

COVID-19, monkeypox, and the need for vaccines in low- and middle-income countries

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Over the last two years, the world has faced the challenge and devastation that the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and its Coronavirus Disease 2019 (COVID-19) pandemic has imposed,^[1] especially to low- and middle-income countries (LMIC) including those from Latin America, as is the case of Colombia.^[2]

The COVID-19 pandemic has not ceased. However, in August 2022, the circulation is considered low. Although SARS-CoV-2 is still circulating, especially the number of deaths, admissions to the intensive care units (ICU) due to severe disease, and hospitalizations have decreased significantly as a consequence of the vast development and deployment of effective and safe vaccines against SARS-CoV-2 in a broad number of biotechnological platforms (mRNA, viral vectors, inactive, among others).^[3-5] The global COVID-19 vaccination is a milestone for medicine and vaccinology. More than 10 billion doses have been applied in the world.

But unfortunately, vaccine coverage for primary schedules, as well as for boosters, is unequal between high-income countries and those considered LMIC. Even today in Africa, countries such as Burundi, or the Democratic Republic of Congo, have less than 3% of their people who completed the initial COVID-19 vaccination protocol. Even in the Americas, such as Haiti, other countries still have less than 15% of their

populations vaccinated (Figure 1). Access to vaccines has been a critical issue, as vaccine hesitancy is obviously high in such countries. In this context, autonomous pharmaceutical and biotechnological capabilities during sanitary emergencies have been proposed.^[6] LMICs need to increase them to develop and mainly to produce vaccines, but also at the same time their “vaccination” diplomacy.^[7]

After COVID-19, this is important, as new epidemics, such as the ongoing multicountry outbreak due to monkeypox,^[8] recently declared a Public Health Emergency of International Concern (PHEIC) by the World Health Organization (WHO), are rapidly spreading.^[9] Monkeypox is now present in more than 80 non-endemic countries (outside Africa), causing more than 29,844 cases (Figure 2). Although the WHO does not currently recommend massive vaccination; the LGBTI (lesbian, gay, bisexual, transgender, and intersex) community, the most affected population so far (>95%), as well as the healthcare workers attending cases, will require access to monkeypox vaccines, such as the Jynneos[®].^[10,11] Countries such as the United States of America, Canada, the United Kingdom, Italy, and France, among others, are offering vaccines for monkeypox. But, how long will it take to be available for high-risk populations in LMIC of Asia, Africa and Latin America?

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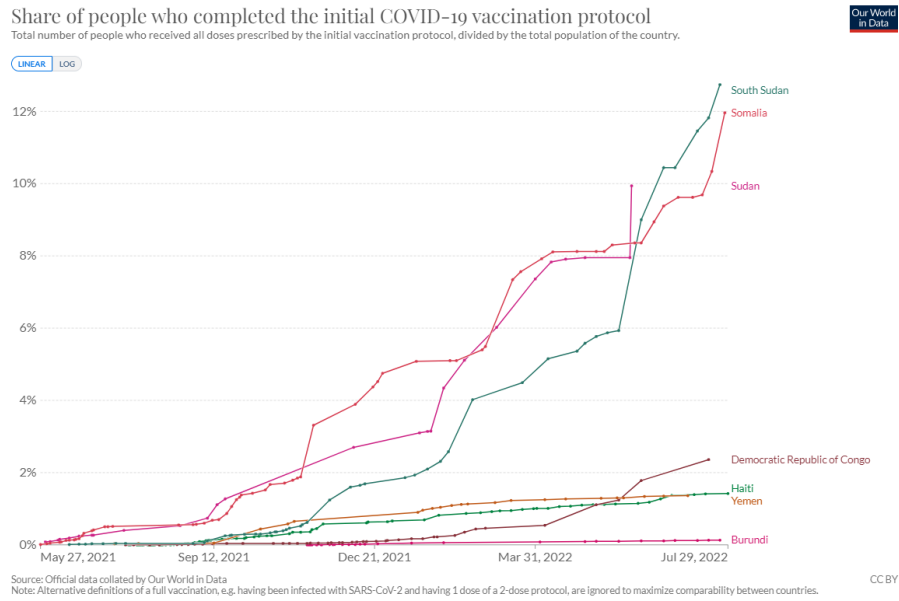


Figure 1. Examples of countries among the lowest vaccination rates for COVID-19, August 9, 2022.

Source: <https://ourworldindata.org/covid-vaccinations>

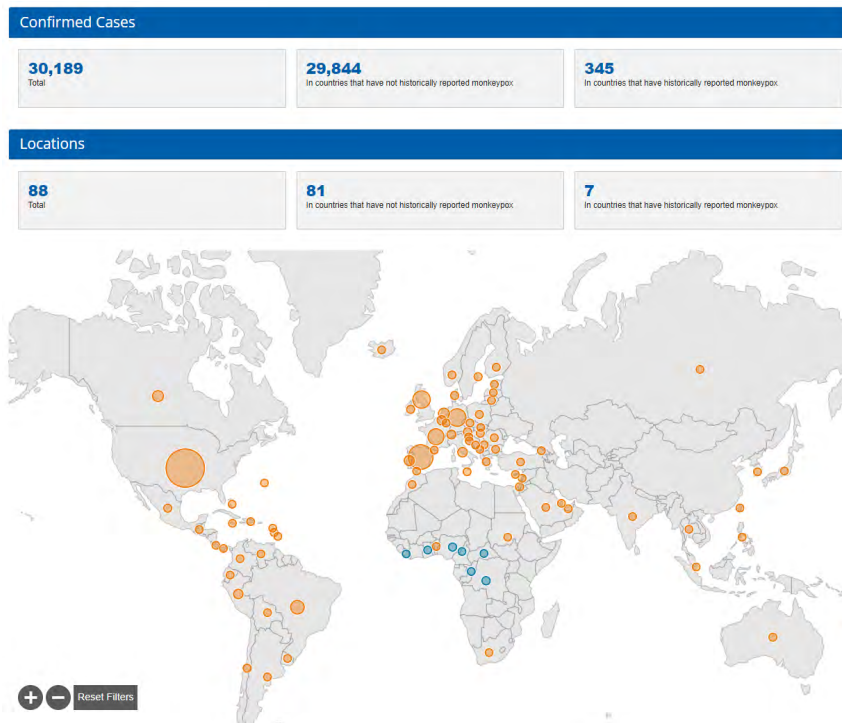


Figure 2. 2022 Monkeypox Outbreak Global Map, August 9, 2022.

Source: <https://www.cdc.gov/poxvirus/monkeypox/response/2022/world-map.html>

Given this situation, the Butantan Institute in Brazil announced that it would assess to produce a vaccine against monkeypox. Brazil, Argentina, Mexico, Colombia, and other countries in the region should be involved in producing COVID-19 and monkeypox vaccines. For example, in Colombia, VaxThera[®], a biotech company, has announced that it will develop and produce vaccines. Under the building, facilities in Rionegro, Antioquia, expect to make 100 million vaccine doses in 2023. In addition, they wish to develop vaccines against COVID-19, dengue, chikungunya, yellow fever, influenza, and Zika. With a new government administration in Colombia, an enhanced interaction between the Ministry of Science, the Ministry of Health and the private biotech sector is urgently needed to address these requirements in the country.

As emerging and reemerging infectious diseases, especially viral and zoonotic, are causing outbreaks, epidemics and pandemics, vaccine availability will be more required than ever.^[12,13]

Conflict of interests

AJ Rodriguez-Morales has been paid member of the advisory board of COVID-19 vaccines of AstraZeneca (2021-2022). AJ Rodriguez-Morales is member of the Editorial Board of *Hechos Microbiológicos*.

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