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Editorial

COVID-19 vaccine wastage in low-income countries: What is the starting point?

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It can sound ironic to discuss COVID-19 vaccine wastage amid frequent claims of unequal distribution of vaccines during the pandemic. Indeed, since the official report of the first cases of COVID-19 due to a novel coronavirus in December 2019 [1], scientists and health authorities have agreed to use vaccination as a spearhead in the battle against the emergent epidemic. Vaccines come from complex technologies requiring several years to be conceived and tested. However, in the era of a global pandemic, with significant contagiousness and lethality, time was not a luxury the world could afford. Nations and their researchers understood the call for a collaborative effort toward the same goal: vaccine development and distribution. By the end of 2020, countries such as China, Russia, the United Kingdom (UK), the United States of America (USA), and Canada, among others, started vaccinating their population [2]. Through the COVAX initiative co-led by the World Health Organization (WHO), the Coalition for Epidemic Preparedness Innovations (CEPI), and GAVI, the access to COVID vaccines should be fair and equitable for each country [3]. However, the discourse has soon shifted from vaccine unavailability in early 2020 to vaccine inequity in early 2021. Asundi et al. reported that until May 2021, 85% of global vaccine doses were distributed in High-income countries, with 75% limited to 10 countries [4]. Since then, the situation has evolved but remains concerning; 67.5% of the world population had received at least one dose of vaccine, but when we considered low-income countries (LIC) specifically, this rate dropped to 20.7% [5].

While the discussion is still ongoing for greater access to vaccines for LICs, a new concern arose: the alert about COVID-19 vaccine wastage. In his article, Kartoglu presents the causes of such wastage and discusses areas for improvement [6]. This commentary aims to provide additional insights from a low-income country's perspective.

Vaccine wastage can occur for any vaccine at different steps of the process. Kartoglu et al. clearly explained those vulnerable periods and suggested possible solutions. Indeed, as vaccines can be wasted during storage in situations like dropped vials and products altered by temperatures, the author recommends continuously applying standard good practices to avoid those lost [6]. Breakage of vials can occur during transport and administration as well. Another frequent aspect is the necessity to discard non-used doses in open vials of vaccines. This raises the dilemma of losing potential participants by asking them to return another day if there are not enough people for the number of doses available or administering the doses to the participants present and losing the rest of the vaccines. Kartoglu reminds us that those losses are unavoidable because the vaccination program rule should prioritize people over the product by opening the multi-dose vial even if only one person is available for vaccination [6]. Another aspect to consider is the loss due to expiry. This loss can imply a weak or non-existent inventory system or flaws in the planning process. In addition to the causes related to the product management precised by Kartoglu et al. we want to insist on the loss due to expiry by considering the whole vaccination ecosystem.

1. Local context and vaccine procurement

Vaccine procurement is a complex process involving many local and international factors. Many actors intervene at the programmatic, financial, and public health levels to ensure that the supply is correlated to the demand and distributed to the needy population. But when there is a mismatch between the people in need and the practical demand, this aspect can derail the vaccine supply chain and lead to vaccine wastage. For example, in October 2021, Haïti announced that it had to return hundreds of thousands of expiring Moderna vaccines for redistribution in other countries to avoid wastage. Among the 500000 doses received on July 14, 2021, less than 15% had been used [7]. Four months before on April 2021, Malawi had to destroy 16 000 doses of AstraZeneca with an expiry date of 13 April [8]. Even if the vaccines were available, they were not able to be administered at the anticipated pace. It is where context arose. COVID-19 as an emergent disease was wrapped in many questions, doubts, and uncertainties. The COVID vaccine inherits this lack of trust or certainty in addition to that directed against the product itself. This mistrust was reinforced by a misinformation campaign easily and quickly relayed through social media.

Additionally, with 32 703 infections and 838 deaths reported from March 2020 to August 12, 2022, Haïti counts among the 25 countries with a lower prevalence of COVID and fatalities related to the disease in the Americas [9]. This situation often leads part of the community to

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Abbreviations

LIC	Low-Income Country
VSC	Vaccine Supply Chain
UK	United Kingdom
USA	United States of America

question the necessity of receiving the COVID-19 vaccine. It has been proven that perception of risk and danger counts as drivers or deterrents to vaccination. For those reasons, Weintraub et al. recommend generating the demand by investing in vaccine delivery for COVID-19 extensively applied in that context [10]. Indeed, a traditional vaccine delivery system may not work in that case considering the higher level of hesitancy related to the COVID vaccine. Innovative communication and information systems should be used, including influencers, authority, and trustworthy figures to increase vaccine acceptance and administration. Community trust also depends on receiving timely, transparent communication. The strategic fight against disinformation also proves to be paramount to increase the confidence of the population.

2. Timeliness of the distribution

This led us to discuss the timeliness of the distribution and its effect on vaccine wastage. While part of the world started to immunize its population in late 2020, Haïti received its first batch of vaccines on July 14, 2021 [11]. Until then, the country was the only one in the Americas that did not receive a single dose of COVID-19. Communication matters as much as the medical response in public health emergencies such as a pandemic. Timeliness of the interventions is also a critical enabler in preventing new infections, decreasing the disease complications for the person affected, and building the population's trust. The contrary is also true. Finally, COVID-19 came with some requirements demanding adaptation of the already weak healthcare system in LICs. COVID-19 vaccines, in opposition to the previous vaccines, which have years of shelf life, can be used for 3–6 months. Additionally, some of them required shallow temperatures to be stored. If they are donated close to their expiration date, the issue of wastage will certainly arise based on all the precedent considerations.

3. Conclusions

Vaccine COVID-19 wastage represents a severe concern when global vaccination coverage is not yet optimal, and new variants continue to create waves of infections and mortality. The context of war between European countries affecting gas prices raises concerns about the extension of this expensiveness on LICs' cold chain and may increase their vaccine expenditures. National programs should strengthen their vaccine supply chain (VSC) and respect standard procedures to reduce wastage in storage, transport, and vaccine administration. Reinforcing the VSC with an agile information system, timely monitoring the waste, their causes, and geographical concentration could facilitate planning and decision-making. Finally, because COVID-19 sensibilization, like any other vaccination campaign, is encouraging healthy people to receive an intervention and considering the hesitancy surrounding COVID-19, innovative communication efforts and context-specific strategies should guide the delivery of vaccines in the communities to optimize their utilization and decrease the risk of wastage.

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