



Invited Commentary | Global Health

Pandemic Vaccine Trials in Low- and Middle-Income Countries and Global Health Security

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During the COVID-19 pandemic, we have seen the best of international collective action and its limitations. COVID-19 vaccine development showed global cooperation at its finest. Multiple safe, highly effective vaccines were licensed in record time through an unprecedented collaborative effort. Chinese scientists shared the SARS-CoV-2 sequence on January 10, 2020, 63 days later the first human trial began in the US, and trials have been conducted or are ongoing in low-income countries (LICs), middle-income countries (MICs), and high-income countries (HICs). Unfortunately, when it came to sharing the fruits of this scientific enterprise, collective action fell woefully short.

Rich nations, and those that funded the clinical development of vaccines, used their power to enter into bilateral deals with vaccine manufacturers, leading to monopolization of the supply and hoarding of excess doses that sometimes have ended up being wasted. By the end of 2021, rich countries are on course to have 1 billion unused doses.¹ Australia, Canada, the European Union, New Zealand, and the United Kingdom have bought enough doses to vaccinate all their citizens 3 to 6 times over.² These countries are debating whether to provide a third dose, while most less wealthy nations still seek to secure their first.

When it comes to being able to buy doses, COVAX, a multilateral solidarity mechanism that promotes vaccine equity, “is still getting pushed to the back of the queue.”³ LICs and many MICs may not have the finances to buy doses directly themselves; even if they do, companies have sometimes charged them higher prices than what they charge rich countries. The result is a profound global inequity in access to vaccines. Across the US and Canada, 67% of people have had at least 1 dose, but the proportion across sub-Saharan Africa is just 7.7%.⁴ To redress this imbalance, more than 100 countries backed a proposal to temporarily waive intellectual property protection on COVID-19 technologies so that vaccine manufacturing can be globalized. However, waiver discussions at the World Trade Organization have been blocked by many rich nations and vaccine companies.

Ramachandran and colleagues⁵ now shine a spotlight on another form of COVID-19 vaccine inequity: when less wealthy nations conduct vaccine trials, this may not guarantee them access to the tested vaccine. In a cross-sectional study that—to our knowledge—is the first of its kind, the authors identified completed and ongoing trials and examined whether countries that tested a specific COVID-19 vaccine went on to authorize and have access to that vaccine.

The authors⁵ found 25 completed trials, 11 in HICs, 11 in upper MICs, and 3 in lower MICs (they found no completed trials in LICs). Authorization rates for the tested vaccine were high across all income groups—10 of the 11 HICs (90.9%), 10 of the 11 upper MICs (90.9%), and all 3 of the lower MICs (100.0%) that completed trials. Yet, HICs received proportionately more doses, receiving enough doses to vaccinate 51.7% of their population, compared with just 14.9% for upper MICs and 31.0% for lower MICs. When the authors examined completed and ongoing trials, they found 37 in total, including 18 in HICs, 12 in upper MICs, 6 in lower MICs, and 1 in a LIC. Among nations that had hosted such trials, they found that COVAX delivered a median of 15.4%, 48.8%, and 78.8% of procured doses of tested vaccines in LICs, lower MICs, and upper MICs, respectively.⁵

These are important findings. The Universal Declaration of Human Rights states that everyone has the right “to share in scientific advancement and its benefits.”⁶ This right is important to uphold when trials are conducted in LICs and MICs. Too often, trials conducted in less wealthy nations “result in treatments that the host community cannot afford and often cannot access for decades, even

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though *they* assumed the burdens.”⁷ From an ethical standpoint, the host community should be among the first to benefit from the trial. The findings of Ramachandran and colleagues⁵ are in line with other studies of the availability of new medical products after they have been trialed in HICs, MICs, and LICs, which have also found gaps between where drugs are tested worldwide and where they ultimately become available to patients.⁸

Nevertheless, giving preferential access to vaccines to nations that conduct trials could worsen inequity by rewarding only those nations that have clinical trials capacity. LICs without trial infrastructure could end up being further disadvantaged. This is one of many reasons why we believe that LICs and MICs should increase their own investments in designing and conducting trials, regulatory capacity, and manufacturing, thus becoming self-sufficient in making their own medical products. There was an understandable outcry when the multinational company Johnson & Johnson exported COVID-19 vaccine doses made in South Africa to heavily vaccinated European countries. By building their own infrastructure to test, regulate, manufacture, and distribute medical products, LICs and MICs would no longer be at the mercy of this kind of behavior by Big Pharma and the rich world.

Such increased investments by LICs and MICs would reap impressive health and economic returns. For example, Schäferhoff and colleagues⁹ modeled the benefits of MICs increasing their investments in developing and manufacturing therapeutics and vaccines for HIV, tuberculosis, malaria, pneumonia, and diarrheal diseases and becoming hubs for supplying regional markets. The public health and economic benefits would be enormous. For example, from 2021 to 2036, such increased investments in South Africa could prevent 5.2 million deaths and 254 million disability-adjusted life-years in the South African Development Community region; the regional economic returns would outweigh investments by a factor of 33.⁹

One challenge in globally rolling out COVID-19 vaccines tested in HICs is that there may be important epidemiological differences between countries, such as comorbidities, that could potentially influence vaccine effectiveness and adverse reactions. For example, South African research found that some immunocompromised patients, such as people living with HIV, struggle to clear SARS-CoV-2 and could become reservoirs for new variants.¹⁰ Trials of Sputnik V and Sinovac excluded people living with HIV, resulting in delays in registration of these vaccines in South Africa, which has a high burden of HIV. By doing their own trials, LICs and MICs can ensure that they test product candidates in their own populations, use locally generated data, and ensure local access to the products. In summary, greater sovereignty over trials in LICs and MICs would help ensure that everyone is made safer from pandemics.

ARTICLE INFORMATION

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