

PANDEMIC OF GREED

A wake-up call for vaccine equity at a grim milestone

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Summary

The human and economic cost of the COVID-19 pandemic has been staggering, in terms of lives lost, human suffering, and economic damage. As we enter the third year of the pandemic, we still find ourselves on a rollercoaster of lockdowns, variants, and broken promises. Inequality has actively prolonged the pandemic, devastating lives and livelihoods. Women have shouldered an especially heavy burden.

While effective vaccines provide hope, their rollout has tipped, from a natural desire to protect citizens, into nationalism, greed, and self-interest. Large numbers of people in low-income countries face the virus unprotected and millions of people would still be alive today if they had had access to a vaccine. Big pharmaceutical corporations have been given free rein to prioritize profits ahead of vaccine equality. As we mark two years since the official pandemic was declared, we still have a chance to gain the upper hand on the virus, but only if everyone, everywhere has access to vaccines and treatments.

1. THE COST OF THE PANDEMIC

Two years ago, the World Health Organization (WHO) declared COVID-19 a global pandemic¹. This month, we could have been celebrating the end of the pandemic in every country. Yet, we find ourselves on a rollercoaster of variants, illness, deaths, and lockdowns instead.

It is just over a year since COVID-19 vaccination programs first began: a miraculous moment that offered hope that humanity could be liberated from this deadly disease. In creating safe and effective vaccines, scientists did their job, but corporate and world leaders locked this miracle of science behind a wall of profit and monopoly. Despite the current optimism, this pandemic is still very far from over.

The official death toll stands at 5.9 million² people, which is widely agreed to be a huge underestimate, especially for developing countries where adequate testing is not possible.

Modelling using measures of excess deaths³ shows that an estimated 19.6 million people have lost their lives because of the COVID-19 pandemic – 3.3 times more than officially recorded.⁴ That's approximately 18 people every minute.⁵ A population roughly equivalent to a city the size of Beijing, Mumbai or Dhaka⁶ have likely died as a result of the pandemic.

Official records paint the picture that most deaths have been in wealthy countries, but in fact, the majority of deaths have been in developing countries:

- **For every life lost in a rich country another four people have died in a poorer nation**, 54% of all deaths caused by COVID-19 have been in low and lower middle-income countries, where 10.6 million people have died. 2.7 million people are estimated to have died in high income countries, 14% of global deaths.⁷
- **People in poorer nations are 1.3 times more likely to die as a result of the pandemic compared to rich countries.** Per capita deaths in low and lower middle-income countries are 31% higher than high income countries.
- **Every minute, four children around the world lose a parent or caregiver as a result of the pandemic** – almost half of these children are in India, where over two million children have been affected by orphanhood.⁸
- **The pandemic is far from over. More than three million people (3.2m) have died since Omicron was detected** and it continues to spread. 16% of estimated excess deaths have been since the beginning of the Omicron wave.⁹

There is a clear trend that within countries, the poorest people and those from minority ethnic groups are more likely to bear the brunt of pandemic deaths. In some countries, the poorest people are nearly four times more likely to die from COVID-19 than the richest. In Brazil, Black people are 1.5 times more likely to die from COVID-19 than White people. In the USA, Native American, Latinx, and Black people are two to three times more likely than White people to die from COVID-19.¹⁰

The pandemic has wreaked havoc on global economies and household incomes. An estimated 99 percent of humanity are worse off because of COVID-19, 160 million people have been pushed into poverty¹¹ and 137 million people have lost their jobs¹². Women have felt an especially heavy burden during the pandemic.

The human and economic cost of this greed has been staggering. For most.

The richest 10 men doubled their fortunes during the pandemic and a new billionaire is being created every 26 hours. Of those new billionaires, 40 of them have made their billions profiting from vaccines, treatments, tests, and PPE.¹³

Worsening gender inequality

Across the globe, spiralling economic and gender inequities deepened the suffering that girls, women, and non-binary people face.

Even before the pandemic, a staggering one in three women experienced physical or sexual violence.¹⁴ The pandemic has made the situation even worse. Economic insecurity due to mass unemployment, directly linked to the pandemic, has increased women's vulnerability to violence in the home. Calls to domestic violence and gender-based violence (GBV) helplines increased and domestic abuse killings tripled during early lockdowns.¹⁵ At the same time, the impact of the pandemic has also deepened long-standing gender inequalities in the economy:

- During 2020, women were 1.4 times more likely to drop out of the labour force¹⁶, and took on three times more hours unpaid care work than men.¹⁷
- In 2021, there were 13 million fewer women in employment compared to 2019, while men's employment recovered to 2019 levels.¹⁸

The pandemic has disproportionately pushed women out of employment, especially as lockdowns and social distancing have affected highly feminized workforces in the service sectors, such as tourism.¹⁹

Social norms have entrenched care work as the responsibility of women and girls who undertake more than three-quarters of unpaid care work²⁰. COVID-19 and lockdowns have increased levels of unpaid care and domestic work at a time when families have fewer resources and even less access to services.²¹

More than 90 percent of women workers in developing countries are employed in the informal sector,²² lacking employment protections and social safety nets such as coronavirus relief payments. With little choice but to continue working, they faced harassment and brutalization by police and military authorities enforcing coronavirus control measures such as checkpoints, quarantines and curfews.²³ Equally, in sectors of the workforce where women are overrepresented, such as the domestic work and healthcare sectors, workers have seen dramatic increases in violence,²⁴ as have migrant women workers, isolated with their employers and unable to reach family and support networks.²⁵

The impacts of the pandemic on women and girls and LGBTQIA+ people are likely to be felt far into the future, through reduced lifetime earnings, lost contributions to pensions, and reduced access to education. Governments, however, have failed to step up with any bold and ambitious policies to address these concerns.

The hope of vaccinations

On the 8 December 2020, 91-year-old Margaret Keenan became the first person in the world to get a COVID-19 jab as part of a part of a mass-vaccination programme.²⁶ This gave the world hope – a way out of the pandemic. World leaders united to commit to global vaccine equity. 'No-one is safe until everyone is safe' became the mantra.

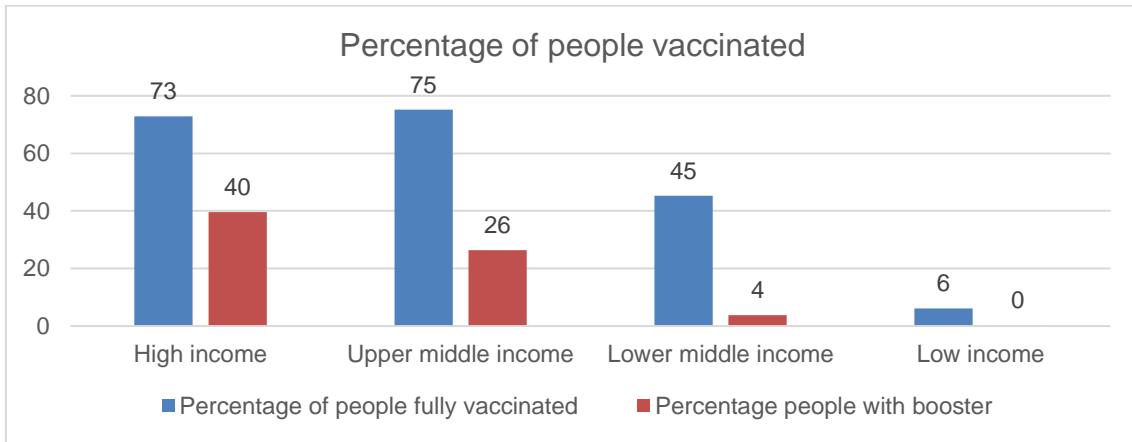
Since that first vaccine, 10.6 billion doses have been administered²⁷. If global leaders had kept their promises, then every adult in the world who wanted it could be fully vaccinated.

Instead, vaccine rollouts have tipped from a natural desire to protect citizens into nationalism, greed, and self-interest resulting in huge numbers of people still facing the virus unprotected.

Seventy-three percent of people in high income countries are fully vaccinated while just six percent of people in low-income are.²⁸ Wealthy countries have raced ahead with boosters, while many countries are struggling to get hold of enough doses to vaccinate their health professionals and vulnerable populations:

- High income countries have given six times more booster vaccines than low income countries have given first doses²⁹.
- Between November 2021 and March 2022 an estimated 241 million doses have been disposed of by G7 countries³⁰ because they were hoarded and allowed to expire.

Chart 1: Percentage of people vaccinated by World Bank income group³¹

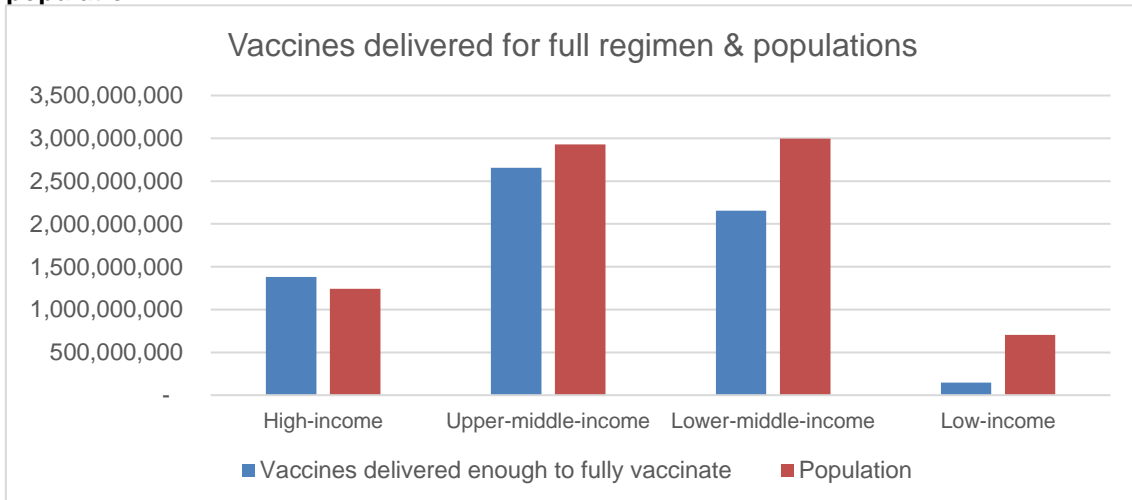


COVAX, the initiative that is currently the only global mechanism to ensure equitable access for poorer countries to COVID-19 vaccines has failed to deliver. By the end of 2021, the scheme had delivered less than half of the doses it had originally promised, and over a third of these deliveries were in the last month of the year.³² COVAX failed to challenge the pharmaceutical monopolies restricting vaccine supply and inflating vaccine prices. Its governance locked out meaningful inclusion and representation of both developing country governments and civil society.³³

Under-funded and left to compete with unbridled pharmaceutical greed and vaccine nationalism by wealthy countries, COVAX has been pushed to the back of the vaccine queue, leaving it dependent on donations of doses for around half of the vaccines it has delivered to date. COVAX has now run out of cash so that it can no longer even pay for syringes needed to deliver any further doses. Practically speaking, the one mechanism to ensure equitable access to COVID-19 vaccines has run dry.

Millions of people would still be alive today if they had been vaccinated - but they were denied a vaccine while big pharmaceutical corporations continued to prioritize profits and hold monopoly control of these technologies. As table 2 shows, only high-income countries have received enough doses to fully vaccinate their populations. Failure to vaccinate the world is breaking economies and supercharging inequalities worldwide.

Chart 2: All vaccines delivered (including donations) by World Bank Income group and population³⁴



How we got here: Pharmaceutical greed and government self-interest

This appalling story was entirely avoidable. Rather than solidarity among nations, nationalism and self-interest triumphed. The EU, and the UK and US governments allowed pharmaceutical companies to turn unprecedented public investment in life-saving vaccines into private wealth.

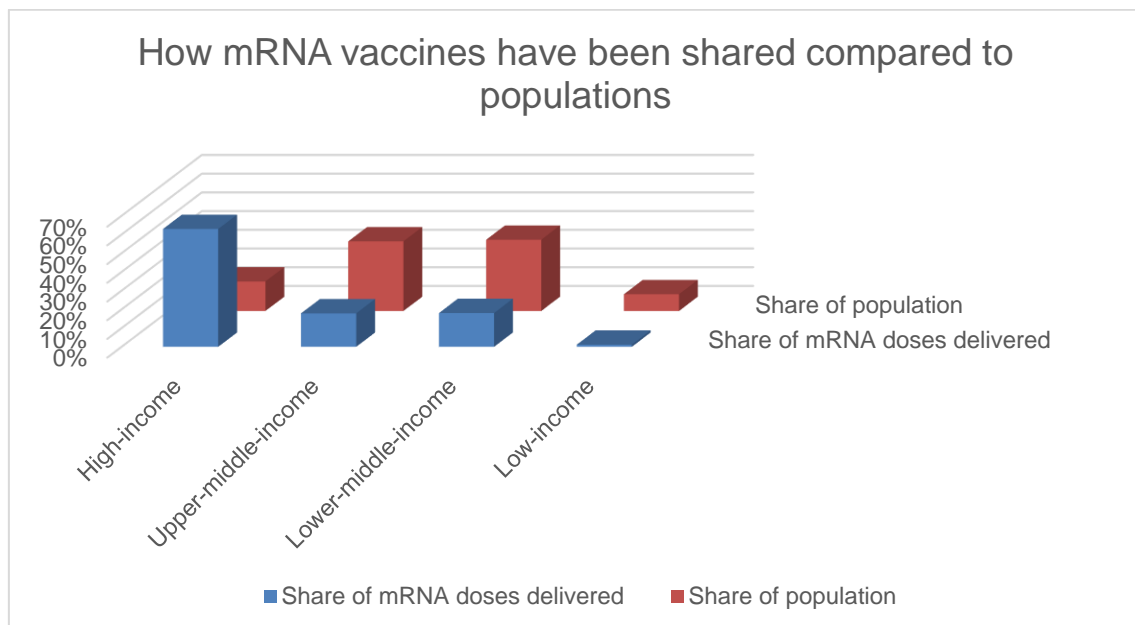
At the beginning of the pandemic, governments ploughed \$100 billion³⁵ into pharmaceutical companies to fast-track the development and manufacturing of COVID-19 vaccines and treatments. Moderna has perhaps been the most successful company at converting this public investment into private wealth. Having received \$10bn in government funding to develop the vaccine, boost manufacturing capacity, run clinical trials, and deliver vaccines³⁶ – it then sold the vaccines back to governments with a huge 66 percent net profit margin³⁷. Scientists estimate that Moderna's vaccine could be replicated for less than \$3 a dose, yet its average price tag is \$21 – some countries, like the UK are paying as much as \$37 a dose³⁸. Colombia is reported to have been charged \$30. Pfizer, BioNTech and Moderna, the most profitable vaccine companies, are together making over \$4 million an hour in pre-tax profit from the vaccines.³⁹

These massive profit margins have been created because these companies were allowed, even encouraged, to invite the countries with the deepest pockets to the front of the vaccine queue.

The problem is especially pronounced among the vaccine producers who are seeking to maximise profits. For example, AstraZeneca, who until recently was selling its vaccine for no profit globally, has delivered almost as many vaccines to low income countries as Moderna and Pfizer/BioNTech combined⁴⁰.

While high-income countries pay between \$15-37 a dose for mRNA vaccines, COVAX (the facility that many lower income countries are reliant on for vaccine procurement) and the African Union pay between \$6.75-10 a dose⁴¹. As chart 3 shows, the majority of mRNA vaccines have been delivered to high income countries who were able to grab the lions' share. For every dose of mRNA vaccine delivered to low-income countries, 56 are delivered to rich countries⁴².

Chart 3: Share of Pfizer/BioNTech and Moderna vaccines delivered (including donations) and populations by World Bank Income group

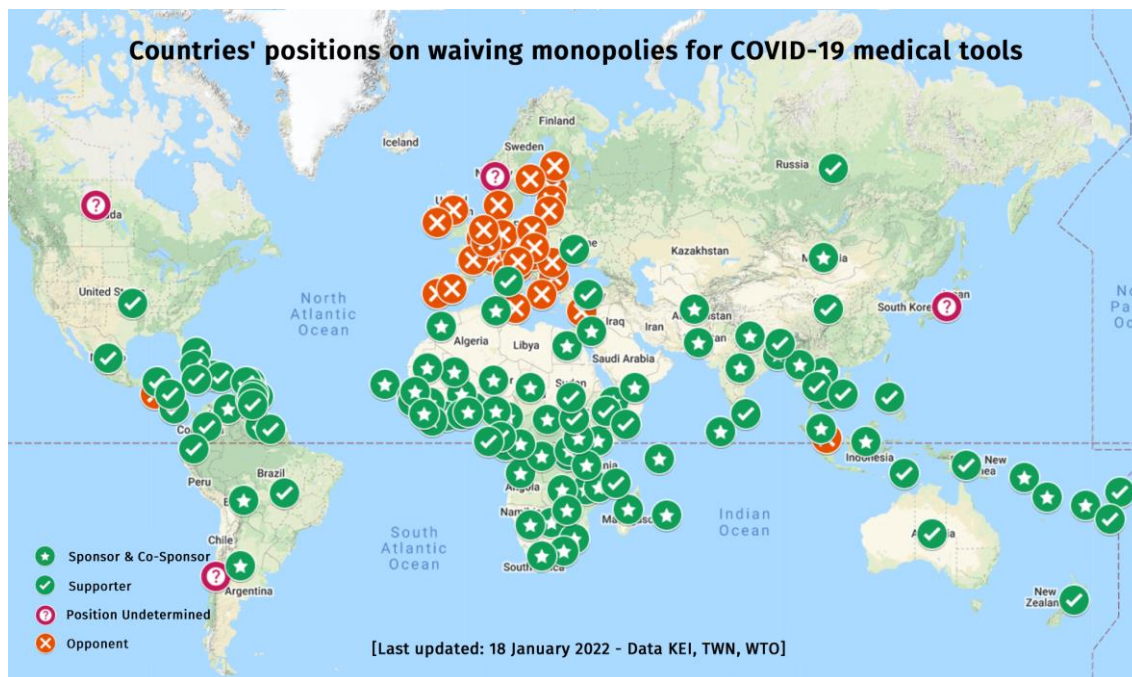


One of the most damning indictments of this behaviour was when the Omicron variant emerged. Despite the variant being first detected in Southern Africa - a region with limited access to vaccines, rich countries were able to force their way to the front of the delivery queue yet again. In just six weeks, more doses of COVID-19 vaccines were delivered to the EU, the UK, and the United States than African countries had received all year.⁴³

The way out of the pandemic

A proposal to ensure vaccine equity was tabled in October 2020 by India and South Africa at the World Trade Organisation (WTO). Their proposal was to waive patents and certain other intellectual property protections associated with vaccines, treatments, and tests and other COVID-19 technologies so that countries could manufacture or obtain access to lower-cost life-saving medical tools.

The proposal is supported by 110 countries, home to 79% of the world's populations⁴⁴. Since the waiver proposal was first tabled, 16 million people are estimated to have died⁴⁵.



Source: Médecins Sans Frontières

Before proposals for the waiver, the World Health Organisation set up a facility - Coronavirus Treatment Acceleration Program (CTAP) - that would allow drug companies to share their technology with other competent manufacturers. The WHO also established technology transfer mRNA hubs to rapidly scale up vaccine manufacturing sites in low- and middle-income countries.

Over one hundred factories that could be producing life-saving mRNA vaccines around the world have been identified.⁴⁶

These initiatives have the potential to improve access to medicines in developing countries - taking the power and control to decide who gets lifesaving treatment away from a handful of corporations and into the hands of the people. Ensuring that everyone had access to mRNA vaccines could save 1.5 million lives.⁴⁷

There is one problem. Proposals to waive these intellectual property protections and share the vaccine technology as a global public good would hit the bottom line of pharmaceutical companies.

The companies producing vaccines were vehemently opposed because these vaccines were the most profitable pharmaceutical products in history⁴⁸. Removing their monopoly, and ability to dictate market prices, would inevitably see vaccine prices plummet and the billions in guaranteed revenue eroded.

It's no wonder why more than 100 drug lobbyists were dispatched to Washington⁴⁹ and €36 million spent in Brussels to fight against the proposed waiver.⁵⁰

The EU nations and the UK are among the few countries who are blocking the intellectual property waiver proposal from moving forward. While President Biden has professed support for a waiver for vaccines, his administration has not played an active role at the WTO negotiating

table - and as a result, the negotiations have dragged on, unresolved, while millions of people around the world needlessly fall ill.

The countries who are blocking the TRIPs Waiver are driven by national greed.

Consider that half of all high value mRNA vaccines are manufactured in Germany alone (USA, Switzerland and Spain produce the other half)⁵¹. BioNTech alone represents 0.5% of Germany's GDP⁵² and brought in €3.2 billion in tax revenue for the country on 2021 (more than the EU has contributed to COVAX)⁵³.

Transferring vaccine technology could potentially cost billions in tax revenue and risks the ire of the manufacturers who control countries' place in the vaccine queue. It has been reported that in South Africa "Pfizer and Johnson & Johnson pressed officials to drop the country's waiver campaign during months of talks over terms of a supply contract".⁵⁴ The consumer advocacy group, Public Citizen revealed that Pfizer contracts with countries include clauses that allow the company to silence critics, demand state assets as collateral and control delivery dates.⁵⁵

Where we're going: A fork in the road

At the current rate, it will take another two and a half years for low-income countries to be able to vaccinate 70% of their populations with an initial two doses⁵⁶.

As boosters, the mRNA vaccines are currently considered to be the most effective vaccines at reducing infection of Omicron, but experts have estimated a 15 billion dose gap between how many mRNA COVID-19 vaccines in 2022 corporations will produce in 2022, and what is needed.⁵⁷

As we enter the third pandemic year, we find ourselves at a fork in the road.

The path of greed and self-interest by rich nations and pharmaceutical corporations takes us into an endless vortex of variants, lockdowns, and firefighting with boosters for those who can afford them. Or the path of co-operation and solidarity, which is the route out of the pandemic for all, where the monopolies for vaccines and treatments are ended and made available as a common good for all.

The path leading out of the pandemic is, in part, being blocked by myths, often perpetuated by those whose self-interest is served by retaining vaccine monopolies. In Section 2, we address some of these myths.

2: DANGEROUS MYTHS

Myth 1: The pandemic is over; we can live with this coronavirus.

Reality: Vaccine inequality leaves billions of people still at risk of severe illness and death.

*"As long as we refuse to vaccinate the world, we will continue to see new waves... We are going to continue to have pretty dangerous variants coming out of low- and middle-income countries. That's where the battleground is."*⁵⁸ Professor Peter Hotez

Omicron has been described as the beginning of the end of the pandemic by many commentators, especially in the heavily vaccinated rich world. This has led to what Gordon Brown has described as a 'unjustified COVID-19 complacency' in richer nations.⁵⁹

Omicron is certainly, for the most part, a milder variant of COVID-19, and at the same time far more transmissible than previous variants.⁶⁰

While their effectiveness in preventing transmission of the disease has been much reduced by Omicron, the good news is that COVID-19 vaccines are continuing to significantly prevent cases of severe disease, hospitalisation, and death, especially when a booster dose is administered.

Omicron impacts have mostly been studied in countries with high vaccination rates, which does not accurately reflect the global situation.

In the United States, where vaccination rates are lower than in Europe, the deaths from COVID-19 have remained high, on a par with previous waves of the pandemic.⁶¹

By some estimates,⁶² over half of humanity is likely to get COVID-19 during the Omicron wave, meaning that although milder, the overall number of hospitalisations and deaths is likely to remain high.

One in three people in the world - three billion people - have yet to receive their first vaccine dose for COVID-19. In low income countries just 6% of people are fully vaccinated and only 16% of the world has had a booster jab.⁶³

According to the excess death figures from *The Economist*, 3.2 million people are estimated to have died in the period since Omicron was detected – 16% of all total deaths since the start of the pandemic. 1.8 million of those in low and lower middle-income countries.⁶⁴

While the virus remains widespread, and with low levels of vaccination in large parts of the world, new variants are inevitable. Contrary to many assumptions and humanity's wish, there is no reassuring epidemiological evidence to suggest that the virus is on a one-way trajectory towards milder and milder versions. Future variants could be more dangerous. The pandemic is not over, and claims that we can 'learn to live with this virus' are both premature and an insult to the billions of people across the world without fair access to the vaccines and other medical technologies they need to protect themselves and their loved ones.

Myth 2: Most COVID deaths have been in rich countries

Reality: Official statistics massively underestimate the death tolls in poorer nations.

The belief that rich countries have been most affected by the pandemic is a result of two things – firstly, global news is dominated by Western media companies and coverage inevitably focuses on the impacts in countries where these companies are based.

Secondly, official statistics do not capture the full extent of COVID-19 deaths. This is especially acute in countries where health systems are weak and data collection is not as robust. Scientists have attempted to estimate the global death toll from the pandemic by calculating the excess deaths - the number of deaths that have occurred compared to what would have been expected.

One of the most robust calculations has been by *The Economist* which estimates 19.5m global excess deaths, 3.3 times the 5.9 million official number of COVID-19 deaths.

Official statistics point to 38 percent of COVID-19 deaths occurring in high income countries, whereas the estimates for excess deaths put the figure at 14 percent (see chart 5). The perception of disproportionately high death rates in high income countries may have been a justification by some for these countries buying up the majority of the world's vaccines, and administering boosters, before most people in other countries had received their first shot.

Despite widely held perceptions that lower income countries, with younger populations, have not suffered the same horrific death tolls as rich countries, estimates of excess deaths say otherwise. This is especially stark in lower middle- and low-income countries – official statistics place 18% of global deaths occurring in these countries, while the *Economist* estimation puts this figure at 54% (see chart 4). This suggests that for every single tragic life lost to COVID in a rich country, four lives were lost in low and lower-middle income countries.

On a per capita basis, deaths in low and lower middle-income countries are 31% higher than in high income countries. Thirty two percent of all global deaths have been in upper-middle income countries.

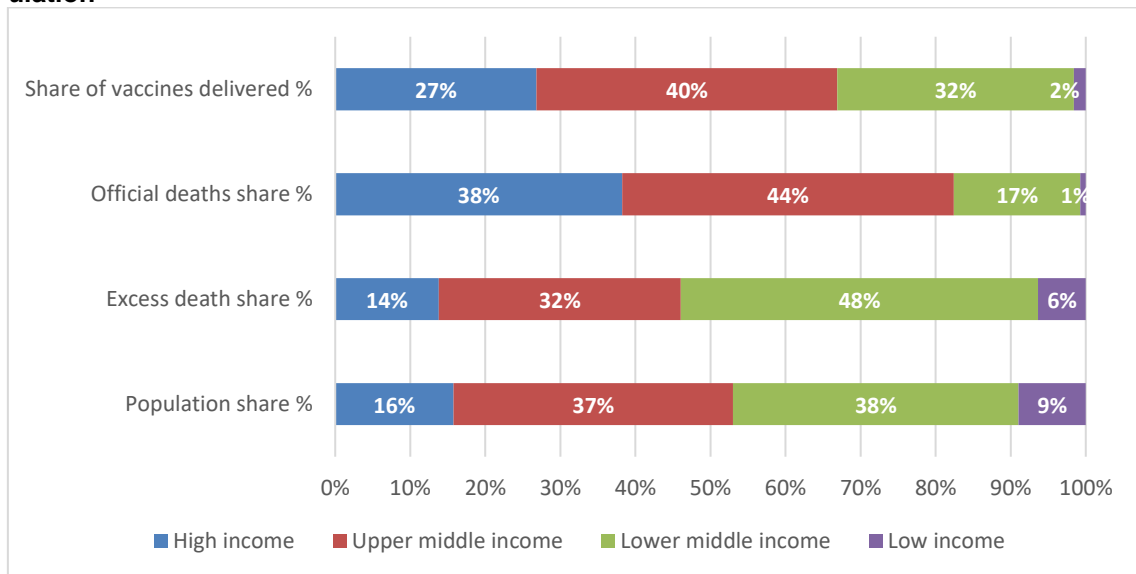
The true scale of the COVID tragedy in low- and middle-income countries has been keenly felt by those working in and those turned away from under-resourced and overwhelmed health facilities; by those left to their own devices desperately searching for oxygen to ease the suffering of their loved ones when the hospital supplies run dry; and by those responsible for digging mass burial sites in countries from Brazil to Indonesia.

Chart 4: Estimated excess deaths vs officially recorded deaths⁶⁵.



The Y axis is number of deaths, X axis is date from 1st January 2020 to 20th February 2022.

Chart 5: Global share of vaccine deliveries, official and estimate excess deaths and population



Myth 3: Children are not severely affected by the pandemic.

Reality: There is a hidden pandemic of orphanhood and gender-based violence.

'I do miss her all the time. It's like it happened yesterday though it's been a year.' Limbani Ligo-meka, who lost his mother Doreen to COVID-19 in Malawi in January 2021.

While children are far less likely to die or become severely ill from coronavirus, they have been deeply affected by the pandemic. Firstly, COVID has caused what experts have described as the 'hidden pandemic of orphanhood'⁶⁶. Globally, 4.7 million children have lost a parent or caregiver to COVID-19⁶⁷. That's four children every minute. Almost half these losses were in India where over two million children have been affected by orphanhood.

Lockdowns left 1.6 billion children globally – more than 90% of those enrolled - temporarily out of school,⁶⁸ with severe long-term effects. Not only has this led to increases in child labor and domestic violence, but the World Bank estimates that COVID-19-related school closures and economic shocks risk students losing \$17 trillion in lifetime earnings, 14% of today's global GDP.⁶⁹ These impacts most acutely affect children in low- and middle-income countries.

Adolescent girls have faced increased gender-based violence - being pulled out of school, refused access to sexual and reproductive health information and services, and forced to marry early, which are all risk factors for gender-based violence in the future. Ten million more girls are at risk of becoming child brides by 2030, and with coronavirus disrupting interventions to curb the practice, an additional two million cases of female genital mutilation (FGM) are expected in the same time span.⁷⁰

Myth 4: The problem is not supply, it's vaccine hesitancy.

Reality: The overriding reason for low vaccination rates across the world is lack of access, not hesitancy.

Vaccine hesitancy, in particular in Africa, has been blamed as the "real cause" of why Africa's vaccination rate stands at just thirteen percent⁷¹. Vaccine misinformation and hesitancy is indeed a global problem requiring collective efforts to overcome, but the issue of vaccine acceptance has been massively overstated as an excuse for failing to deliver.

President Biden remarked on a "reluctance" by people in South Africa to get vaccinated and Pfizer CEO Albert Bourla has repeatedly made claims about high levels of vaccine hesitancy in poor countries⁷². This presents a very convenient distraction from the failure to ensure that everyone, everywhere has access to the vaccines.

Various studies in fact point to vaccine willingness being higher in parts of Africa than it is in many developed countries. A World Bank study in six Sub-Saharan African countries found that 80 percent of people would take the vaccine, with rates from near universal acceptance in Ethiopia (97.9%) and high estimated acceptance in Nigeria (86.2%), Uganda (84.5%), Malawi (82.7%) and Burkina Faso (79.5%) to lower acceptance in Mali (64.5%).⁷³ A study published in Nature found that people in low- and middle-income countries have a much higher willingness rate (80%) compared to the United States (64%)⁷⁴. An Africa Centres for Disease Control and Prevention (Africa CDC) survey of 15 African countries found 79 percent of respondents said they would get vaccinated against COVID-19.⁷⁵

As this paper sets out, there is a significant challenge in ensuring enough vaccines are delivered to low- and middle-income countries while no clear evidence, beyond the anecdotal, that hesitancy is a major barrier.

Myth 5: Rich countries can donate their way out of the pandemic.

Reality: Donations have fallen far short of what is needed.

G7 leaders have pledged to donate 1.8 billion vaccine doses but have broken their promises.

Just 48% of those promised doses have been delivered. At the same time, in January 2022, Airfinity estimated that in G7 countries, 241 million doses would expire and be wasted by March 2022.⁷⁶

The agencies responsible for delivering donated vaccines, including COVAX, UNICEF, Africa Centres for Disease Control and Prevention, and the African Vaccine Acquisition Trust, have complained that the majority of donations from rich countries have been ad hoc, provided with

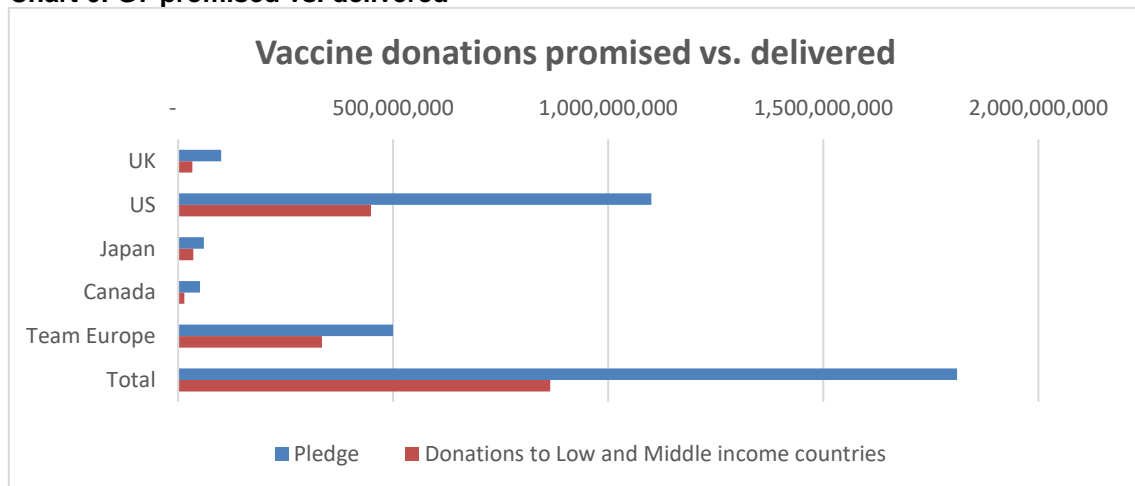
little notice and short shelf lives, and without essential equipment including syringes⁷⁷. The way in which donations are being made increases the risk that doses will be wasted.

Instead of standing up to pharmaceutical corporations and working to increase production by breaking monopolies, rich nations have sought to pacify critics by making grand promises which they have then broken once the cameras were looking the other way.

Table 1: G7 promised doses vs delivered⁷⁸

Country	Pledge	By when	Donations to Low- and Middle-income countries	% of pledge delivered
UK	100,000,000	mid 2022	33,195,190	33%
US	1,100,000,000	2022	448,087,880	41%
Japan	60,000,000	2021	35,032,430	58%
Canada	50,700,000	2021	14,451,970	29%
Team Europe	500,000,000	mid 2022	334,538,310	67%
Total	1,810,700,000		865,305,780	48%

Chart 6: G7 promised vs. delivered



Myth 6: Pharma needs intellectual property protection to incentivize research and development and innovation for this and future pandemics.

Reality: Intellectual property didn't get us the vaccines, billions in public funding did.

Contrary to the confident claims of pharmaceutical corporations and their supporting governments, intellectual property rules in fact dismally failed to drive the innovation necessary to ensure the world was prepared for this pandemic. Despite years of warnings that novel coronaviruses were among the pathogens most likely to cause a global health emergency, coronavirus R&D pipelines remained largely empty right up until the pandemic hit.⁷⁹ Vaccine development scientists have described how they struggled to obtain support for their earlier work against betacoronaviruses.⁸⁰ Even today, 10 of the 15 other pathogens most likely to cause the next pandemic have empty R&D pipelines, and investment in the other five is alarmingly low.⁸¹ Intellectual property rules are doing nothing to plug this gap.

The rapid development of the COVID-19 vaccines instead relied on the application of existing vaccine technologies largely paid for by government funding over the decades prior to the pandemic, including \$17.2 billion from the US government alone between 2000 and 2019.⁸² Once the pandemic hit, governments knew what they needed and they paid research institutions and pharmaceutical companies to deliver - rapidly spending over \$100 billion on further vaccine development, manufacturing and advance purchases within the first months of the pandemic.⁸³

Huge public subsidies and unprecedented advanced payments, together with expected enormous demand, removed risks and provided the incentive necessary for companies to deliver.

Instead of driving the development of Covid-19 vaccine science, intellectual property has been used by pharmaceutical corporations to privatise and monopolize it, transforming public subsidy into private wealth while denying millions of people access to the doses. A prime example is Moderna, a company that has successfully converted the \$10bn it received in government funding (including vaccine pre-orders)⁸⁴ to around \$12bn to date in vaccine profits⁸⁵. The company has created four new vaccine billionaires⁸⁶ while just 1% of its total vaccine supply has gone to the poorest countries⁸⁷.

Pfizer made a big deal that they shunned any public funding but in truth they received nearly \$2 billion in guaranteed pre-orders from the US government, and their partner, BioNTech, received €375m (\$445m) from the German Government to accelerate vaccine development, along with another €100m (\$117) in financing from the European Investment Bank. Along with Moderna, Pfizer and BioNTech also benefited from decades of publicly funded research into mRNA.⁸⁸

Moderna's 2021 net profit margin is 66 percent (pre-tax profit margin is 72%)⁸⁹. Oxfam calculates a conservative pre-tax profit margin of the Pfizer/BioNTech vaccine as 43%.⁹⁰ These profits are extreme - to put them into perspective the average pre-tax profit margin of the 500 largest US companies in 2021 was around fifteen percent⁹¹. Pfizer, BioNTech, and Moderna are making \$4 million an hour in vaccine pre-tax profit⁹². These companies are likely to pay large proportions of their profits to shareholders – in 2021 Pfizer paid \$8.7bn in dividends⁹³.

Intellectual property has safeguarded and delivered obscene and unjustifiable levels of profits for a handful of companies at the direct cost of a more widely distributed and scaled up vaccine manufacturing effort that could have forced down vaccine prices and most importantly saved more lives. More than that, in this global public health crisis, intellectual property protections have acted as a brake on urgently needed collaboration and cooperation in science that could have generated more rapid innovation by enabling scientists to build on each other's successes and failures to advance ever more effective, stable, cheaper, longer-lasting and more appropriate vaccines and other COVID-19 technologies to meet global and local need.

Alternative approaches are possible. Vaccines have been developed recently that have required neither the use of intellectual property nor the pursuit of blockbuster profits. A new vaccine developed through a partnership of the Baylor College of Medicines, Texas Children's Hospital, and Biological E, an Indian vaccines company, was developed without any patent protection and will be sold at a low cost of \$2.50 dollars per dose⁹⁴. The vaccine was developed with, just a fraction of the billions of dollars funnelled into multinational drug companies.

Myth 7: Current vaccine manufacturers can produce enough vaccines for the world.

Reality: Even with companies working at full capacity, vaccine monopolies are preventing enough vaccines from being manufactured.

"At the end of the year (2021) we also have to admit we dismally failed in terms of equitable rollout, equitable distribution" Thomas Cueni, director general of the International Federation of Pharmaceutical Manufacturers and Associations (IFPMA)⁹⁵

In October 2021 the industry body the International Federation of Pharmaceutical Manufacturers and Associations announced that by the end of 2021, 12 billion doses would be produced⁹⁶. This figure was used to justify the industry's objection to the proposed TRIPs waiver. There would be enough vaccines produced for everyone, all that is needed is to distribute them across the world they argued.

The science suggests that everyone will need a booster shot to fully protect them against Omicron, ideally with the mRNA vaccines manufactured by Moderna and Pfizer/BioNTech which are among the only vaccines that have clearly been demonstrated to provide significant protection against Omicron infection.⁹⁷

One recent estimate was that up to 22 billion doses of mRNA vaccine will be required to control COVID-19. Pfizer, BioNTech and Moderna are forecast to manufacture only 7 billion doses between them in 2022, so there is a 15 billion dose shortfall⁹⁸. The only way to reach these levels of production fast enough is for the mRNA vaccine recipes to be shared and other producers enabled to make them.

At the same time, manufacturers like Pfizer and Moderna are producing new, post-Omicron versions of their vaccines⁹⁹. These are not only likely to divert production capacity, they will be extremely sought after with rich nations once again likely to monopolise purchases of limited supplies of these second-generation vaccines.

Furthermore, the failure to vaccinate the world quickly means this pandemic will be prolonged and the virus is predicted to become endemic. That will mean long-term, ongoing need for vaccines that may require continued adaptation to respond to variants.

Giving all countries the right and ability to produce vaccines regionally or domestically is the surest way to ensure vaccines for all, now and for the long-term.

Myth 8: Poor countries don't have the competency to make these complicated vaccines.

Reality: There are over a hundred competent manufacturers across Africa, Asia, and South America capable of producing mRNA vaccines.

The CEO of Pfizer, Albert Bourla, dismissed the idea of developing countries manufacturing the COVID vaccine - "I'm not sure of the point of transferring a technology that is going to take years to transfer, this is what we do. I'm not sure they want, to give it to someone else to do?"¹⁰⁰

Human Rights Watch, with experts from MSF and AccessIBSA, identified over 100 companies across Africa, Asia, and Latin America that have the capacity and capabilities to make an mRNA vaccine but are unable to because of the refusal of pharmaceutical companies to waive intellectual property rights and share the vaccine technology.¹⁰¹

Without any assistance from Moderna, the WHO-backed mRNA manufacturing hub in South Africa has been successful in its initial efforts similar to Moderna's vaccine. The WHO plans to distribute the technology and know-how for this and future improved versions of the vaccine as a global public good to manufacturers around the world. Successful output would be fast-tracked to a matter of months if Moderna helped in this endeavour. But Moderna has so far refused to do so, committing only to not enforce any of its intellectual property rights for the duration of the pandemic.

The WHO also keeps a list of competent manufacturers and has a facility for sharing all COVID-19 technology (C-TAP) but no vaccine manufacturer has signed up to date.

While there is urgent need for a surge of investment in additional vaccine manufacturing capacity in many developing countries, the capabilities and capacities also exist now to make a massive difference in the scale and redistribution of production via a different model that secures sustainable, timely and affordable access to these life-saving vaccines for all. The barriers are not technical they are political and commercial.

Myth 9: The pandemic has hit the economies of rich countries the hardest

Reality: Economies of wealthy countries are beginning to bounce back while poorer countries continue to suffer.

The pandemic caused millions of people to lose their jobs and shrank the global economy. Every country felt the effect of the virus as businesses ground to a halt around the world.

Wealthy countries were in a position where they could respond, pumping billions into their financial markets through fiscal and monetary stimulus. When vaccines became available, they attempted to save lives and insulate their economies by ensuring their countries were first in line for doses.

Early in the pandemic, the International Chamber of Commerce estimated that the global economy stood to lose as much as US\$9.2 trillion if governments fail to ensure developing economy access to vaccines¹⁰². Due to the interconnected nature of supply chains, they said half of this blow would be felt by rich countries. According to World Bank estimates, low income countries have lost out on \$38bn in GDP growth due to vaccine inequality¹⁰³.

According to the International Labour Organisation, high income countries have begun to see the benefits of high vaccination rates and economic stimulus packages on their jobs and economic recovery. However, in low-income and lower middle-income countries, working hours have continued to decrease or stagnate.¹⁰⁴

This isn't an inevitable path. Every additional 10 percentage points in the share of the population becoming fully vaccinated is associated with the equivalent of 52 million full-time jobs being recovered. With equitable vaccine access, in just three months low income countries would see working hours increase by two percentage points, closing the gap with high income countries¹⁰⁵.

Myth 10: We've got vaccines, we don't need a People's Vaccine.

Reality: We will not gain the upper hand on the coronavirus until we make sure everyone, everywhere has access to vaccines.

A People's Vaccine has the support of leaders and scientists from 110 countries, 150 Nobel laureates and former world leaders, and millions of members of the public. We set out five key steps to bring about a People's Vaccine in the following section.

3. THE WAY FORWARD

An often-quoted definition of insanity is to keep doing the same thing and expect a different outcome.

Omicron has exposed the insanity of continuing vaccine inequality, comparable to trying to put a fire out in just one room of a burning house and expecting to save the building. Omicron should be the wake-up call for an urgent change in strategy.

Reliance on donations from rich countries to end the current inequality is neither effective nor just.

Concentrating vaccine manufacturing in a handful of countries leaves developing countries dependent on global solidarity, found desperately wanting in this pandemic.

Allowing pharmaceutical companies to prioritise profit over equitable distribution will see developing countries endlessly pushed to the back of the vaccine queue.

As we reflect on this two-year mark, and as we approach the grim milestone as many as 20 million people dead, we still have a chance to get on the right path, to take the steps that will save millions more from losing their lives or loved ones.

There are five key steps that governments can take to bring an end to the COVID-19 pandemic and leave a legacy of a more robust and equitable system of global health.

Global leaders must act now to:

- 1. Urgently agree and implement a global roadmap to deliver the WHO goal of fully vaccinating 70 percent¹⁰⁶ of people by mid-2022, and beyond this ensure sustained, timely and equitable access worldwide to COVID-19 vaccines, treatments, tests and other medical technologies, including next generation vaccines for COVID-19.**

The roadmap should be based on a comprehensive global manufacturing and distribution plan for the vaccines and all COVID-19 products and technologies, fully funded with fair share financing from rich nations, and fair allocation of doses. It must guarantee vaccines of sufficient number to fully vaccinate 70% of people in all countries by mid-2022, including offering the vaccine to 100% of health workers in Low-Middle-Income Countries (LMICs), as well as prioritising the most vulnerable and hard to reach groups. Beyond 2022 and the 70% target, the world must ensure that there continues to be sustained, timely and equitable access to COVID-19 vaccines, treatments, tests, and other medical technologies.

- 2. Maximise the production of safe and effective vaccines and other COVID-19 products by suspending relevant intellectual property rules and ensuring the mandatory pooling of all COVID-19 related knowledge, data and technologies so that any nation can produce or buy sufficient and affordable doses of vaccines, treatments and tests.**

Endorse and support the World Health Organisation COVID-19 Technology Access Pool (C-TAP) and regional mRNA hubs, to facilitate sharing vaccine, tests and treatments technologies, know-how and intellectual property, and use all policy and legal tools available to compel pharmaceutical corporations to contribute to them.

Immediately support the proposal by India and South Africa at the World Trade Organisation to temporarily waive relevant intellectual property rules under the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs) for COVID-19 vaccines, tests, treatments, and other technologies.

3. Invest public funding now in a rapid and massive increase in vaccine manufacturing as well as research and development (R&D) capacity to build a global distributed network capable of and governed to deliver affordable vaccines as global public goods to all nations.

All countries must invest in creating regional R&D and manufacturing hubs, prioritizing new capacity in developing countries. The African Union for example has set a target that it will manufacture 60% of its own vaccines. This financing should be based on a system where countries pay a share according to their wealth. This should guarantee the long-term public investment needed to develop and maintain the human capital and physical manufacturing infrastructure required to meet needs now and for future pandemics.

Due to the clear failure of the market alone in ensuring enough vaccines, governments should retain sufficient ownership of these new facilities and work in partnership with the WHO, to ensure their strategic direction and output serves the public interest first.

4. COVID-19 vaccines, treatments and tests are sold to governments and institutions at a price as close to the true cost as possible, provided free of charge to everyone, everywhere, and allocated according to need.

Vaccines are global public goods and must be provided free of charge to people. They must also be sold to all governments and international institutions at a price as close to the true cost as possible.

Governments should use all policy and legal tools possible to drive down the price of vaccines, tests, and treatments to reflect 'true cost' and public funding levels to maximise affordability and secure the lowest possible price. Governments should act fast to apply punitive measures to any company that is found to be profiteering.

Vaccine distribution plans should follow the WHO Equitable Allocation Framework with priority given to frontline workers, people at risk and resource-poor countries with the least capacity to save lives.

5. Scale up sustainable investment in public health systems.

Governments should urgently scale up national and global financial support for upgrading and expanding public health systems especially primary health care and for the millions of additional health workers needed for a successful vaccine roll out and for delivering everybody's right to health care. Health services should be free at the point of use, and all user fees eliminated.

Sustained financing of healthcare is urgently needed to ensure global security from emerging diseases and realise the goal of Universal Health Coverage and achieve the right to health for all. We must use the experience of the pandemic to transform health systems across the world - resilient, universal, and equitable health systems are a global public good needed to respond to emergencies but also to protect and save lives every day.

DATA APPENDIX

Table 1: The Economist's estimated cumulative excess deaths by World Bank income category

Country	Date	Population	Excess death	Percentage share
High income	20/02/2022	1,241,193,758	2,705,595.93	14%
Low income	20/02/2022	704,080,579	1,244,204.77	6%
Lower middle income	20/02/2022	2,994,738,553	9,326,638.50	48%
Unknown income group	20/02/2022	258,910	- 112.91	0%
Upper middle income	20/02/2022	2,928,412,447	6,313,848.08	32%
Total		7,868,684,247	19,590,174.37	

Table 2: Our World in Data vaccination rates by World Bank Income group

Income group	Percentage of people fully vaccinated	Percentage people with booster
High income	73	40
Upper middle income	75	26
Lower middle income	45	4
Low income	6	0

Table 3: Airfinity data on vaccine delivery. Includes donations delivered to their end destination. J&J requires one dose, all others require two for full vaccination.

Income group	Vaccines delivered enough to fully vaccinate	Population
High-income	1,380,813,350	1,241,193,758
Upper-middle-income	2,654,419,260	2,928,412,447
Lower-middle-income	2,153,679,028	2,994,738,553
Low-income	148,719,440	704,080,579

Table 4: Airfinity data Total deliveries of AstraZeneca, J&J, Moderna, and Pfizer/BioN-Tech by income group as of 17th February¹

	Deliveries by Income group	% of delivery by Income group
J&J		
High-income	86415626	25.0
Low-income	82081050	23.8
Lower-middle-income	104156447	30.2
Upper-middle-income	72615750	21.0
Total	345268873	
AstraZeneca		
High-income	290461999	11
Low-income	40196400	2
Lower-middle-income	1905778320	73
Upper-middle-income	384181130	15
Total	2620617849	
Pfizer/BioNTech		
High-income	1711755322	61.0
Low-income	29370880	1.0
Lower-middle-income	466227551	16.6
Upper-middle-income	597870975	21.3
Total	2805224728	
Moderna		
High-income	548531943	69.8
Low-income	11157400	1.4
Lower-middle-income	181965120	23.2
Upper-middle-income	43780700	5.6
Total	785435163	

¹ Airfinity data is based on public sources. All companies mentioned in this report were provided with the opportunity to comment on these figures. Where there were differences between Airfinity data and the company's private response – the company was asked to make this data publicly available.

NOTES

- ¹ <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>
- ² Our World in Data, as of 20th February 2022
- ³ There are uncertainties around the Economist's model of excess deaths, in particular the machine-learning model that fills in gaps in countries where official excess death figures are not reported. The team of data scientists behind the model point out in their methodology that these are the best estimates available and provide a range based on a 95% confidence interval. We have chosen to use the middle range of their confidence interval in this paper. For a discussion of modelling excess deaths because of COVID-19 by various institutions see <https://www.nature.com/articles/d41586-022-00104-8>
- ⁴ <https://www.economist.com/graphic-detail/coronavirus-excess-deaths-estimates> as of 21st February 2022
- ⁵ The Economist and Solstad (corresponding author), S., 2021. The pandemic's true death toll. [online] The Economist. Available at: <https://www.economist.com/graphic-detail/coronavirus-excess-deaths-estimates> Accessed 21st February. First published in the article "Counting the dead", *The Economist*, issue 20, 2021.
- The Economist estimates that 19.6 million people have died as a result of the COVID-19 pandemic – counting began on 1st January 2020 and the most recent data is 20th February 2022.
- ⁶ UN 2018 population estimates <https://www.un.org/development/desa/publications/2018-revision-of-world-urbanization-prospects.html>
- ⁷ Data retrieved from The Economist's data repository. <https://github.com/TheEconomist/covid-19-the-economist-global-excess-deaths-model> File: output-by-world-bank-income group/wb_income_groups_cumulative.csv. As of 21st February 2022.
- ⁸ The estimates shown are minimums for the numbers of children affected by COVID-19 and excess deaths during the pandemic, following the statistical methodology for global extrapolations in Hillis, Unwin, Chen et al, "Global minimum estimates of children affected by COVID-19-associated orphanhood and deaths of caregivers: a modelling study", *The Lancet*, 2021 and "Children: The Hidden Pandemic 2021. A joint report of COVID-19 associated orphanhood and a strategy for action." https://imperialcollegelondon.github.io/orphanhood_trends/
- Between January 23 2020 and January 14th February 2022 (most recent available data) 4,740,309 children have been affected by Orphanhood globally. In India the figure stands at 2,127,975.
- ⁹ Economist excess death estimates 1. Date range 8th November 2021-20th February 2022
- ¹⁰ See Inequality Kills, Oxfam, p.28 <https://www.oxfam.org/en/research/inequality-kills>
- ¹¹ <https://policy-practice.oxfam.org/resources/inequality-kills-the-unparalleled-action-needed-to-combat-unprecedented-inequal-621341/>
- ¹² https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/briefingnote/wcms_824092.pdf
- ¹³ <https://www.forbes.com/sites/giacomotognini/2021/04/06/meet-the-40-new-billionaires-who-got-rich-fighting-covid-19/?sh=5bf6bfd517e5>
- ¹⁴ World Health Organisation. (2021). Violence against women prevalence estimates, 2018: Executive summary. <https://www.who.int/publications/i/item/9789240026681>
- ¹⁵ <https://policy-practice.oxfam.org/resources/the-ignored-pandemic-the-dual-crises-of-gender-based-violence-and-covid-19-621309/>
- ¹⁶ *ibid*
- ¹⁷ <https://www.cgdev.org/publication/global-childcare-workload-school-and-preschool-closures-during-covid-19-pandemic>
- ¹⁸ [https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_813449/lang-en/index.htm#:~:text=Globally%2C%20between%202019%20and%202020,cent%2C%20or%2060%20million%20jobs.&text=The%20Americas%20experienced%20the%20greatest,reduction%20of%209.4%20per%20cent\).](https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_813449/lang-en/index.htm#:~:text=Globally%2C%20between%202019%20and%202020,cent%2C%20or%2060%20million%20jobs.&text=The%20Americas%20experienced%20the%20greatest,reduction%20of%209.4%20per%20cent).)
- ¹⁹ <https://www.oxfam.org/en/research/inequality-virus>
- ²⁰ L. Addati, U. Cattaneo, V. Esquivel and I. Valarino (2018). Care Work and Care Jobs for the Future of Decent Work. Geneva: International Labour Organization (ILO). https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/--publ/documents/publication/wcms_633135.p
- ²¹ M. Bolis, et al. (2020). *Care in the Time of Coronavirus: Why care work needs to be at the centre of a post-COVID-19 feminist future*. Oxfam. <https://policy-practice.oxfam.org/resources/care-in-the-time-of-coronavirus-why-care-work-needs-to-be-at-the-centre-of-a-po-621009/>. DOI: 10.21201/2020.6232
- ²² ILO and WEIGO. (2019). Women and Men in the Informal Economy: A Statistical Brief <https://www.oecd.org/gender/data/womenandinformality.htm>

- ²³ L. Vahedi, J. Anania and J. Kelly. (2021). Gender-Based Violence and COVID-19 in Fragile Settings: A Syndemic Model. United States Institute of Peace Special Report <https://www.genderandcovid-19.org/wp-content/uploads/2021/08/Gender-Based-Violence-and-COVID-19-in-Fragile-Settings-A-Syndemic-Model.pdf>
- ²⁴ Human Rights Watch. (2020). Submission to the UN special rapporteur on violence against women, its causes and consequences regarding COVID-19 and the increase of domestic violence against women <https://www.hrw.org/news/2020/07/03/submission-un-special-rapporteur-violence-against-women-its-causes-and-consequences>
- ²⁵ ILO and UN Women. (2020). COVID-19 and Women Migrant Workers in ASEAN https://www.spotlightinitiative.org/sites/default/files/publication/COVID-19_and_Women_in_ASEAN.pdf
- ²⁶ <https://www.bbc.co.uk/news/uk-england-coventry-warwickshire-59566578>
- ²⁷ Our World in Data as of 21st February 2022
- ²⁸ Our World in Data as of 21st February 2022
- ²⁹ Our World in Data as of 21st February 2022. High income countries have administered 480,925,632 booster doses, 75,964,884 people in low income countries have received at least one vaccine dose.
- ³⁰ <https://www.airfinity.com/insights/240-million-covid-19-vaccines-set-to-expire-by-march-according-to-analysis>
- ³¹ Our World in Data, as of 21st February 2022
- ³² According to UNICEF on 31st December 2021 COVAX had delivered 907 million doses, with 306 million of these delivered in December. COVAX originally promised to deliver 1.9 billion doses by end of 2021. <https://us20.campaign-archive.com/?u=40658b1a132cdc263e35b5b97&id=479b2344ed> On 17th January 2022 the scheme announced it has delivered 1 billion doses. <https://www.gavi.org/news/media-room/world-leaders-launch-call-renewed-support-vaccination-2022-part-global-fight>
- ³³ <https://msfaccess.org/covax-broken-promise-world>
- ³⁴ Airfinity as of 22/02/2022. Includes donations at their end destination. J&J requires one dose, all others require two for full vaccination.
- ³⁵ <https://www.businesswire.com/news/home/20210110005098/en/Governments-Spent-at-Least-%E2%82%AC93bn-on-COVID-19-Vaccines-and-Therapeutics-During-the-Last-11-Months>
- ³⁶ <https://www.medicalcountermeasures.gov/app/barda/coronavirus/COVID19.aspx?filter=vaccine>
- ³⁷ Authors calculations based on Moderna's Q4 financial results <https://investors.modernatx.com/news/news-details/2022/Moderna-Reports-Fourth-Quarter-and-Fiscal-Year-2021-Financial-Results-and-Provides-Business-Updates/default.aspx>
- ³⁸ See *The Great Vaccine Robbery Peoples Vaccine Policy Brief* https://webassets.oxfamamerica.org/media/documents/The_Great_Vaccine_Robbery_Policy_Brief.pdf?gl=1*1q58wlt*ga*MTM2MjMyNTIzMi4xNjI5OTczMjgz*ga_R58YETD6XK*MTYzNTUwNTEwNC45LjAuMTYzNTUwNTEwNi41QA..
- ³⁹ <https://reliefweb.int/report/world/pfizer-biontech-and-moderna-making-1000-profit-every-second-while-world-s-poorest> We estimate the combined 2021 profit before tax for Moderna and Pfizer and BioNTech as \$34 billion. There are 8760 hours in a year giving \$3,881,279 an hour.
- ⁴⁰ Airfinity as of 22/02/2022. See appendix for table.
- ⁴¹ Unicef COVID-19 Vaccine Market Dashboard <https://www.unicef.org/supply/covid-19-vaccine-market-dashboard>
- ⁴² Airfinity as of 22/02/2022. See appendix for table.
- ⁴³ <https://www.oxfam.org/en/press-releases/rich-countries-have-received-more-vaccines-run-christmas-african-countries-have-all>
- ⁴⁴ Authors calculations based on <https://msfaccess.org/no-patents-no-monopolies-pandemic>

Support TRIPS?	Number of countries	Share of population
Yes	110	79%
Undecided	4	4%
No	31	17%

- ⁴⁵ Economist excess deaths data between 19th October 2020 and 20th February 2022.
- ⁴⁶ <https://msfaccess.org/pharmaceutical-firms-across-asia-africa-and-latin-america-potential-manufacture-mrna-vaccines>
- ⁴⁷ <https://www.medrxiv.org/content/10.1101/2022.02.08.22270465v1>
- ⁴⁸ <https://www.nature.com/articles/d41586-021-02483-w>

⁴⁹ <https://theintercept.com/2021/04/23/covid-vaccine-ip-waiver-lobbying/>

⁵⁰ <https://corporateeurope.org/en/2021/05/big-pharmas-lobbying-firepower-brussels-least-eu36-million-year-and-likely-far-more>

⁵¹ Authors calculations based on Airfinity data as of 22/02/2022

Country	Total deliveries to date of Moderna and Pfizer/BioNTech COVID-19 vaccine doses
Germany	2,052,834,989
Switzerland; Spain	525,905,363
United States	1,515,943,749
Grand Total	4,094,684,101

⁵² <https://www.reuters.com/article/us-germany-economy-biontech-idUSKBN2FB15A>

⁵³ <https://www.oxfam.org/en/press-releases/eu-set-bin-25-million-more-vaccine-doses-it-has-donated-africa-year>

⁵⁴ <https://www.bloomberg.com/graphics/2021-pfizer-secret-to-whats-in-the-covid-vaccine/?sref=qneqM2kv?srd=premium-europe>

⁵⁵ <https://www.citizen.org/article/pfizers-power/>

⁵⁶ Authors calculations based on Our World in Data. Over the last 14 days (as of 22/02/2022) Low income countries have administered 506,045 doses per day. 624,616,861 require 2 and 35,432,705 people need their second dose doses (assuming 2 doses to fully vaccinate).

⁵⁷ <https://static1.squarespace.com/static/5e937afb7a75746167b39c/t/61d7319fa44b86311064d8ca/1641492898952/Omicron+Final+PDF.pdf>

⁵⁸ https://www.bloomberg.com/news/features/2022-02-13/when-will-covid-end-what-new-covid-variants-post-pandemic-life-mean-for-2022?utm_source=twitter&utm_medium=social&utm_campaign=twitter-moments&utm_content=business

⁵⁹ <https://reliefweb.int/report/world/crisis-deepening-gordon-brown-warns-unjustified-covid-19-complacency-and-16-billion-gap>

⁶⁰ <https://erictopol.substack.com/p/where-do-we-stand-with-omicron>

⁶¹ <https://erictopol.substack.com/p/where-do-we-stand-with-omicron>

⁶² [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(22\)00100-3/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(22)00100-3/fulltext)

⁶³ From Our World in Data; as of 22.02.22. <https://ourworldindata.org/covid-vaccinations>

⁶⁴ Economist excess death estimates. Date range 8th November 2021-20th February 2022

⁶⁵ Author calculations based on The Economist excess death estimates

⁶⁶ <https://www.cdc.gov/coronavirus/2019-ncov/downloads/community/orphanhood-report.pdf>

⁶⁷ https://imperialcollegelondon.github.io/orphanhood_calculator/#/country/Global See note 8.

⁶⁸ <https://srcd.onlinelibrary.wiley.com/doi/full/10.1111/cdev.13658>

⁶⁹ <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/184161638768635066/executive-summary>

⁷⁰ <https://policy-practice.oxfam.org/resources/the-ignored-pandemic-the-dual-crises-of-gender-based-violence-and-covid-19-621309/>

⁷¹ Our World in Data. As of 22/02/2022

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⁷³ <https://blogs.worldbank.org/developmenttalk/lot-would-take-shot-covid-19-vaccine-acceptance-six-sub-saharan-african-countries>

⁷⁴ <https://www.nature.com/articles/s41591-021-01454-y>

⁷⁵ <https://africacdc.org/download/covid-19-vaccine-perceptions-a-15-country-study/>

⁷⁶ <https://www.airfinity.com/insights/240-million-covid-19-vaccines-set-to-expire-by-march-according-to-analysis>

⁷⁷ <https://www.gavi.org/news/media-room/joint-statement-dose-donations-covid-19-vaccines-african-countries>

- ⁷⁸ Donation pledges from <https://www.thinkglobalhealth.org/article/billions-committed-millions-delivered> and delivery data from Airfinity
- ⁷⁹ <https://accesstomedicinefoundation.org/access-to-medicine-index/results/r-d-for-covid-19-has-increased-yet-other-pandemic-risks-go-unaddressed>
- ⁸⁰ Ibid.
- ⁸¹ <https://accesstomedicinefoundation.org/access-to-medicine-index/results/r-d-for-covid-19-has-increased-yet-other-pandemic-risks-go-unaddressed>
- ⁸² <https://www.sciencedirect.com/science/article/pii/S0264410X21002905?via%3Dihub>
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- ⁸⁴ <https://www.medicalcountermeasures.gov/app/barda/coronavirus/COVID19.aspx>
- ⁸⁵ <https://reliefweb.int/report/world/pfizer-biotech-and-moderna-making-1000-profit-every-second-while-world-s-poorest> and <https://investors.modernatx.com/news/news-details/2022/Moderna-Reports-Fourth-Quarter-and-Fiscal-Year-2021-Financial-Results-and-Provides-Business-Updates/default.aspx>
- ⁸⁶ <https://www.oxfam.org/en/press-releases/covid-vaccines-create-9-new-billionaires-combined-wealth-greater-cost-vaccinating>
- ⁸⁷ See table 4 in data appendix
- ⁸⁸ <https://www.scientificamerican.com/article/for-billion-dollar-covid-vaccines-basic-government-funded-science-laid-the-groundwork/>
- ⁸⁹ Authors calculations based on <https://investors.modernatx.com/news/news-details/2022/Moderna-Reports-Fourth-Quarter-and-Fiscal-Year-2021-Financial-Results-and-Provides-Business-Updates/default.aspx>
- ⁹⁰ Based on the combined vaccine revenue and pre-tax profit figures of BioNTech and Pfizer as set out here <https://reliefweb.int/report/world/pfizer-biotech-and-moderna-making-1000-profit-every-second-while-world-s-poorest>
- ⁹¹ https://csimarket.com/Industry/industry_Profitability_Ratios.php?sp5
- ⁹² Authors calculations using <https://reliefweb.int/report/world/pfizer-biotech-and-moderna-making-1000-profit-every-second-while-world-s-poorest> and <https://investors.modernatx.com/news/news-details/2022/Moderna-Reports-Fourth-Quarter-and-Fiscal-Year-2021-Financial-Results-and-Provides-Business-Updates/default.aspx>
- ⁹³ <https://investors.pfizer.com/Investors/Financials/Quarterly-Results/>
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