Disproportionate coronavirus disease 2019 (COVID-19) vaccine distribution—A great threat to low- and middle-income countries

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To the Editor—The coronavirus disease 2019 (COVID-19) pandemic caused by severe acute respiratory coronavirus virus 2 (SARS-CoV-2) has become a noteworthy predicament for the entire world. The World Health Organization (WHO) declared a global pandemic on March 11, 2020. Many drugs and pharmaceutical preparations are being used to improve or reduce the effects of the disease. In the era of this effort, many scientists and pharmaceutical companies are trying to develop effective vaccines to combat this deadly virus.[1] Several vaccine candidates have been brought to the market to contribute to global immunity against this disease, but a serious issue is hindering the fulfillment of this purpose. The unequal distribution of COVID-19 vaccine between high-income countries (HICs) and low- and middle-income countries (LMICs) is thwarting global efforts to mitigate the pandemic. Inequality in the distribution of vaccines has always existed, as demonstrated in the H1N1 influenza outbreak in 2009 when vaccine supplies were completely dominated by developed rich countries.[2,3] Recent studies have shown that, with limited healthcare-related services, LMICs are more likely to have a higher infection and mortality rates than HICs. Richard Hatchett, head of the Coalition for Epidemic Preparedness Innovations (CEPI) said, "If COVID-19 vaccines are misallocated in the way they were in 2009, the pandemic will last longer, more people will die, and the disruption will be greater than it needs to be."[4]

The ongoing COVID-19 pandemic has thrashed away at already weak national economies in LMICs. In this context, unbiased access to an effective COVID-19 vaccine is crucial, especially for frontline healthcare professionals.[4] The Director-General of the WHO said, "Vaccine equity is the challenge of our time, and we are failing." He stated that of the 832 million vaccine doses administered worldwide, 82% have been dispatched to rich countries, while only 0.2% have reached resource-poor nations. In resource-rich countries, 1 in 4 persons have been vaccinated, but this ratio drops to 1 in every 500 people in low-income countries (LICs). This melodramatic inequality in vaccine distribution has led to a frightening increase in new COVID-19 cases and deaths in LMICs. Vaccine nationalism can prolong the catastrophe, economic decline, and misery for the general public. The Council President from Pakistan, Mr. Akram, stated in an interview, "Lives are more important than incentives."[6] At the start of this pandemic, countries adopted a nationalistic attitude, for example, they banned on the export of several medical supplies (ie, ventilators and protective masks) to retain them for themselves.[7]

The COVID-19 pandemic has further highlighted the gross inequalities that have always existed between HICs and LMICs. These inequalities not only cause humanitarian sufferings but also lead to a huge economic burden on LMICs. LMICs are struggling to vaccinate even frontline healthcare workers while rich nations are administering vaccines to even young and low-risk citizens.[8] In a public talk, a representative of the European Union said, "No one is safe until everyone is safe."[6]

Due to the lack of local vaccine manufacturing capacity on a mass scale, LICs rely on rich countries to get the vaccines. Moreover, several factors may pose a significant challenge to vaccine distribution in poor countries (ie, low levels of education and the poor socioeconomic status of the people), and these factors may affect the acceptance of the COVID-19 vaccine among the general public. In LICs situated in geographically less accessible regions of the world (eg, Nepal, Bhutan, and Afghanistan) equitable vaccine distribution is a very difficult task, which furthers disproportionate COVID-19 vaccination. More than 160 million people are at risk of not getting the COVID-19 vaccine in the remote areas of Syria, Yemen, Sudan, and Ethiopia. Furthermore, people living in the urban slums of LMICs have poor access to vaccination services. Also, countries like Brazil and Indonesia have signed deals to purchase millions of COVID-19 vaccine doses that are still in phase 3 trials, which contributes to the acute shortage of vaccines.[4] The lack of suitable means of transporting and storing the COVID-19 vaccine at low temperatures also poses a significant challenge. Most LMICs lack advanced research laboratories, government funds, vaccine-manufacturing policies, planning, and programs. Thus, even if authorization for manufacturing COVID-19 vaccines is given to these countries, it will not solve vaccine distribution problems.[5]

In conclusion, wider availability of the COVID-19 vaccine in LMICs will play an important role in achieving global immunity against this deadly virus. This problem needs to be addressed globally and acted upon urgently. HICs and global health organizations like the United Nations Children's Fund (UNICEF), the Global Alliance for Vaccines and Immunizations (GAVI), and the WHO should support LMICs in acquiring adequate access to the COVID-19 vaccine so vaccines are equally available for everyone.

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Adverse events and humoral response after two doses of severe acute respiratory coronavirus virus 2 (SARS-CoV-2) mRNA vaccine in the hospital personnel of a cardiopulmonary tertiary-care center

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To the Editor—Patients with cardiovascular and chronic obstructive pulmonary disease are at increased risk of severe coronavirus disease 2019 (COVID-19).[1] The hospital environment is particularly prone to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) diffusion; therefore, it is imperative to protect patients and healthcare personnel against COVID-19 outbreaks. COVID-19 vaccination of these populations is the pillar of an effective hospital COVID-19 infection and prevention control (IPC) strategy. To increase its acceptancy and ensure its success, monitoring activities should also be conducted a local level to provide feedback to the targeted populations.

Fondazione Toscana Gabriele Monasterio (FTGM) is a public, tertiary-level, cardiological, pneumological, and heart surgery center with 2 sites, in Pisa and Massa (Italy). It has a cardiac catheterization laboratory hub for acute coronary syndrome and an adult and pediatric cardiac surgery center, and it serves as a referral center for heart failure and primitive pulmonary hypertension patients. FTGM has 123 beds and >5,000 hospital admissions per year. At the beginning of January 2021, according to national and regional regulations, our center started a COVID-19 vaccination campaign for healthcare personnel. The first phase included health workers, administrative staff, and support personnel. The second phase started in March 2021 with an additional vaccination campaign for all outpatients registered on the Tuscany regional COVID-19 vaccination web platform. In the first phase, only Pfizer-BioNTech COVID-19 was used. In the second phase, Pfizer-BioNTech and Moderna vaccines were administered according to Italian clinical recommendations in force.

Our retrospective analysis covers the period between January and May 2021. We evaluated the reported adverse effects (AEs) and the humoral response of the first phase of the vaccination campaign against COVID-19. During the first 10 weeks of the study period, 589 of 811 employees (85%) completed the vaccination cycle, receiving 2 vaccine doses of Pfizer-BioNTech COVID-19 vaccine on day 1 and day 21; of these, 82% were healthcare workers.

At the beginning of March, we invited all people working in FTGM to fill in a questionnaire that included demographic data, medical history, COVID-19–related anamnesis, and local and systemic AE reporting.

Furthermore, 1 month after the second vaccine dose, a serological test to anti–SARS-Cov-2 IgG (Abbott, index value <1.4) and anti–SARS-Cov-2 receptor binding domain (RBD) spike protein antibodies (Abbott, normal range <50 AU/mL) was offered to healthcare workers and administrative staff. We collected data for 272 workers (response rate, 46%).

Clinical characteristics of our population are summarized in Table 1; 14 employees who filled out the questionnaire claimed mild COVID disease before vaccination.

Adverse events were recorded in 50% and 67% of study participants, respectively, after the first and second vaccine doses. Systemic events are more frequent after the second vaccine dose. The postvaccination adverse events (AEs) are summarized in Fig. 1.

Furthermore, participants who reported AEs required antipyretic medication in 20% of cases after the first dose and 58% after the second dose. In most cases, adverse effects lasted <3 days (grade I according to MedDRA classification[2]). After the first dose, we recorded 3 severe AEs that required hospital monitoring due to systemic symptoms. One of these AEs occurred in a study participant with previous COVID-19 disease who required steroid and antihistamine therapy. The second vaccine dose was administered to 271 of 272 patients; 1 participant preferred not to receive the second dose due to previous COVID-19 disease.

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