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Disproportionate distribution of coronavirus disease 2019 (COVID-19) antiviral pills: Vaccine inequity replay?

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To the Editor—The rapid development of the coronavirus disease 2019 (COVID-19) vaccine was only possible due to massive international collaboration in the research and development sector. However, the disproportionate distribution of vaccines led to COVID-19 hotspots and the emergence of new variants, which has already prolonged the pandemic.¹ Since the beginning, the World Health Organization (WHO) has demanded equitable distribution of vaccines. To accomplish this, an initiative named COVID-19 Vaccine Global Access (COVAX) was started to equally distribute vaccines among all countries regardless of their contribution to the development.² However, did not occur because affluent countries, to quickly vaccinate their population, started to stockpile the vaccines. Thus, the distribution was asymmetrically in their favor, leading to a global shortage, especially in the third world and developing countries. Recently, US President Joe Biden stated in a vaccine summit that the United States would distribute the 100 million stockpiled vaccines to the lower- and middle-income countries (LMICs).³ This extensive stockpile exemplifies the hoarding that occurred, which resulted in untold unnecessary loss of lives. According to a model by Northeastern University, the proportional distribution of vaccines can avoid twice as many deaths as vaccine distribution limited to high-income countries.⁴ To further illustrate this issue, a Lorenz curve and Gini coefficients, which are used for inequality indices, were adopted.⁵ The Lorenz curve suggests that 20% of the world population had control >95% of COVID-19 vaccinations. Similarly, the Gini coefficient for vaccines, ranging from 0 to 1, was 0.86, which indicates highly unequal distribution.¹ According to the Global Dashboard of vaccine equity, only 3.07% of people have been vaccinated for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in LMICs compared to 60.18% in high-income countries (HICs) as of September 15, 2021.⁶ This situation has been further aggravated by ineffective and selective government policies. In Brazil, only people living in legally marked territories were vaccinated, leaving others

unvaccinated.⁷ In India, inadequate and inequitable vaccine distribution has led to several instances of vaccine shortage despite this country being the top manufacturer of COVID-19 vaccines.⁸ The unequal distribution will not only aggravate the pandemic but will also increase inequality and deepen the gap between different segments of society. Ultimately, this will reverse the progress of human development.⁹ The situation of unequal drug distribution is not limited to COVID-19 vaccines. African countries have been severely affected by the ongoing crisis: pre-existing drug shortages have been worsened due to the effect of the pandemic on the global supply chain. In Nigeria alone, 70% of the drugs are imported, but due to global shortage and lockdowns, essential and life-saving drugs, including antiviral and antiretroviral drugs, have become scarce.¹⁰

During this pandemic, we have seen a remarkable pace and progress in terms of COVID-19 vaccination. Lately, 2 pharmaceutical companies, Pfizer and Merck, have announced the development of COVID-19 antiviral pills that significantly decrease hospitalizations. This discovery is a blessing for those countries where there is a shortage of vaccines.¹¹ It is too early to predict whether these drugs will meet expectations. In theory, the drugs should be effective against the current variants including the highly transmissible and aggressive δ (delta) variant. The disease burden in affected areas should be a properly assessed, which is a complex process. A strategy based on the egalitarian concept of distribution should be used that emphasizes the equality of every individual concerning health and well-being.⁹ This equity could be achieved by effective distribution based on a well-designed system of distributive justice.⁹ At times, distribution is not easy given the geographical conditions and lack of facilities to store and transport these medicines, but the efforts of Nepal in eradicating tuberculosis are remarkable given that most of its area is mountainous and hilly.¹² Another possibility of unfair COVID-19 pill distribution could relate to wealthy countries paying a handsome amount to these companies, leaving little to no room for LMICs. In most developing countries, it is more profitable for companies to sell drugs to the wealthy segment of the society instead of selling to a larger number of people at lower prices. As a result, medicines remain inaccessible to most of the population. To prevent this from happening

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with COVID-19 antiviral pills, an independent organization must critically examine the role of such pharmaceutical companies.

In addition, these drugs could develop early resistance, making this drug a failure. Whatever the outcome, if these drugs are approved for a wider population, then the LMICs should get their proper and proportionate share. Unequal distribution will not only have a disastrous impact on global health but also socioeconomic recovery in low-income countries. The impact of this pandemic on these countries may last until 2024, whereas in affluent countries a recovery in terms of GDP may occur by the end of 2021.⁹ All higher authorities should intervene now, including the World Health Organization and United Nations, to ensure this proportionate distribution before it is too late.

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Coronavirus disease 2019 (COVID-19) oral antivirals stewardship: Establishing game rules

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To the Editor—Vaccines against coronavirus disease 2019 (COVID-19) are the cornerstone of preventive strategies during this pandemic.¹ However, COVID-19 vaccine immunity wanes over time,² while specific population groups, such as the immunocompromised, may not be able to mount an adequate immune response to COVID-19 vaccination.³ In addition, new variants with spike-protein mutations continue to emerge, raising concerns about immune escape and breakthrough infections in vaccinated individuals.⁴

Recently, based on the results of relevant clinical trials, an emergency use authorization was granted by the FDA for 2 new oral antivirals against COVID-19: molnupiravir by Merck and Ridgeback Biotherapeutics and Pfizer’s nirmatrelvir-ritonavir.

These antivirals, when administered within 5 days of symptom onset in adult patients with mild to moderate COVID-19, reduced the risk of hospitalization and death.^{5,6} Both target specific enzymes and functions other than the spike protein and can complement vaccines. Nevertheless, the urgent need for effective outpatient treatment amid ongoing transmission entails the risk of irrational use of these antivirals. Thus far, data regarding the potential to induce resistance in case of inappropriate use are lacking. Cost should also be taken into consideration because each treatment course costs hundreds of dollars.^{7,8}

For these reasons and to optimize their use, antiviral stewardship initiatives are necessary. These initiatives should target various sectors and levels of the medication prescription chain, including the healthcare system, prescriber and patient education, prescription practices, patient monitoring and feedback, communication, and diagnostics (Fig. 1).

From a healthcare system perspective, administration monitoring via electronic prescription is an efficient way to control

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