



THOMAS J. BOLLYKY

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 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

The Tragedy of Vaccine Nationalism

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 do

nations, 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, 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 made initial pledges of \$8 billion to the Access to COVID-19 Tools (

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 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

(.S.)0m(his)0-5 1c7 ET EMC /Span <</Lang (en-US)/MCID 4867 >>BDC

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

vestment 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, 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 co

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 forceieorken-USChamg (eoliti