Global Covid-19 Vaccine Distribution Handbook
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Executive Summary
The dramatic impacts of Covid-19 are clear: millions of lives lost, healthcare systems devastated, and a global economic crisis from which it will take years to recover. Although nearly 50 percent of the U.S. population is already fully vaccinated, fewer than 1 percent of people living in low- and middle-income countries (LMICs) have been vaccinated. SARS-CoV-2 variants that emerge in other parts of the world will remain a significant threat until the herd immunity rate of 80 percent is reached globally. After years of U.S. retreat from the international community, the Biden-Harris administration can restore the United States’ standing as a global leader and put the world on a path to recovery by using its considerable tools, resources, and remaining influence to strengthen the supply chains and healthcare systems necessary to distribute vaccines. The Biden-Harris administration should use these resources to ensure that vaccines are distributed equitably, efficiently, and effectively around the world as it would not only restore U.S. global public health leadership, but also prevent the emergence of future coronavirus variants. Amid the successful and speedy development of vaccines while new, more contagious variants are ravaging countries like India, now is the time for the United States to step up. The United States and its allies have the capacity to strengthen vaccine supply chains globally though both engaging in strong public–private partnerships, especially with global logistics companies, and through the use of existing multilateral architecture, especially the Covid-19 Vaccines Global Access (COVAX) Facility. Failing to do so would not only result in increased loss of life and further economic downturn, but also prove detrimental to the United States’ standing in the world. The Biden-Harris administration should consider the following recommendations:

1. Leverage existing multilateral architecture, particularly COVAX, to strengthen supply chains and expand global capacities to deliver vaccines.

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2. Fill gaps in multilateral efforts through bilateral vaccine donations, direct investment in health systems, and support to in-country distribution infrastructure, which includes customs clearance, storage, transportation, and last-mile delivery. Use existing service delivery platforms developed by the President’s Emergency Plan for AIDS Relief (PEPFAR) to distribute vaccines across countries.

3. Strengthen public–private partnerships to help fill gaps and leverage private-sector knowledge and capacity to move quickly, securely, and efficiently.

4. Ensure that outdated policies, especially those surrounding trade, taxation, and customs, do not slow or prevent global distribution.

5. Adopt a whole-of-government approach that takes full advantage of various agencies’ institutional and technical capabilities but also delineates clear roles and responsibilities for each agency.

6. Engage and integrate local and grassroots actors, whose perspectives are invaluable to understanding healthcare systems, access to healthcare, and community outreach.

A crisis of this magnitude requires a response of equal scale, and the United States should play a leadership role in global efforts to prevent and mitigate the spread of variants. The Biden-Harris administration has already taken important steps toward supporting global efforts. These include a $2 billion commitment to COVAX, the primary multilateral vehicle for vaccine distribution, and a promise for an additional $2 billion through 2022. The American Rescue Plan, which is the administration’s primary domestic response to Covid-19, also included $11 billion for international efforts to address both current Covid-19 challenges and future global pandemic preparedness. In addition to monetary commitments, the Biden-Harris administration announced plans to give COVAX 20 million doses of the AstraZeneca vaccine, which has not yet been authorized by the Food and Drug Administration (FDA), by June 2021 and 60 million doses of Pfizer, Johnson & Johnson, and Moderna—further announcing in early June that it plans to buy an additional 500 million doses of the Pfizer vaccine to donate to the rest of the world. The administration is likewise sending 4 million AstraZeneca vaccines directly to neighboring Canada and Mexico. In April 2021, the Biden-Harris administration also sent $100 million in supplies to India in response to its ongoing crisis. Finally, the administration’s fiscal year 2022 State and Foreign Operations budget request includes nearly $1 billion in new funds—as well as 70 new positions at the U.S. Agency for International Development (USAID)—to boost pandemic preparedness through robust support for the Global Health Security Agenda. These significant steps toward global vaccination make solving distribution problems even more important.

The Covid-19 virus does not respect borders, yet many countries around the world took a nationalistic approach—regarding both protection from the virus and distribution of vaccines—to what is a truly global problem. Even the United States, which has vaccinated a significant portion of the adult population, is in a constant race to keep vaccines effective against emerging strains of Covid-19. The only way to slow the development of new variants and thus move beyond the pandemic is to ensure people are vaccinated on a global scale. Getting doses rapidly to countries in need will require a significant logistical effort on the part of the United States and its bilateral and multilateral partners. Utilizing existing global health supply chains, supporting multilateral efforts, leveraging targeted partnerships with the private sector, and engaging with national governments will speed the delivery of vaccines.

Covid-19 is unlikely to be the last pandemic or health crisis that the world faces, especially as deforestation, biodiversity loss, and climate change increase the possibility of further spillover of zoonotic diseases. Therefore, this pandemic should serve as an inflection point for the international community
to cast aside what the World Health Organization (WHO) has called the “panic-then-forget” cycle, which has been emblematic of previous international responses to global health emergencies. While exclusively strengthening health systems and shoring up health supply chains will not be sufficient to prevent or counter the next public health emergency, stronger and more resilient health systems and supply chains will still be critical to ensuring that future pandemic preparation, detection, and responses can be delivered efficiently, effectively, and equitably. Key takeaways include—but are not limited to—the importance of multisectoral approaches to preparing for in-country delivery (e.g., having an emergency response plan in place), maintaining and expanding geographically diverse manufacturing capabilities, and prioritizing public–private cooperation, as well as establishing or leveraging existing platforms for vaccine administration. Coordination and communication among governments, donors, and private-sector entities (such as third-party logistics firms and manufacturers) is critical. Looking forward, it will be helpful to start by investing in multisectoral approaches that strengthen general health systems and supply chains.

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The Crisis

The Covid-19 crisis has disrupted everyday life, devastating healthcare systems, the global economy, and individual livelihoods. Around the world, Covid-19 is responsible for a total of 175.5 million confirmed cases and has claimed approximately 3.8 million lives. It has exposed a growing number of global social and economic inequities, disproportionally impacting low-income and historically marginalized communities. Within the last year, rates of extreme poverty have increased substantially and, as many believe, will only become more dire as the threat continues. The World Bank estimated that, in 2020, Covid-19 pushed between 88 million and 115 million people into extreme poverty, expecting this figure to increase by an additional 23–35 million people in 2021. This has further contributed to global hunger, with more than 155 million people facing severe food insecurity at the end of 2020. Covid-19 is also harming ongoing public health initiatives by diverting resources away from pharmaceutical development not related to the pandemic, disrupting routine vaccinations, and decimating public health infrastructure. Progress toward broader development targets, such as the Sustainable Development Goals (SDGs), has also regressed as rates rise of extreme poverty, children out of schools, and more. In July, the UN High-level Political Forum will specifically examine recovery from Covid-19 and its impact on the SDGs.

The pandemic has also caused one of the worst global recessions in history, and governments around the world continue to struggle to provide effective relief for their citizens. The International Monetary Fund estimates that the global economy contracted by 3.3 percent during 2020, negatively impacting employment rates, job security, and the flow of global remittances. Furthermore, the pandemic will continue to have long-term effects on children and students, as approximately 1.5 billion children and youth across 160 countries have been impacted by school closures, including and especially migrant and refugee children. According to the United Nations Children’s Fund (UNICEF), 1 in 7 children (214 million...
globally) have “missed more than three-quarters of their in-person learning.” School closures also pose an increased threat to girls’ education, with the United Nations estimating that over 11 million girls and young women are at risk of never going back to school due to the ongoing crisis. The pandemic is also likely to have reversed progress in combating child and maternal morbidity and mortality. Moreover, extensive stay-at-home orders and socioeconomic fallout have increased incidents of gender-based violence around the world.

To get the Covid-19 pandemic under control, the international community will need to be more proactive and predictive, rather than just responsive. More than a year after the emergence of Covid-19, major outbreaks continue to wreak havoc, especially in LMICs. India has become the global center of the pandemic, facing a dual public health and humanitarian crisis of unprecedented scale. From March to May 2021, India’s average daily case load grew by over 2400 percent, and the official number of deaths reached 1 million by June 1. The actual number of cases and deaths are likely even higher due to a shortage of diagnostic tests. Hospitals are already at capacity, and India is facing dangerous shortages of oxygen, medicine, and ventilators, with people turning to social media in desperation to access supplies. New, concerning variants have also emerged, including the B.1.617 strains, which are now intermingling with variants from South Africa and the United Kingdom. In a bid to slow the spread, the government has expanded Covid-19 vaccine eligibility to all adults. However, despite India being one of the world’s largest vaccine manufacturers, its domestic supply is greatly limited, with only 3.4 percent of the population fully vaccinated as of June 2021. Other countries, including the United States, have supported India through the delivery of raw vaccine materials, oxygen, and ventilators, but these supplies are not enough to fill the country’s need.

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The crisis in India provides a critical warning for Washington and the international community. Though U.S. domestic vaccination rates may be high, the world is not truly safe until every country and every person is safe. Furthermore, India was not the first LMIC country—nor will it be the last—to face a major Covid-19 epidemic. Already, neighboring Nepal, Bangladesh, and Pakistan are seeing higher case numbers and increased pressure on their health systems. In Latin America, countries such as Uruguay and Colombia, not just Brazil, are also facing dire pandemic conditions. Without sufficient vaccinations, the question is where the next outbreak will be, not if there will be another outbreak.

Current Biden-Harris Administration Priorities

When the Biden-Harris administration took office in January 2021, one of its top priorities was domestic vaccine distribution. The speed and efficacy with which the administration was able to roll out vaccines across the country provides valuable lessons for global vaccine supply chain distribution. Immediately after taking office, President Biden issued a National Strategy for the Covid-19 Response and Pandemic Preparedness, which included $20 billion to support a national vaccination plan. In order to meet—and
eventually double—his ambitious goal of administering 100 million shots in the first 100 days, Biden took several steps to increase production and distribution. He used the Defense Production Act (DPA) to increase the speed of production by prioritizing federal government needs in the supply chain and activating 1,000 military personnel to bolster his vaccination efforts. Through the DPA, the administration was able to expedite this process by facilitating access to the equipment, machinery, and supplies necessary for vaccine production.

The Biden-Harris administration took three specific actions to increase vaccine supply and directly aid U.S. states in their recovery: (1) expanding vaccine supply; (2) launching a first phase of the Federal Retail Pharmacy Program for Covid-19 Vaccination, which included partnerships with 21 national pharmacies and 40,000 local ones to administer the vaccine; and (3) reimbursing states for the costs of National Guard and Federal Emergency Management Agency (FEMA) personnel who were assisting with vaccine rollout. Through all of these efforts, states were able to administer 100 million shots in only 58 days and 200 million in the first 100 days of the presidency. The successful implementation of President Biden’s plan highlights the importance of organization and planning, strengthening public–private partnerships in vaccine supply chains, and leveraging existing healthcare delivery platforms.

The world has overcome the immense hurdle of developing effective vaccines to counter Covid-19. In the short term, solutions like pre-purchase agreements help address the concerns of vaccine manufacturers and ensure necessary production. But with the planned manufacturing of more than 12 billion vaccine doses by the end of 2021, distribution challenges will become the priority in the medium-to-long term. These include the slow recovery of the transportation industry and the need to ensure a temperature-controlled “cold chain” for vaccines. Thus far in the United States, distribution costs have amounted to $27 per dose. In the quest for herd immunity, this will be a significant burden on developing countries.

Ensuring that all people around the world are vaccinated, independent of nationality or socioeconomic status, is the right thing to do. There are also geostrategic and national security incentives to support Covid-19 vaccine rollout throughout the developing world. Especially due to emerging variants, the world is not safe until all are safe. It is impossible to create and maintain a fully vaccinated bubble at any level smaller than the entire globe. This is a once-in-a-lifetime situation that will require once-in-a-lifetime global cooperation and increased bilateral action. For the United States specifically, it is impossible to heal the domestic economy without also healing the global economy. If vaccines are not made available to LMICs, the International Chamber of Commerce estimates the global economy could lose $9.2 trillion dollars. One of the Biden-Harris administration’s top priorities is restoring the United States’ global standing, and aiding with vaccine distribution is a key opportunity to reassert U.S. leadership.

The Biden-Harris administration has already taken several steps to increase the distribution of Covid-19 vaccines, particularly to LMICs. The administration is primarily working through COVAX, to which it contributed $2 billion in March 2021, the largest donation to COVAX to date, promising another $2 billion through 2022. During the announcement, Secretary of State Antony Blinken highlighted that the administration views equitable vaccine distribution as imperative to ending the Covid-19 pandemic. As part of the American Rescue Plan, the Biden-Harris administration is prioritizing restoring global leadership by committing $11 billion to support the international community’s Covid-19 response and to build up global pandemic resiliency. President Biden also announced his intention to share the United States’ surplus doses. Now, with more than 50 percent of the United States’ eligible adults at least partially vaccinated, sharing upward of 300 million surplus doses seems closer.
Existing Vaccine Distribution Efforts

Vaccine Doses Purchased by Income Level Compared to Share of Global Adult Population

**Figure 1a - Without COVAX redistribution**

- High income: 7%
- Upper middle income: 37%
- Lower middle income: 37%
- Low income: 19%
- COVAX: 1%

**Figure 1b - With COVAX redistribution**

- High income: 13%
- Upper middle income: 3%
- Lower middle income: 12%
- Low income: 18%
- COVAX: 54%

Percentage of Global Population 18 Years and Older

Percentage of Doses Purchased

NOTE: Data updated as of March 15, 2021.
SOURCE: Duke Launch and Scale Speedometer, World Bank • PNG


**COVAX**

To provide vaccines to LMICs, the international community launched COVAX, which is co-led by the Coalition for Epidemic Preparedness Innovations (CEPI), Gavi, and WHO—with other partners such as UNICEF for delivery. It facilitates vaccine acquisition for countries that otherwise might not be able to secure bilateral deals with others that are developing and manufacturing vaccines. Per a COVAX announcement from April, it plans to deliver at least 2 billion doses by the end of 2021. This, however, represents less than 30 percent of the population of LMICs. Even if COVAX were to fully meet this goal, coverage would be substantially less than what is needed for herd immunity, leaving an estimated 41 percent of the global population unvaccinated. Because a portion of COVAX vaccines is earmarked for high-income countries, that percentage of unvaccinated people will likely be greater in LMICs. The facility is already struggling to meet its goals, facing major struggles in acquiring an adequate number of doses. Delays in delivering vaccines also threaten its success, as manufacturers face pressure to prioritize domestic doses and governments work through the challenges of in-country distribution.

Given these struggles, it has become increasingly clear that COVAX should be a part of a broader system to address the challenge. At the February meeting of the Group of Seven, Boris Johnson announced that the United Kingdom would donate the majority of its surplus doses to LMICs; however, exact numbers and plans for distribution are not known yet. In April, New Zealand announced plans to donate 800,000
doses for COVAX distribution; in May, EU leaders also announced their intention to donate at least 100 million doses in 2021. However, because COVAX is unable to provide full vaccine coverage, additional bilateral and regional vaccine initiatives are necessary. In January, the African Union came together to secure 270 million doses on top of COVAX allocations to its member states. Australia has committed $500 million over three years to facilitate vaccinations in Southeast Asia and the Pacific. The Quad—the United States, Australia, Japan, and India—announced an initiative to provide 1 billion doses in partnership with India’s Biological E and other manufacturers by the end of 2022, in addition to supporting in-country delivery. However, with India facing a severe outbreak, the international community must also consider diversifying investments in global manufacturing capacity instead of relying on India for global Covid-19 vaccine manufacturing.

RUSSIA'S AND CHINA'S EFFORTS
As the United States reasserts itself as a leader on the global stage, its vaccine distribution efforts will inevitably be compared to those of China and Russia, both of which have already gotten a head start on “vaccine diplomacy,” which the National Institutes of Health (NIH) defines as “the branch of global health diplomacy that relies on the use or delivery of vaccines.” Since the early days of her nomination as USAID administrator, Samantha Power has called for U.S. leadership on supporting global Covid-19 vaccinations, writing, “The United States has a singular capacity to help countries with their strategies for administering a vaccine.” This sentiment was further underscored in her March confirmation hearing, where she emphasized her willingness to coordinate global, equitable vaccine delivery. China has donated vaccines to nearly 90 developing countries, the impact of which can already be seen. Morocco is currently leading domestic vaccine rollout in Africa, and most of its vaccines have come from China. However, China’s two most widely distributed vaccines, Sinovac and Sinopharm, were only approved by WHO for emergency use,
as they just barely meet its recommended efficacy threshold. Nonetheless, Beijing appears to see vaccine diplomacy as a way to extract political gain, especially in Latin America—for instance, the Financial Times reports that Paraguay was compelled to renege on recognition of Taiwan in exchange for vaccines.

Although there was initially some mistrust surrounding Russia’s Sputnik V vaccine, it has proven to be relatively effective in combating Covid-19. Russia has, however, faced difficulties with the actual production, casting its ability to fulfill existing purchase promises into doubt—especially as falling behind on these promises could further deepen the profound gap between global demand and lagging supply. Nevertheless, doses of Sputnik V have begun to be administered, with 70 countries receiving the vaccines as of May 2021. These developments have made clear the intentions of Russian vaccine diplomacy, with some analysts linking increased political turmoil in Eastern Europe to Russian vaccine purchases. Moscow’s vaccine diplomacy efforts have primarily utilized purchase contracts; unlike China, Russia has not donated doses. By contrast, the United States has primarily focused on donations, which serves as a beneficial step to help jumpstart efforts to respond to Chinese and Russian vaccine diplomacy. Currently, the United States has committed to donating 500 million doses—the most of any country, followed by France at 30 million doses and China at 15.2 million doses.

### COVID-19 Vaccine Dose Donations as of May 21, 2021

<table>
<thead>
<tr>
<th>Country</th>
<th>Doses</th>
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<tbody>
<tr>
<td>US</td>
<td>80M</td>
</tr>
<tr>
<td>France</td>
<td>30M</td>
</tr>
<tr>
<td>China</td>
<td>15.2M</td>
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<tr>
<td>India</td>
<td>10.2M</td>
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<tr>
<td>New Zealand</td>
<td>1.6M</td>
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<tr>
<td>MTN Group/African Union</td>
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</tr>
<tr>
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<tr>
<td>Portugal</td>
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<tr>
<td>Norway</td>
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<tr>
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<tr>
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<td>200K</td>
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<tr>
<td>Russia</td>
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<tr>
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<tr>
<td>Chile</td>
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<tr>
<td>Australia</td>
<td>8K</td>
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</tbody>
</table>

NOTE: Donations includes both donations made bilaterally and through COVAX, as well as donations that have been confirmed as delivered and donation pledges. France recently announced it would donate at least 30 million doses, however, it is unclear whether this total will include or exclude France’s previous donations.

SOURCE: UNICEF COVID-19 Vaccine Market Dashboard; Gavi; POLITICO; Development Today; Reuters • PNG

Building upon Existing Supply Chains to Meet the Need of Populations

With viable and safe vaccines available and production increasing, the international community should now quickly scale up supply chains—including to the last-mile distribution points where in-country populations will receive their injections. To speed up distribution, this should rely as much as possible on existing supply chains that are efficient and resilient. More than six months after the public began receiving Covid-19 vaccines, predictions suggest that it may take until at least 2023 to vaccinate enough of the global population to reach herd immunity, with some of the most vulnerable people last in line. Recent, unexpected delays in vaccine production may further complicate this timeline, with the impacts being felt most acutely in low- and middle-income countries.

International policymakers and leaders need to work with the private sector and civil society to think critically about strategies for both using existing supply chains and health service delivery platforms in LMICs and ensuring that newly developed supply chains, which might include partnerships between the public and private sector, can support a comprehensive vaccine rollout. It will be necessary to incorporate a broad understanding of health systems—and supply chains specifically—when designing policy. Vaccine supply chains should not only consider the physical movement of products but also the creation of doses, the capture and sharing of accurate data, relevant national-level regulation, and allocating doses for the greatest public health impact.

Supporting essential workers in their cross-border movements will be vital. As new strains and outbreaks emerge, the private sector continues to experience disruptions related to changing standards for quarantine and testing in ports around the world. It is essential that countries work more quickly to adopt protocols for cargo crew that both support health goals and facilitate the movement of goods. There are many best practices from which countries can learn, most notably models that provide cargo crew with a comfortable, closed-circuit environment upon landing. Given that the global supply chain is overwhelmingly dependent on this workforce for access to essential goods, the issues related to their movement will continue to require all due attention.

PHYSICAL SUPPLY OF VACCINES

Though 13.6 billion doses have been secured—enough to cover the global population—most have yet to be produced. A variety of factors have hindered delivery to LMICs. These doses are not spread evenly across the global population, with high-income countries securing a substantially larger proportion of global Covid-19 vaccines relative to their populations than LMICs. Possible instances of “vaccine nationalism” by high-income nations, such as the U.S. protection of necessary raw materials under the DPA, have also contributed to manufacturing bottlenecks. Concentration of vaccine production among a select number of manufacturers has left the global supply chain vulnerable to shocks and delays, as seen with the Serum Institute of India, which is struggling to deliver the 1.1 billion doses of AstraZeneca (Covishield) and Novavax it had pledged to COVAX. Due to the complex set of factors contributing to vaccine manufacturing problems, there are multiple strategies to overcome vaccine supply issues.

Providing financing for vaccine procurement will not guarantee their fast delivery, so WHO now suggests that countries focus on providing doses directly to LMICs. An obvious way to do this is to distribute surplus vaccine supply to other countries. New Zealand, Sweden, and France have taken steps to do so through multilateral frameworks like COVAX. Others, including the United States, have elected to donate additional vaccines beyond their COVAX commitments through bilateral agreements. While world leaders’ recent amenability to sharing vaccine doses is a step in the right direction, more needs to be done to supply excess production to other countries. Furthermore, within the United States, donating vaccines before all
Americans are vaccinated poses a political problem for the Biden-Harris administration. Calls to do so are increasing, however, and the administration should consider moving more rapidly to share surplus doses, especially since the most at-risk groups have mostly been vaccinated.

**NATIONAL-LEVEL GOVERNANCE CHALLENGES**

Supply chain issues do not stop at the production or procurement levels. After Covid-19 vaccines are created, they face a variety of country-level regulatory obstacles, especially in adapting to and working within preexisting customs structures, healthcare systems, information systems, and security challenges.

LMICs typically have less-efficient customs clearance processes, making it difficult to quickly move vaccines across borders. Furthermore, corruption often arises in customs regimes, further threatening and slowing equitable vaccine delivery. While institutions like WHO and the World Trade Organization (WTO) have published guidance for customs agencies to effectively prepare for the delivery of vaccines, greater technical assistance is needed, especially as many LMICs begin to receive doses. Learning from rollout elsewhere, these countries could pay specific attention to harnessing digital tools, ensuring in-country traceability of vaccines, and investing in early coordination among domestic institutions. There are also confirmed cases of counterfeit Pfizer-BioNTech vaccines, including in Mexico and Poland, validating earlier warnings by WHO about the risk of fake vaccines. Although pharmaceutical companies vigorously investigate cases of counterfeiting, enforcement can be difficult in developing countries that suffer from corruption and underfunded justice systems. The proliferation of counterfeit vaccines could potentially worsen vaccine hesitancy.

Fragile health systems and cumbersome regulations have further exacerbated vaccine delivery problems in LMICs. Many also face challenges in coordinating between the parallel public-sector, private-sector, and nongovernmental actors that provide health services for citizens. (Actors such as USAID can help overcome these hurdles by leveraging its many existing partnerships with local nongovernmental organizations [NGOs] through PEPFAR.) Even before the pandemic, public health systems in LMICs faced capacity challenges that further constrained their ability to implement nationwide vaccination campaigns. Differences in health system capacity among LMICs has already affected Covid-19 vaccine rollout. For instance, Rwanda, which has a relatively strong health system, has distributed 95 percent of delivered vaccines; Cote d’Ivoire, on the other hand, only distributed 10 percent of its received doses over the same time period. While it is unrealistic to dramatically improve LMICs’ entire health systems in time for Covid-19 vaccine rollout, it is critical for policymakers to determine where support is most needed to ensure that any doses delivered are distributed quickly and effectively to priority populations according to national vaccination plans. Vaccines themselves are not sufficient. The administration of each dose requires various ancillary items such as glass vials, personal protective equipment, syringes, and needle disposal. In the United States, the Department of Health and Human Services (HHS) ensured that each shipment of vaccines was accompanied by kits with ancillary supplies. A similar approach for global distribution programs like COVAX would help ensure that delivered vaccines can be administered.

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LAST-MILE DELIVERY
The final stage of the supply chain, last-mile delivery, bears some of the most pressing and complicated challenges. Last-mile delivery covers the actual distribution of doses to individuals—“shots into arms”—after they receive country-level clearance. Countries face a variety of challenges based on their specific contexts, but many common problems arise from weak internal infrastructure and logistics networks that make it difficult to reach the most vulnerable populations. The distribution of Covid-19 vaccines faces numerous challenges for delivering shots into arms, including stringent storage and transportation requirements, limited in-country crisis-planning capacities, populations’ variable access to health services, fluctuating demand for health services, scarcity of trained health workers, poor communication infrastructure, and communities’ unpredictable demand due to vaccine hesitancy and lack of awareness.

The Covid-19 vaccines are complex products that require significant storage infrastructure. Two of the more widely used vaccines, Moderna and Pfizer-BioNTech, require strict low-temperature storage and delivery to maintain their effectiveness. Cold-chain storage technology, which utilizes a variety of tools such as transportable freezers, is crucial to ensuring that doses are not wasted. Many LMICs do not have strong cold-chain or cold-storage systems. Currently, 3 billion people live in areas where there is not a reliable electricity grid—let alone enough temperature-controlled storage to hold Covid-19 vaccines. In addition, vaccines themselves do not have long shelf lives, requiring countries to move quickly. Hampered by lower technical capacity and more challenging logistics networks, some LMICs have already had to throw away doses, with Malawi and South Sudan discarding a combined 75,000 doses upon expiration in April. To prevent further waste, it will be necessary for policymakers to think critically about innovations to help deliver shots into arms. Early examples include building on cold-chain technology developed during recent Ebola outbreaks and leveraging community health worker platforms already involved in routine immunization campaigns.

The limited supply of Covid-19 vaccines also forces tough decisions regarding population prioritization. Following international public health guidance, mainly WHO recommendations, many governments have prioritized health workers, the elderly, and people with possible comorbidities, but more needs to be done to provide vaccinations for vulnerable populations that may be difficult to reach, including refugees and internally displaced persons. Jordan, partnering with multilateral organizations, has demonstrated significant leadership in this regard, and other LMICs facing similar challenges could draw upon its experiences.

EXPANDED ROLE OF THE PRIVATE SECTOR
Local private-sector actors have catalytic potential to deliver shots into arms. They often have strong in-country delivery networks and have built trust with local communities by providing critical services. In Nigeria, the private sector has already offered to loan cold-chain refrigerators to the government for temperature-sensitive vaccines, allowing the country to bypass possible challenges in procuring new supplies. Private healthcare providers within LMICs can also provide critical workforce supply, local knowledge, and preexisting clinics to distribute vaccines quickly. In Colombia, the company Farmalisto has partnered with the government to distribute 29,000 vaccines monthly, and in the United States, private pharmacies with far-ranging reach have played a critical role in vaccine distribution. Furthermore, governments exploring new ways to track the mass delivery of vaccines have an opportunity to work with the private technology sector.

Beyond direct delivery of vaccines, the private sector—together with civil society—can play a significant role in bolstering vaccine demand. The private sector has unique marketing knowledge and channels of
communications that the government may be unable to utilize without partnership. In the Philippines, private-sector communications specialists have partnered with the government to ensure that messaging on the benefits of vaccines is effective. Google has also provided assistance by widely distributing credible vaccine information through advertisement credits. In addition, private-sector actors can decrease certain barriers to access, especially for traditionally marginalized communities. For those who may struggle to reach vaccine locations in the United States, the government has partnered with ride-share companies Uber and Lyft to provide free rides to and from vaccination sites. In Indonesia, the government allowed private companies to support its non-subsidized Covid-19 vaccination program to increase access.

Successful vaccine distribution will also require partnerships with the private sector to ensure adequate production. As with other aspects of vaccine supply distribution, the Biden administration should apply lessons learned from successful domestic public-private partnerships to its global efforts. Operation Warp Speed (OWS), for example, effectively involved the Pentagon, the NIH, and seven pharmaceutical and biotechnology companies to safely distribute as many Covid-19 vaccines as possible in the shortest timeframe. The partnership has showcased efficiency in production and distribution while also adhering to sound science and making use of cutting-edge technologies. Furthermore, and arguably most importantly, OWS was able to cut through the “red tape” and provide a can-do approach to ending the pandemic.

In the short term, the private sector will be critical in addressing raw-material bottlenecks for vaccine production and for their ancillary products. Some have blamed the DPA for preventing critical raw vaccine materials from reaching manufacturers abroad—such as Novavax, which has agreed to provide COVAX 1.1 billion doses through the Serum Institute of India. The administration should immediately clarify whether the DPA prevents the export of raw vaccine materials. If it does, the administration should take steps to revise the act and use it to help increase the manufacturing of vaccines for delivery overseas.

Technology transfers will also be fundamental to increasing global Covid-19 vaccin production, with the private sector agreeing to suspend intellectual property rights for subcontractors. Already, AstraZeneca and Johnson & Johnson (with the help of Merck) have shown leadership by reaching agreements with subcontractors in India and South Africa to produce their vaccines. More companies could and should follow suit. In addition, the Biden-Harris administration announced in May that it would support a waiver on intellectual property requirements for Covid-19 vaccines. In the short and medium term, this will not yield an enormous increase in available vaccines because of the high cost of building new manufacturing facilities and the time needed to master vaccine production. Even before the pandemic, vaccine production was relatively concentrated in a few regions, thus many countries currently in need lack a sound foundation to manufacture their own. Private-sector capital can fill this gap. Already, companies like Themo-Fisher are investing in mRNA vaccine production, and existing health product manufacturers in LMICs have expressed interest in expanding their capabilities. The private sector could also rally technology transfer efforts through multilateral mechanisms such as WHO’s Covid-19 Technology Access Pool (C-TAP). While the initiative has struggled to convince vaccine producers to join, the Independent Panel for Pandemic Preparedness and Response has suggested this initiative should continue to lay the groundwork for future technology transfers on a larger scale.

**Recommendations**

The Biden-Harris administration should move quickly to increase vaccine distribution to LMICs. Beyond protecting Americans, this demonstration of leadership is both a moral and foreign policy imperative and integral to global health security. As the recent example of India shows, slow vaccine rollouts can easily be overwhelmed by a still potent global pandemic. The administration should draw on the growing U.S.
surplus of vaccine doses and the country’s manufacturing capabilities to get vaccines to the countries most in need. Such a significant logistical undertaking will require the administration to articulate a clear strategy to control the spread and impact of Covid-19 in the absence of vaccines. Given that even under the most optimistic scenarios most LMICs will not have vaccines widely available until 2022, it is necessary to have a non-vaccine strategy to enable countries to withstand Covid-19 resurgences by enhancing diagnostic capabilities and strengthening health systems.

The first steps toward making Covid-19 vaccine supply chains more effective are to catalogue lessons learned from ongoing global health initiatives and channel the delivery of Covid-19 vaccines through existing in-country structures. Working through existing programs offers a variety of advantages, particularly increased efficiency. By using these delivery platforms, fewer trial-and-error efforts are needed, as potential bottlenecks have likely already been addressed. Furthermore, working through these initiatives can take advantage of preexisting trust in their services, which can help build vaccine confidence. Partnering with highly-trusted local health professionals and community leaders—a strategy that has been successful in the United States—can ensure quicker vaccine uptake and prevent wasted supply.

The bipartisan Global Health Security Act of 2021 (H.R. 391), introduced in January, provides a foundation to further align U.S. global health policy with the implementation of the multilateral Global Health Security Agenda. President Biden’s FY 2022 budget also features substantial increases in global health spending, including an additional $800 million for global health security. Ongoing initiatives such as PEPFAR and the President’s Malaria Initiative have substantial reach in many LMICs and robust experience in delivering health commodities to remote areas. Looking beyond bilateral initiatives, it will also be helpful to generate momentum to work more closely with regional health organizations—such as the Africa Centers for Disease Control and Prevention (Africa CDC) or the Pan American Health Organization—to better understand how regional health systems and supply chains distribute vaccines once procured. NGOs, host countries, and multilateral organizations (like UNICEF) that support large-scale immunization programs also have critical on-the-ground knowledge, and any in-country coordination efforts should work to elevate their perspectives.

The Biden-Harris administration should take the following steps to ensure that vaccines are distributed equitably, efficiently, and effectively around the world:

**First,** the United States should leverage existing multilateral architecture, particularly COVAX and regional development banks, to broaden global inoculation capacities, strengthen vaccine supply chains, and expand existing health service delivery platforms.

- COVAX is a critical part of a successful global vaccination campaign. It has unique advantages in procuring vaccines for LMICs and should continue to serve in this role as the pandemic continues. It has also recently expanded initiatives to coordinate vaccine donations, and WHO director-general Tedros Adhanom Ghebreyesus has implored richer countries to share their surplus doses with LMICs (through COVAX) before vaccinating children. While domestic pressure might prevent some countries from following through with this, COVAX has started to distribute donated vaccines. For instance, France has committed to donating 500,000 doses to COVAX by mid-June, 31,200 of which arrived in Mauritania by late April. Though the United States intends to share vaccine doses abroad, it has yet to announce exactly where and when these doses will be sent. Once it does, the United States should consider striking a balance between donations to COVAX and more targeted bilateral donations.
Second, where multilateral mechanisms are absent or ineffective, the United States should be prepared and willing to take decisive bilateral action, especially considering the relative success of domestic rollout and likely surplus of doses as domestic demand lessens.

- Ideally, such efforts would complement and strengthen existing multilateral efforts and leverage existing U.S. platforms to ensure timely response and action. These efforts could include assisting in vaccine readiness, easing supply chain bottlenecks, directly donating vaccines, and supporting in-country vaccine distribution—such as by amending customs clearance procedures, ensuring adequate transportation and storage (particularly ultra-cold and cold-chain requirements), and aiding last-mile distribution and targeted vaccination efforts by launching campaigns to bolster national vaccination confidence.

- To effectively counter the spread of Covid-19 around the world, the United States should focus bilateral efforts on countries where the risk is greatest, especially the origin points of new variants. Such a strategy is within the interest of the United States, as the emergence of a vaccine-resistant strain would devastate global vaccination efforts. Intensifying bilateral support, as the United States is now doing for India, helps to stop the spread of variants at the source. These efforts should in part build upon existing bilateral support to countries—such as through USAID, which can leverage its massive health and other foreign assistance platforms.

- Donating bilaterally and multilaterally can help fulfill public health and political interests. Multilateral efforts such as COVAX have demonstrated substantial success in procuring vaccines while supporting President Biden’s larger mission of renewing U.S. leadership on the international stage and increasing U.S. participation in multilateral mechanisms. Meanwhile, U.S. bilateral assistance could help tackle major supply chain bottlenecks and avoid duplication of efforts. Bilateral donations can be mobilized quickly to address acute crises when they arise and further strengthen relationships with allies such as Canada and Mexico.

- In addition to COVAX, multilateral development banks have made substantial commitments to support global vaccine rollout. The World Bank has approved $2 billion in financing for 17 countries, part of a larger $12 billion package to help countries purchase and distribute vaccines over 24 months. Similarly, the Asian Development Bank launched the $9 billion Asia Pacific Vaccine Access Facility in December 2020. On top of $1 billion in financing, the Inter-American Development Bank has also announced a new initiative focused on helping countries negotiate with vaccine producers. As the pandemic worsens, especially for LMICs, it will be necessary to free up these financial commitments and quickly transform them into concrete distribution programs. Furthermore, switching priorities from supporting both distribution and procurement to strengthening in-country vaccine distribution systems could improve resilience for the next pandemic, mitigate new challenges such as expiring vaccine supply in LMICs, and bypass difficult procurement systems that may have deterred countries from seeking multilateral assistance.

Third, the U.S. government and its partners cannot solve the vaccine distribution challenge alone. Strong public–private partnerships can help fill the gap, drawing on the unique strengths of global logistics companies to overcome existing barriers.

- Strong public–private partnerships will be necessary to achieve the kind of scale required to distribute vaccines to the entire world. Rather than compete, governments and private-sector actors should have a synchronized partnership that views the private sector as more than just a vehicle to
deliver an outcome. In particular, governments could tap into the recognized and field-tested expertise global logistics companies have in delivering products from one location to another. For instance, United Parcel Service (UPS) has set a goal of delivering 3 billion vaccines by the end of the year and has already distributed vaccines to over 50 countries. Many of these companies know how to deliver vaccines but often find themselves waiting for governments to implement associated policies, such as to ensure customs processes run smoothly. In early June, Mastercard also announced it would spend $1.3 billion over three years to improve vaccine delivery and manufacturing in Africa through a partnership with Africa CDC.

- Private companies play an important role in supporting the vaccine supply chain beyond distribution and supply. Employee vaccination programs are one important way to address vaccine hesitancy and increase access to the vaccine. Public–private partnerships also provide essential services for scheduling vaccines, recording vaccination status, and tracking distribution. For example, Microsoft’s EY Vaccine Management Solution helps track the manufacture, distribution, and procurement of vaccines.

Fourth, outmoded and rigid policies that constrain vaccine delivery should be revised to ensure that the currently limited supply of vaccines will be able to stretch as far as possible.

- Due to the global nature of the crisis and the direct threat of developing variants, it is in the United States’ interest to support vaccine distribution in the rest of the world, particularly by resolving existing policy impediments. For example, customs protocols need to ensure that vaccines are properly delivered, perhaps through targeted—or even universal—waivers for medical supplies. Given that delivery of vaccines is expected to remain urgent well into 2022, it is essential that governments implement additional customs best practices, including upgrading their use of digital tools, to avoid future disruptions. Transparency within procurement and delivery will also help speed up processes.

- A crisis on the global scale of Covid-19 requires resources on a global scale, so governments should encourage private-sector innovations. While the U.S. government can take the lead in determining how to prioritize vaccine distribution, which it has successfully completed domestically, more thinking needs to be done on how to make the limited supply of vaccines stretch as far as possible. Patient age and comorbidity are important but should not be the only considerations; it is also necessary to look at where the outbreaks are worst and where health systems are weakest.

Fifth, the United States should adopt a whole-of-government approach that takes full advantage of its technical and institutional capacities. The United States can lead the global response to the challenges of Covid-19 through cooperation among USAID, the Department of State, the Department of the Treasury, HHS, the CDC, and PEPFAR, as well as through public–private engagement through the U.S. International Development Finance Corporation and the Millennium Challenge Corporation.

- Since January, the Biden-Harris administration has made key appointments to ensure that the various government agencies involved in the U.S. global response to Covid-19 are working together. This includes naming former USAID administrator Gayle Smith as the global Covid-19 and health security coordinator at the Department of State and Elizabeth Cameron as the senior director for global health security and biodefense at the National Security Council. In addition, the Biden-Harris administration appointed senior coordinators at USAID and HHS to support the global response. While these appointments reflect a clearly stated desire to provide global leadership in combating Covid-19, there is a risk of responsibilities overlapping, with no clear single point of leadership. The administration
should ensure that its own structures and processes do not provide an additional roadblock to distributing vaccines effectively and efficiently around the world.

- **USAID and the Department of State** have a clear role to play in the global pandemic response. With USAID's local knowledge and substantial experience in the global health field, it could better harness staff expertise to support Covid-19–specific bilateral initiatives. For example, in partnership with COVAX, Gavi, and the Global Fund, USAID has already launched a supply-chain program called STEP 2.0 that will train public-sector health leaders in best practices learned from the private sector and support medical supply chains in LMICs. This program works in tandem with USAID's Global Health Supply Chain Program (GHSC). To further safeguard health supply chains in developing countries, GHSC provides medical technology, pharmaceutical services, procurement and supply management, rapid test kits, quality assurance, and business intelligence and analytics. In addition, in a strong demonstration of U.S. commitment to a multilateral Covid-19 vaccine response, the Department of State and USAID partnered with Gavi to host “One World Protected” in April, which launched a drive for greater investment in COVAX.

- The United States can also draw upon ongoing bilateral global health initiatives such as PEPFAR, the President’s Malaria Initiative, USAID's Neglected Tropical Disease Program, and ongoing USAID initiatives to support routine vaccinations. Many of these programs already have existing relationships with ministries of health or local health providers, providing an important foundation for trust and coordination. Furthermore, many of these programs also have experience in directly delivering a variety of medical commodities to populations in need, a major challenge currently hindering the Covid-19 vaccine campaign.

Finally, a successful domestic and global vaccination campaign will require the support and integration of local and grassroots actors, such as community organizations, churches, health-focused civil society organizations, and several PEPFAR partners. Host governments should lead (or work hand-in-hand with multilateral and bilateral donors) but still incorporate the perspectives of local stakeholders, which are invaluable for understanding current healthcare systems and conducting effective community outreach and advocacy.

- **Local perspectives** are invaluable in understanding existing healthcare systems and ensuring that doses are being distributed to vulnerable populations. Local actors will also better understand how to conduct outreach campaigns to address any vaccine hesitancy and educate communities on how to get vaccinated. By working with local leaders, public health officials can dispel disinformation and increase community trust in the vaccines—which is critically important to ensure herd immunity. Within the United States, local religious leaders have played a critical role in setting vaccination examples. In addition, local leaders can also fulfill an important public health monitoring role by reporting vaccine information, as they often have deeper roots and greater access to community members.

- It is equally important to ensure that local actors build their capacities. During the Ebola crisis, there were initial signs that the international community was going to strengthen global healthcare systems to deal with the next pandemic, but these concerns were soon forgotten. Building up local capacities now—as a part of the Covid-19 response—will play a significant role in adapting to future pandemics as well.
Beyond public health and moral considerations, there are clear reasons for the United States to support greater bilateral assistance for Covid-19 vaccinations. For one, while many high-income countries are battling worsening pandemic conditions and slow vaccine rollouts, the United States has an opportunity to consciously set global standards for future public health crises and to illustrate what greater international engagement will look like under the Biden-Harris administration. The United States should also push back against authoritarian-leaning countries like Russia and China, who are relying on distributing their own vaccines to seek greater influence abroad. The United States will have to move quickly, especially considering that Russia and China began engaging in vaccine diplomacy much earlier and with much greater intent; already, reports have emerged that China has pressured countries it gave vaccines to formally recognize China’s claim over Taiwan. However, with a more effective slate of vaccines on hand, renewed political will, and legitimacy stemming from a successful domestic rollout, the Biden-Harris administration a has unique opportunity to provide critical access to vaccines to its partners across the world.

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