



FOREIGN AFFAIRS

The Tragedy of Vaccine Nationalism

Only Cooperation Can End the Pandemic

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September/October 2020

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Trump administration officials have compared the global allocation of vaccines against the coronavirus that causes COVID-19 to oxygen masks dropping inside a depressurizing airplane. “You put on your own first, and then we want to help others as quickly as possible,” Peter Marks, a senior official at the U.S. Food and Drug Administration who oversaw the initial phases of vaccine development for the U.S. government, said during a panel discussion in June. The major difference, of course, is that airplane oxygen masks do not drop only in first class—which is the equivalent of what will happen when vaccines eventually become available if governments delay providing access to them to people in other countries.

By early July, there were 160 candidate vaccines against the new coronavirus in development, with 21 in clinical trials. Although it will be months, at least, before one or more of those candidates has been proved to be safe and effective and is ready to be delivered, countries that manufacture vaccines (and wealthy ones that do not) are already competing to lock in early access. And to judge from the way governments have acted during the current pandemic and past outbreaks, it seems highly likely that such behavior will persist. Absent an international, enforceable commitment to distribute vaccines globally in an equitable and rational way, leaders will instead prioritize taking care of their own populations over slowing the spread of COVID-19 elsewhere or helping protect essential health-care workers and highly vulnerable populations in other countries.

That sort of “vaccine nationalism,” or a “my country first” approach to allocation, will have profound and far-reaching consequences. Without global coordination, countries may bid against one another, driving up the price of vaccines and related materials. Supplies of proven vaccines will be limited initially even in some rich countries, but the greatest suffering will be in low- and middle-income countries. Such places will be forced to watch as their wealthier counterparts deplete supplies and will have to wait months (or longer) for their replenishment. In the interim, health-care workers and billions of elderly and other high-risk inhabitants in poorer countries will go unprotected, which will extend the pandemic, increase its death toll, and imperil already fragile health-care systems and economies. In their quest to obtain vaccines, countries without access to the initial stock will search for any form of leverage they can find, including blocking exports of critical vaccine components, which will lead to the breakdown of supply chains for raw ingredients, syringes, and vials. Desperate governments may also strike short-term deals for vaccines with adverse consequences for their long-term economic, diplomatic, and strategic interests. The result will be not only

needless economic and humanitarian hardship but also intense resentment against vaccine-hoarding countries, which will imperil the kind of international cooperation that will be necessary to tackle future outbreaks—not to mention other pressing challenges, such as climate change and nuclear proliferation.

It is not too late for global cooperation to prevail over global dysfunction, but it will require states and their political leaders to change course.

What the world needs is an enforceable COVID-19 vaccine trade and investment agreement that would alleviate the fears of leaders in vaccine-producing countries, who worry that sharing their output would make it harder to look after their own populations. Such an agreement could be forged and fostered by existing institutions and systems. And it would not require any novel enforcement mechanisms: the dynamics of vaccine manufacturing and global trade generally create layers of interdependence, which would encourage participants to live up to their commitments. What it would require, however, is leadership on the part of a majority of vaccine-manufacturing countries—including, ideally, the United States.

WINNERS AND LOSERS

The goal of a vaccine is to raise an immune response so that when a vaccinated person is exposed to the virus, the immune system takes control of the pathogen and the person does not get infected or sick. The vaccine candidates against COVID-19 must be proved to be safe and effective first in animal studies, then in small trials in healthy volunteers, and finally in large trials in representative groups of people, including the elderly, the sick, and the young.

Most of the candidates currently in the pipeline will fail. If one or more vaccines are proved to be safe and effective at preventing infection and a large enough share of a population gets vaccinated, the number of susceptible individuals will fall to the point where the coronavirus will

not be able to spread. That population-wide protection, or “herd immunity,” would benefit everyone, whether vaccinated or not.

It is not clear yet whether achieving herd immunity will be possible with this coronavirus. A COVID-19 vaccine may prove to be more like the vaccines that protect against influenza: a critical public health tool that reduces the risk of contracting the disease, experiencing its most severe symptoms, and dying from it, but that does not completely prevent the spread of the virus. Nevertheless, given the potential of vaccines to end or contain the most deadly pandemic in a century, world leaders as varied as French President Emmanuel Macron, Chinese President Xi Jinping, and UN Secretary-General António Guterres have referred to them as global public goods—a resource to be made available to all, with the use of a vaccine in one country not interfering with its use in another.

At least initially, however, that will not be the reality. During the period when global supplies of COVID-19 vaccines remain limited, providing them to some people will necessarily delay access for others. That bottleneck will prevent any vaccine from becoming a truly global public good.

Vaccine manufacturing is an expensive, complex process, in which even subtle changes may alter the purity, safety, or efficacy of the final product. That is why regulators license not just the finished vaccine but each stage of production and each facility where it occurs. Making a vaccine involves purifying raw ingredients; formulating and adding stabilizers, preservatives, and adjuvants (substances that increase the immune response); and packaging doses into vials or syringes. A few dozen companies all over the world can carry out that last step, known as “fill and finish.” And far fewer can handle the quality-controlled manufacture of active ingredients—especially for more novel, sophisticated vaccines, whose production has been dominated historically by just four large multinational firms based in the United States, the United Kingdom, and

the European Union. Roughly a dozen other companies now have some ability to manufacture such vaccines at scale, including a few large outfits, such as the Serum Institute of India, the world's largest producer of vaccines. But most are small manufacturers that would be unable to produce billions of doses.

Further complicating the picture is that some of today's leading COVID-19 vaccine candidates are based on emerging technologies that have never before been licensed. Scaling up production and ensuring timely approvals for these novel vaccines will be challenging, even for rich countries with experienced regulators. All of this suggests that the manufacture of COVID-19 vaccines will be limited to a handful of countries.

And even after vaccines are ready, a number of factors might delay their availability to nonmanufacturing states. Authorities in producing countries might insist on vaccinating large numbers of people in their own populations before sharing a vaccine with other countries. There might also turn out to be technical limits on the volume of doses and related vaccine materials that companies can produce each day. And poor countries might not have adequate systems to deliver and administer whatever vaccines they do manage to get.

During that inevitable period of delay, there will be many losers, especially poorer countries. But some rich countries will suffer, too, including those that sought to develop and manufacture their own vaccines but bet exclusively on the wrong candidates. By rejecting cooperation with others, those countries will have gambled their national health on hyped views of their own exceptionalism.

And even "winning" countries will needlessly suffer in the absence of an enforceable scheme to share proven vaccines. If health systems collapse under the strain of the pandemic and foreign consumers are ill or dying,

there will be less global demand for export-dependent industries in rich countries, such as aircraft or automobiles. If foreign workers are under lockdown and cannot do their jobs, cross-border supply chains will be disrupted, and even countries with vaccine supplies will be deprived of the imported parts and services they need to keep their economies moving.

PAGING DR. HOBBS

Forecasts project that the coronavirus pandemic could kill 40 million people and reduce global economic output by \$12.5 trillion by the end of 2021. Ending this pandemic as soon as possible is in everyone's interest. Yet in most capitals, appeals for a global approach have gone unheeded.

In fact, the early months of the pandemic involved a decided shift in the wrong direction. In the face of global shortages, first China; then France, Germany, and the European Union; and finally the United States hoarded supplies of respirators, surgical masks, and gloves for their own hospital workers' use. Overall, more than 70 countries plus the European Union imposed export controls on local supplies of personal protective equipment, ventilators, or medicines during the first four months of the pandemic. That group includes most of the countries where potential COVID-19 vaccines are being manufactured.

Such hoarding is not new. A vaccine was developed in just seven months for the 2009 pandemic of the influenza A virus H1N1, also known as swine flu, which killed as many as 284,000 people globally. But wealthy countries bought up virtually all the supplies of the vaccine. After the World Health Organization appealed for donations, Australia, Canada, the United States, and six other countries agreed to share ten percent of their vaccines with poorer countries, but only after determining that their remaining supplies would be sufficient to meet domestic needs.

Nongovernmental and nonprofit organizations have adopted two limited strategies to reduce the risk of such vaccine nationalism in the case of COVID-19. First, CEPI (the Coalition for Epidemic Preparedness Innovations), the Bill & Melinda Gates Foundation, the nongovernmental vaccine partnership known as Gavi, and other donors have developed plans to shorten the queue for vaccines by investing early in the manufacturing and distribution capacity for promising candidates, even before their safety and efficacy have been established. The hope is that doing so will reduce delays in ramping up supplies in poor countries. This approach is sensible but competes with better-resourced national initiatives to pool scientific expertise and augment manufacturing capacity. What is more, shortening the queue in this manner may exclude middle-income countries such as Pakistan, South Africa, and most Latin American states, which do not meet the criteria for receiving donor assistance. It would also fail to address the fact that the governments of manufacturing countries might seize more vaccine stocks than they need, regardless of the suffering elsewhere.

An alternative approach is to try to eliminate the queue altogether. More than a dozen countries and philanthropies in initial pledges of \$8 billion to the Access to COVID-19 Tools (ACT) Accelerator, an initiative dedicated to the rapid development and equitable deployment of vaccines, therapeutics, and diagnostics for COVID-19. The ACT Accelerator, however, has so far failed to attract major vaccine-manufacturing states, including the United States and India. In the United States, the Trump administration has instead devoted nearly \$10 billion to Operation Warp Speed, a program designed to deliver hundreds of millions of COVID-19 vaccines by January 2021—but only to Americans. Meanwhile, Adar Poonawalla, the chief executive of the Serum Institute of India, has stated that “at least initially,” any vaccine the company produces will go to India’s 1.3 billion people. Other vaccine

developers have made similar statements, pledging that host governments or advanced purchasers will get the early doses if supplies are limited.

Given the lack of confidence that any cooperative effort would be able to overcome such obstacles, more and more countries have tried to secure their own supplies. France, Germany, Italy, and the Netherlands formed the Inclusive Vaccine Alliance to jointly negotiate with vaccine developers and producers. That alliance is now part of a larger European Commission effort to negotiate with manufacturers on behalf of EU member states to arrange for advance contracts and to reserve doses of promising candidates. In May, Xi told attendees at the World Health Assembly, the decision-making body of the World Health Organization, that if Beijing succeeds in developing a vaccine, it will share the results with the world, but he did not say when. In June, Anthony Fauci, the director of the U.S. National Institute of Allergy and Infectious Diseases, expressed skepticism about that claim and told *The Wall Street Journal* that he expects that the Chinese government will use its vaccines “predominantly for the very large populace of China.” This summer, the United States bought up virtually all the supplies of remdesivir, one of the first drugs proven to work against COVID-19, leaving none for the United Kingdom, the EU, or most of the rest of the world for three months.

LEARNING THE HARD WAY

Global cooperation on vaccine allocation would be the most efficient way to disrupt the spread of the virus. It would also spur economies, avoid supply chain disruptions, and prevent unnecessary geopolitical conflict. Yet if all other vaccine-manufacturing countries are being nationalists, no one will have an incentive to buck the trend. In this respect, vaccine allocation resembles the classic game theory problem known as “the prisoner’s dilemma”—and countries are very much acting like the proverbial prisoner.

“If we have learned anything from the coronavirus and swine flu H1N1 epidemic of 2009,” said Peter Navarro, the globalization skeptic whom President Donald Trump appointed in March to lead the U.S. supply chain response to COVID-19, “it is that we cannot necessarily depend on other countries, even close allies, to supply us with needed items, from face masks to vaccines.” Navarro has done his best to make sure everyone else learns this lesson, as well: shortly after he made that statement, the White House slapped export restrictions on U.S.-manufactured surgical masks, respirators, and gloves, including to many poor countries.

By failing to develop a plan to coordinate the mass manufacture and distribution of vaccines, many governments—including the U.S. government—are writing off the potential for global cooperation. Such cooperation remains possible, but it would require a large number of countries to make an enforceable commitment to sharing in order to overcome leaders’ fears of domestic opposition.

The time horizon for most political leaders is short, especially for those facing an imminent election. Many remain unconvinced that voters would understand that the long-term health and economic consequences of the coronavirus spreading unabated abroad are greater than the immediate threat posed by their or their loved ones’ having to wait to be vaccinated at home. And to politicians, the potential for opposition at home may seem like a bigger risk than outrage abroad over their hoarding supplies, especially if it is for a limited time and other countries are seen as likely to do the same.

Fortunately, there are ways to weaken this disincentive to cooperate. First, politicians might be more willing to forgo immunizing their entire populations in order to share vaccines with other countries if there were reliable research indicating the number and allocation of doses needed to

achieve critical public health objectives at home—such as protecting health-care workers, military personnel, and nursing home staffs; reducing the spread to the elderly and other vulnerable populations; and breaking transmission chains. Having that information would allow elected leaders to pledge to share vaccine supplies with other countries only if they have enough at home to reach those goals. This type of research has long been part of national planning for immunization campaigns. It has revealed, for example, that because influenza vaccines induce a relatively weak immune response in the elderly, older people are much better protected if the vaccination of children, who are the chief spreaders, is prioritized. Such research does not yet exist for COVID-19 but should be part of the expedited clinical trials that companies are currently conducting for vaccine candidates.

A framework agreement on vaccine sharing would also be more likely to succeed if it were undertaken through an established international forum and linked to preventing the export bans and seizures that have disrupted COVID-19-related medical supply chains. Baby steps toward such an agreement have already been taken by a working group of G-20 trade ministers, but that effort needs to be expanded to include public health officials. The result should be a COVID-19 vaccine trade and investment agreement, which should include an investment fund to purchase vaccines in advance and allocate them, once they have been proved to be safe and effective, on the basis of public health need rather than the size of any individual country's purse. Governments would pay into the investment fund on a subscription basis, with escalating, nonrefundable payments tied to the number of vaccine doses they secured and other milestones of progress. Participation of the poorest countries should be heavily subsidized or free. Such an agreement could leverage the international organizations that already exist for the purchase and distribution of vaccines and medications for HIV/AIDS, tuberculosis, and malaria. The agreement should include an enforceable commitment

on the part of participating countries to not place export restrictions on supplies of vaccines and related materials destined for other participating countries.

The agreement could stipulate that if a minimum number of vaccine-producing countries did not participate, it would not enter into force, reducing the risk to early signatories. Some manufacturers would be hesitant to submit to a global allocation plan unless the participating governments committed to indemnification, allowed the use of product liability insurance, or agreed to a capped injury-compensation program to mitigate the manufacturers' risk. Linking the agreement to existing networks of regulators, such as the International Coalition of Medicines Regulatory Authorities, might help ease such concerns and would also help create a more transparent pathway to the licensing of vaccines, instill global confidence, reduce development costs, and expedite access in less remunerative markets.

WHAT YOU DON'T KNOW CAN HURT (AND HELP) YOU

Even if policymakers can be convinced about the benefits of sharing, cooperation will remain a nonstarter if there is nothing to prevent countries from reneging on an agreement and seizing local supplies of a vaccine once it has been proved to be safe and effective. Cooperation will ensue only when countries are convinced that it can be enforced.

The key thing to understand is that allocating COVID-19 vaccines will not be a one-off experience: multiple safe and effective vaccines may eventually emerge, each with different strengths and benefits. If one country were to deny others access to an early vaccine, those other countries could be expected to reciprocate by withholding potentially more effective vaccines they might develop later. And game theory makes clear that, even for the most selfish players, incentives for cooperation improve when the game is repeated and players can credibly threaten quick and effective punishment for cheating.

Which vaccine turns out to be most effective may vary by the target patient population and setting. Some may be more suitable for children or for places with limited refrigeration. Yet because the various vaccine candidates still in development require different ingredients and different types of manufacturing facilities, no one country, not even the United States, will be able to build all the facilities that may later prove useful.

Today's vaccine supply chains are also unavoidably global. The country lucky enough to manufacture the first proven vaccine is unlikely to have all the inputs necessary to scale up and sustain production. For example, a number of vaccine candidates use the same adjuvant, a substance produced from a natural compound extracted from the Chilean soapbark tree. This compound comes mostly from Chile and is processed in Sweden. Although Chile and Sweden do not manufacture vaccines, they would be able to rely on their control of the limited supply of this input to ensure access to the eventual output. Vaccine supply chains abound with such situations. Because the science has not settled on which vaccine will work best, it is impossible to fully anticipate and thus prepare for all the needed inputs.

The Trump administration, as well as some in Congress, has blamed the United States' failure to produce vast supplies of everything it needs to respond to COVID-19 on "dependency." But when it comes to creating an enforceable international vaccine agreement, complex cross-border supply chains are a feature, not a bug. Even countries without vaccine-manufacturing capacity can credibly threaten to hold up input supplies to the United States or other vaccine-manufacturing countries if they engage in vaccine nationalism.

The Trump administration was reminded of this dynamic in April, when the president invoked the Defense Production Act and threatened to ban exports to Canada and Mexico of respirators made by 3M. Had Trump followed through, Canada could have retaliated by halting exports of

hospital-grade pulp that U.S. companies needed to produce surgical masks and gowns. Or Canada could have stopped Canadian nurses and hospital workers from crossing the border into Michigan, where they were desperately needed to treat American patients. Mexico, for its part, could have cut off the supply of motors and other components that U.S. companies needed to make ventilators. The White House seemed unaware of these potential vulnerabilities. Once it got up to speed, the administration backed off.

Of course, the Trump administration should have already learned that trading partners—even historical allies—are willing and able to swiftly and effectively retaliate against one another if someone breaks an agreement. In early 2018, this was apparently an unknown—at least to Navarro. Explaining why Trump was planning to put tariffs on steel and aluminum, Navarro reassured Americans: “I don’t believe there is any country in the world that is going to retaliate,” he declared. After Trump imposed the duties, Canada, Mexico, and the European Union, along with China, Russia, and Turkey, all immediately retaliated. The EU went through a similar learning experience in March. The European Commission originally imposed a broad set of export restrictions on personal protective equipment. It was forced to quickly scale them back after realizing that cutting off non-EU members, such as Norway and Switzerland, could imperil the flow of parts that companies based in the EU needed to supply the EU's own member states with medical supplies.

American and European policymakers now understand—or at least should understand—that what they don’t know about cross-border flows can hurt them. Paradoxically, this lack of information may help convince skeptical policymakers to maintain the interdependence needed to fight the pandemic. Not knowing what they don’t know reduces the risk that governments will renege on a deal tomorrow that is in their own best interest to sign on to today.

THE POWER OF FOMO

When the oxygen masks drop in a depressurizing plane, they drop at the same time in every part of the plane because time is of the essence and because that is the best way to ensure the safety of all onboard. The same is true of the global, equitable allocation of safe and effective vaccines against COVID-19.

Vaccine nationalism is not just morally and ethically reprehensible: it is contrary to every country's economic, strategic, and health interests. If rich, powerful countries choose that path, there will be no winners—ultimately, every country will be a loser. The world is not doomed to learn this the hard way, however. All the necessary tools exist to forge an agreement that would encourage cooperation and limit the appeal of shortsighted “my country first” approaches.

But time is running out: the closer the world gets to the day when the first proven vaccines emerge, the less time there is to set up an equitable, enforceable system for allocating them. As a first step, a coalition of political leaders from countries representing at least 50 percent of global vaccine-manufacturing capacity must get together and instruct their public health officials and trade ministers to get out of their silos and work together. Combining forces, they should hammer out a short-term agreement that articulates the conditions for sharing, including with the legions of poorer, nonmanufacturing countries, and makes clear what would happen to participants who subsequently reneged and undertook vaccine nationalism. Such a step would get the ball rolling and convince even more of the manufacturing countries to sign on. The fear of missing out on vaccine access, in the event their countries' own vaccine candidates fail, may be what it takes to pressure even today's most reluctant leaders to cooperate.