percent of people in all countries by the end of 2021 and 70% of all people by mid-2022.

Methodology and additional information

Unless otherwise stated, data on vaccine purchase and delivery is accurate as of 12th October 2021 and was sourced from the Airfinity database and analysed by the People's Vaccine Alliance.

The data was shared with companies mentioned in this report and they were given the opportunity to comment.

Further breakdown of the figures in this report are set out below.

1. Total deliveries of all vaccines by country income group

To avoid double counting, where countries have donated vaccines onwards, delivery is attributed to the final recipient (donees) rather than primary recipient (donor)

Source: Airfinity, as of 12th October 2021

Income group	Total delivery	% distribution
High-income	1,858,011,758	24.8%
Low-income	52,194,650	0.7%
Lower-middle-income	2,013,396,488	26.9%
Upper-middle-income	3,571,776,919	47.7%
Total	**7,495,379,815**	

2. Total deliveries of AstraZeneca, J&J, Moderna, and Pfizer/BioNTech by income group

To avoid double counting, where countries have donated vaccines onwards, delivery is attributed to the final recipient (donees) rather than primary recipient (donor)

Source: Airfinity, as of 12th October 2021

	Deliveries by income group	% of delivery by income group
Ad26COVS1 (J&J)		
High-income	49,135,611	50.5%
Low-income	12,228,850	12.6%
Lower-middle-income	17,040,250	17.5%
Upper-middle-income	18,977,850	19.5%
Total	**97,382,561**	
AZD1222 (University of Oxford/AstraZeneca)		
High-income	222,257,799	13.8%
Low-income	20,083,980	1.2%
Lower-middle-income	1,118,851,620	69.5%
Upper-middle-income	247,735,260	15.4%
Total	**1,608,928,659**	
BNT162b2 (Pfizer/BioNTech)		
High-income	1,180,070,199	74.4%
Low-income	5,692,820	0.4%
Lower-middle-income	87,687,660	5.5%
Upper-middle-income	311,612,069	19.7%
Total	**1,585,062,748**	
mRNA-1273 (Moderna)		
High-income	359,331,330	82.3%
Low-income	897,400	0.2%
Lower-middle-income	55,128,520	12.6%
Upper-middle-income	21,104,080	4.8%
Total	**436,461,330**	

3. AstraZeneca, J&J, Moderna, and Pfizer/BioNTech combined delivery, by income group and populations

Income band	Total vaccines	% of delivery by income group	Population	% share of total population
High-income	1,810,794,939	48.6%	1,203,084,538.00	16%
Low-income	38,903,050	1.0%	619,288,000.00	8%
Lower-middle-income	1,278,708,050	34.3%	3,238,473,725.00	43%
Upper-middle-income	599,429,259	16.1%	2,516,997,851.00	33%
TOTAL	3,727,835,298		7,577,844,114.00	

4. Bi-lateral and EU sales.

EU treated as high income. Confirmed sales only.

	Total supply of COVID-19 vaccine doses.	% of bilateral & EU sales
Ad26COVS1 (J&J)		
High-income	482,150,000	87%
Lower-middle-income	15,000,000	3%
Upper-middle-income	58,300,000	10%
Total	**555,450,000**	
AZD1222 (Oxford/AstraZeneca)		
High-income	975,700,000	33%
Lower-middle-income	1,488,400,000	50%
Upper-middle-income	525,870,000	18%
Total	**2,989,970,000**	
BNT162b2 (Pfizer/BioNTech)		
High-income	1,747,000,000	67%
Lower-middle-income	219,850,000	8%
Upper-middle-income	647,000,000	25%
Total	**2,613,850,000**	
mRNA-1273 (Moderna)		
High-income	907,700,000	94%
Lower-middle-income	25,200,000	3%
Upper-middle-income	35,500,000	4%
Total	**968,400,000**	

5. Additional data on country donations

Breakdown of Team Europe pledges and donations

Country	Delivered	Promised	% delivered
Austria	2,155,000	1,000,000	216%
Belgium	948,500	4,000,000	24%
Bulgaria	543,980		
Croatia	180,000		
Czech Republic	250,800	2,390,000	10%
Denmark	1,513,420	6,000,000	25%
Estonia	52,800	900,000	6%
France	10,704,080	120,000,000	9%
Germany	12,394,960	100,000,000	12%
Greece	1,340,000		
Hungary	700,000		
Iceland	35,700		
Ireland	335,500	1,300,000	26%
Italy	6,108,800	45,000,000	14%
Latvia	80,400		
Lithuania	196,500		
Luxembourg	56,000	350,000	16%
Malta	40,000		
Netherlands	1,425,000		
Norway	674,020	5,000,000	13%
Poland	1,768,200		
Portugal	663,000	4,000,000	17%
Romania	1,428,200		
Slovakia	550,000		
Slovenia	448,000		
Spain	6,200,980	30,000,000	21%
Sweden	1,234,240	6,000,000	21%

Individual pledges and donations from Team Europe countries go towards the 500 million total

Row Labels	Total donations delivered	Pledge	When	% delivered
Australia	3,473,000	60,000,000	2022	6%
New Zealand	403,600	1,600,000	2021	25%

Further information on donation pledges:

https://www.thinkglobalhealth.org/article/billions-committed-millions-delivered

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