

Conquering COVID: How Global Vaccine Inequality Risks Prolonging the Pandemic

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The development of effective vaccines during the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic has been deemed a towering achievement in modern science. Since the end of 2020, the vaccine rollout has offered the promise of vanquishing the pandemic in the United States and other developed countries. Even as the United States and other wealthier nations encounter both setbacks and successes in their coronavirus disease 2019 (COVID-19) eradication efforts, developing countries around the world are likely to face far less fortunate fates. With much of the world's vaccine production and distribution capacity reserved by wealthier nations, impoverished countries stand to face devastating financial, social, and health-related impacts. The consequences of this disparity will resonate deeply into the collective fabric of these countries, ensuring that the economic and geopolitical imbalance between developed and developing nations will widen even more substantially. Wealthier countries must do more to eliminate the inequality that exists in widespread SARS-CoV-2 vaccine availability in less-developed nations. Like HIV, tuberculosis, malaria, and other global epidemics, COVID-19 cannot be forgotten just because the pandemic is eventually contained from the shores of wealthier nations. For as long as the pandemic rages in any corner of the globe, the world will never be truly rid of COVID-19. And all nations, rich or poor, will suffer the consequences.

A 90-year-old grandmother was seen at a local hospital in Central England last December 8 for an early morning appointment. For the United Kingdom, in the midst of a somber Christmas season, it felt like a major turning point. In a country among the hardest hit in Europe, struggling with the then highly contagious Alpha variant of the SARS-CoV-2 virus, the simple act of vaccinating an elderly patient—the world's first—offered hope.

In the United States, where Emergency Use Authorization approval of the first mRNA vaccines occurred just days later (December 11 for Pfizer-BioNTech and December 18 for Moderna), vaccinations began in earnest in mid-December. Initial US vaccine distribution struggled. Overwhelmed online registration

portals, long lines, and public frustration were common in the first few months of 2021. The ramping up of vaccine manufacturing and distribution through much of the Spring and the February approval of the Johnson & Johnson vaccine greatly boosted vaccinations, peaking in mid-April with an average of >3.3 million daily doses being given. By May 15, about 60% of US adults had received a first dose, and less than half were fully vaccinated. However, as the winter third wave began to subside, vaccine interest and daily administered doses took a deep dive, declining by late summer to about one-quarter of their springtime peak. At the same time, the perceived goal of reaching “herd immunity” seemed like a mirage, becoming increasingly unattainable given the slowing pace of US vaccination and the emergence of new and even more contagious COVID-19 variants [1].

The struggles in the United States and other developed countries to quickly immunize their populations against COVID-19 demonstrates that vaccination programs require not only the availability of effective vaccines, but also an

organized system for distributing and administering them to a receptive public. Though Sub-Saharan Africa, India, and many Southeast Asian countries have historically launched successful mass vaccination and mass drug distribution programs, instituting such programs for COVID-19 vaccines may not be the biggest hurdle. Many of the world's most impoverished nations stand a real risk of being left behind in the race to end the pandemic simply because of lack of access to vaccine stocks already reserved by higher-income nations.

In the early months of the COVID-19 pandemic, as pharmaceutical companies began research and development of vaccine candidates, the United States government invested billions of dollars to fund the production of the most promising vaccines, accelerating them at a pace that would have been otherwise impossible. In exchange for the support offered by programs like “Operation Warp Speed” (OWS) as well as advance purchase agreements to those companies that did not accept OWS funds, there came a condition: that Americans would get priority access to US manufactured doses.

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With no clear early leader, the United States and other high-income countries hedged their bets, placing large preorders from most of the major vaccine developers and establishing options to acquire even more. For the United States, this included commitments to acquire up to 600 million doses of the Pfizer vaccine and up to 500 million doses of the Moderna vaccine. In addition, the Trump administration preordered 810 million doses from AstraZeneca, Johnson & Johnson, NovaVax, and Sanofi combined, with up to 1.5 billion doses available in expansion deals. With similar agreements put forth by other nations, some of the world's wealthiest countries soon acquired the capability to inoculate their citizens multiple times over: 2x over in the European Union, 4x over in Britain and the United States, and 6x over in Canada. Thus, effectively, the high-income countries essentially "emptied the medicine cabinet" ahead of the rest of the world, leaving many of the globe's most impoverished nations to fend for themselves [2].

According to the People's Vaccine Alliance, a group including Amnesty International, Frontline AIDS, Global Justice Now, and Oxfam, in 67 poorer nations, only 1 in 10 will be vaccinated against COVID-19 in 2021. In 5 of the 67 countries, Kenya, Myanmar, Nigeria, Pakistan, and the Ukraine, as of August 1, >4 million cases have occurred, ranking this group as 12th in the world in total cases if they together represented a single country [3].

The inequality of vaccine distribution parallels another global economic reality. As wealthy nations vaccinate more quickly than poorer states, they will emerge economically and strategically sooner from the pandemic. In this way, the disparity between developed and developing countries will further worsen, as disadvantaged countries continue to face devastating impacts while being forced to expend limited economic resources on medical care and vaccines. This consequences could shape their economic futures for years to come [4].

Recognizing this disparity, a group of international aid organizations, private sector philanthropists, and leading nations have pledged to an initiative to make sure that all nations have global equitable access to COVID-19 vaccines and other therapeutics. The leading initiative in this effort is COVAX, the vaccine pillar of the Access to COVID Tools (ACT) Accelerator Partnership. The effort is a collaboration between CEPI, GAVI, the World Health Organization (WHO), and the Gates Foundation to secure at least 2 billion vaccine doses by the end of 2021 as well as additional production capacity. As of June 2021, however, the initiative had secured <\$10 billion of funding of a targeted \$38 billion [5]. Although the Trump administration had withdrawn support of the WHO and the ACT Accelerator in 2020, recommitment of support to the WHO and vaccine initiatives was asserted by the incoming Biden administration in February 2021, and up to \$4 billion was pledged to the COVAX initiative [6]. Recently, in the face of international pressure from escalating COVID-19 outbreaks in India and South America, the Biden administration initially agreed to share 80 million vaccine doses with about 50 countries, up to 75% through COVAX [7].

For wealthy countries and pharmaceutical companies, much more can be done to fight global vaccine inequality. The US Biden administration's pledge to rejoin the WHO, share vaccine doses, and provide financial support to COVAX in 2021 is a good start, though participation in this vaccine initiative has not curtailed many wealthier nations from making 1-to-1 deals with pharmaceutical manufacturers, further constraining the supply [8]. A groundswell of international nations and global health organizations has campaigned to temporarily waive intellectual property (IP) rights for coronavirus vaccines, arguing that all countries should be permitted to manufacture their own vaccines during a pandemic. The Gates Foundation has faced criticism, for example, for encouraging Oxford

to sell exclusive rights to its vaccine to AstraZeneca rather than allowing it to be open-sourced. Pharmaceutical firms should commit to not exploiting COVID-19 vaccines for profit above their development and production costs. Pharma should also consider vaccine licensing agreements with manufacturers in less developed nations, an issue that resonates back to the struggle to bring generic HIV drugs to South Africa 2 decades ago. Excess stocks of COVID-19 vaccines should be freely shared with international distribution partners such as the WHO. Wealthier nations also have a moral obligation to fund investments in vaccine storage, delivery, and administration infrastructure in poorer nations—and to be held accountable not just for their pledges of vaccines and financial support, but on their deliverables. Lastly, underdeveloped nations bear some responsibility in developing their own vaccine production capabilities. Once resource-challenged, China and India have become global exporters of vaccines. Organizations such as the Developing Countries Vaccine Manufacturers Network should be supported and broadened to help develop vaccine production capability in underserved nations.

For wealthy nations interested in getting their people and their economies back to a prepandemic sense of normalcy, a simple realization remains: As long as the pandemic rages on in any corner of the globe, no matter how remote, the world will not be rid of COVID-19. And all nations, rich or poor, will suffer the consequences. Researchers at RAND Europe recently asserted that COVID-19 vaccine inequality stands to cleave \$1.2 trillion annually in global gross domestic product (GDP). For the poorest nations, it could take as much as a decade for their economies to rebound. WHO Director General Tedros Adhanom Ghebreyesus has warned that the "me-first approach" of wealthier nations amounts to a "catastrophic moral failure...paid with lives and livelihoods in the world's poorest countries." The Director General

recently called for a global moratorium on COVID-19 vaccine booster doses in wealthier countries through September 2021, noting that only about 1% of people in impoverished nations had even received a single shot [9]. Perhaps the very definition of the word “pandemic,” from the Greek word *pandemos*, meaning “all of the people,” needs greater emphasis. Only by working together can wealthier and more impoverished nations end the COVID-19 crisis. As Martin Luther King Jr. wrote, “We are caught in an inescapable network of mutuality, tied in a single garment of destiny. Whatever affects one directly, affects all indirectly.”

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