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Addressing Global Inequities in Poxvirus Vaccination: Strategies for a More Equitable Future

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Abstract

There has been persistent vaccine inequity between high-income and low-income nations, resulting in the prevalence of infectious disease epidemics in Sub-Saharan African countries. While the global surge in poxvirus cases peaked in 2022, western and central African countries have struggled with this virus since the 1970s [1]. These nations face numerous barriers to accessing adequate vaccination. Wealthy nations acquire vaccines at higher rates due to their ability to bear the high costs, forcing poorer nations to rely on donations and low-cost subsidies. This situation is further complicated by inadequate healthcare infrastructure and socioeconomic, cultural, and geographical obstacles. To address these challenges, comprehensive, inclusive, and integrated approaches are essential, incorporating preventive measures, surveillance systems, low-cost vaccines, vaccine subsidies, the expansion of vaccine manufacturers, and vaccine education through multi-sectoral collaborations in both the public and private sectors.

Keywords: *Poxvirus vaccination, Monkeypox, Disease surveillance, Vaccine awareness, Vaccine inequity*

Preventive Measures and Community Involvement

Similar to other infectious diseases, preventive measures for the poxvirus include maintaining diligent sanitation, such as thoroughly washing hands with clean water and regularly cleaning and disinfecting spaces. However, these measures face significant obstacles in Africa due to limited access to clean water and inadequate water and sewage treatment facilities [2]. Resources need to be mobilized to develop water treatment plants, sanitation infrastructure, and waste management systems. Implementing preventive measures requires community involvement, with local village leaders playing a crucial role in educating residents about prevention and early treatment. To enhance prevention efforts, recruited local trainees can be mobilized.

Surveillance Systems

Since Mpox has both animal and human reservoirs, it is theoretically difficult to control and eradicate, necessitating the maintenance of active surveillance systems [3]. However, effective surveillance is challenging in most African countries due to a lack of diagnostic capacity to detect monkeypox [4]. Logistical barriers further contribute to the underreporting of cases, but this can be partially overcome by mobile phone apps, which allow for quick information delivery from remote areas to central health information systems. Effective surveillance relies on strengthening diagnostic capacity, providing affordable diagnostic tests, and ensuring adequate staff training.

Collaboration of Health Agencies

The 2022 Mpox outbreak led the WHO to create the Mpox Strategic Preparedness, Readiness, and Response Plan (SPRP) [5]. Collaboration between WHO staff and national and provincial health agencies is crucial for addressing global disparities in poxvirus vaccination. The WHO can adopt a proactive approach to assist countries in implementing the SPRP, increasing monkeypox vaccine production, donations, and subsidies, and enhancing disease surveillance systems and vaccine awareness campaigns.

Vaccines

Jynneos, Imvanex, and Imvamune vaccines can prevent Mpox, but the rollout of vaccination campaigns exposed significant global disparities in vaccine procurement and distribution. High-income countries or those with high vaccine production capacities were prioritized. In 2022, nearly 80% of the world's Mpox vaccine supply was held by the U.S., while African nations faced considerable challenges in accessing vaccines [6]. The global shortage of Mpox vaccines, coupled with high prices, excluded low-income countries. Despite the U.S. allocating $1 billion for Mpox vaccines, only half of the affected countries received access [7].

To contain Mpox outbreaks in endemic African countries, subsidies for a low-cost vaccine are essential. A targeted vaccination approach, focusing on exposed and high-risk populations, requires fewer donated doses and is more cost-effective for donors. Despite facing high mortality rates from infectious diseases, Africa's vaccine manufacturing capacity is limited. In response, the African Union and GAVI, The Vaccine Alliance, are expanding this capacity by increasing the number of manufacturers from 10 to 17 and diversifying vaccine portfolios [8]. American Tonix Pharmaceuticals, in collaboration with the Kenya Medical Research Institute, is also working on potential local vaccine production [9].

Vaccine Education

The distribution of the limited vaccines in African nations was impeded by an intricate tapestry woven from factors including unaffordable costs, lack of proximity to vaccination sites, inadequate medical services, and deeply entrenched socioeconomic and cultural barriers such as mistrust of vaccines, misinformation, and cultural opposition [10,11]. At the community level, vaccine advocates and opinion leaders should collaborate to disseminate vaccination knowledge to ensure that vulnerable populations understand the importance of vaccination and have easy access to it. Authorities should establish a monitoring system to engage with targeted communities, delivering timely and accurate information on poxvirus transmission, preventive measures, and treatment. Additionally, they should enhance access to vaccination sites through the use of mobile apps.

Conclusion

African nations are likely to experience more severe impacts from modern epidemics. Recognizing this sobering reality is essential for creating global cooperative pandemic-control organizations. Their collective efforts should focus on expanding vaccine procurement, production, and allocation in African nations. Drawing lessons from the global inequities in vaccination during the Covid-19 pandemic, high-income countries should support these nations, which face persistent infectious diseases and fragile healthcare infrastructures, by helping to expand preventive measures, vaccine donations, and subsidies [12]. As worldwide epidemics may occur routinely, healthcare decision-makers should continue to promote risk-mitigating behaviors, maintain open and transparent risk communication with the public, and foster community compliance. Future pandemic control efforts will depend heavily on global coordinated actions, cooperation, and communication, rather than competition and concealment, to develop affordable, widely distributed, broad-based, and long-lasting vaccines.

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