

Africa and monkeypox vaccinations: A call for action

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Original Submission: 4 October 2022; **Revised Submission:** 8 October 2022; **Accepted:** 10 October 2022

Article published online: 21 October 2022

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Dear Editor,

Monkeypox disease (MPXD), a zoonotic disease caused by the monkeypox virus (MPXV), was declared a Public Health Emergency of International Concern (PHEIC) by the World Health Organization (WHO) on July 23, 2022. According to the Centers for Disease Control and Prevention (CDC), as of October 6, 2022, 70,696 monkeypox (MPX) cases have been reported in 107 different worldwide locations (Fig. 1). MPX has been historically reported in 7 of these locations all of which are in the rural settings of the rainforest areas of West and Central Africa, where the transmission has mainly been due to spillover events from animal reservoirs and occasionally human to human among young children and women who usually serve as primary caregivers, while the remaining 100 locations have not reported MPX cases previously and the transmission pattern has been mainly in sexual networks of men who have sex with men (MSM), gay and bisexuals. In Africa, a total of 747

cases have been reported in 12 African countries, and 4 of them have reported a total of 14 deaths (Fig. 2) [1].

MPXV is an enveloped double-stranded DNA virus. It is a large and complex virus with a much slower ability to mutate over time in contrast to RNA viruses. It is a member of the Orthopoxvirus genus of the Poxviridae family which is the same family of variola virus (smallpox). MPXV has two types; the Central African clade with higher transmissibility, more severe disease, and a higher fatality rate than the West African clade [2].

There are a few effective strategies to stop the MPX outbreak. One key strategy which has already shown effectiveness in slowing the speed of the disease spread is the education of at-risk individuals and getting better at early detection of cases to reduce virus transmission. The second strategy includes vaccination of the at-risk groups, including (MSM, HCWs, and individuals for high risk of complications including pregnant women and young children) as a preventative strategy and vaccinating close contacts of the confirmed case within 4 days of the diagnosis to prevent transmission.

Smallpox vaccines are effective against MPXV due to cross-protection between the viruses of the Orthopoxvirus genus (85%). Currently, ACAM2000, and JYNNEOS/ MVA-BN; licensed for use in the USA, are two available vaccines to prevent MPXV infection. There are two other smallpox vaccines; LC16 which is a third-generation vaccine and Vaccinia (Dryvax, Lister, Copenhagen), a first-generation vaccine, however, they are not recommended for use against MPXD [2].

The global accessibility of an MPX vaccine will help fight to reduce the number of cases and alleviate complications, thus, all countries should have access to the available vaccines. Since the cessation of the smallpox vaccination by WHO in 1980, it left more than 70% of the population susceptible to smallpox and its closely related MPXV. However, there is an uneven distribution of available vaccines across the world. The USA has the highest number of cases reported worldwide with a little less than a fourth percent of cases, however, it has around 80 percent of the global JYNNEOS (MVA-BN) supply. As of August 31, 2022, the USA has 1.1 million obtained doses and 7 million ordered doses, which is an estimates 60 available doses for every reported case [3]. Canada has the second highest number of available doses with 99,000 obtained doses and a further 750,000 ordered doses, as of August 31, 2022, despite having less than two percent of globally reported cases [4].

As of August 31, 2022, some countries such as Brazil, which has reported almost a tenth of global cases, do not have any available vaccines [4]. Countries such as Brazil, Colombia, and Latin America have no obtained doses. Africa despite being the



FIG. 1. The overall number of monkeypox confirmed cases worldwide, as of October 6, 2022.

place where monkeypox is endemic in some of its countries and having almost a tenth of globally reported cases have no accessible vaccine or orders [4].

The cause of the uneven distribution of vaccines worldwide can be contributed to pricing. The price of doses has been unified worldwide by JYNNOS at approximately 110 dollars a dose. The steep pricing may mean that African countries may not be able to obtain any doses anytime soon [3]. Since the dependence of African countries in the 1960s, they have

depended on other countries outside Africa to import medical facilities such as personal protective equipment, diagnostic tools, medicines, vaccines, and other vital medical supplies [5]. Unfortunately, Africa imports 95% of its needed treatments and 99% of its needed vaccines from outside, however, it consumes 25% of the produced vaccines globally [5].

To conclude, it is important to first focus on ensuring vaccine availability to high-risk groups to ensure their protection and decrease or even avoid the further spread of MPX. It is also

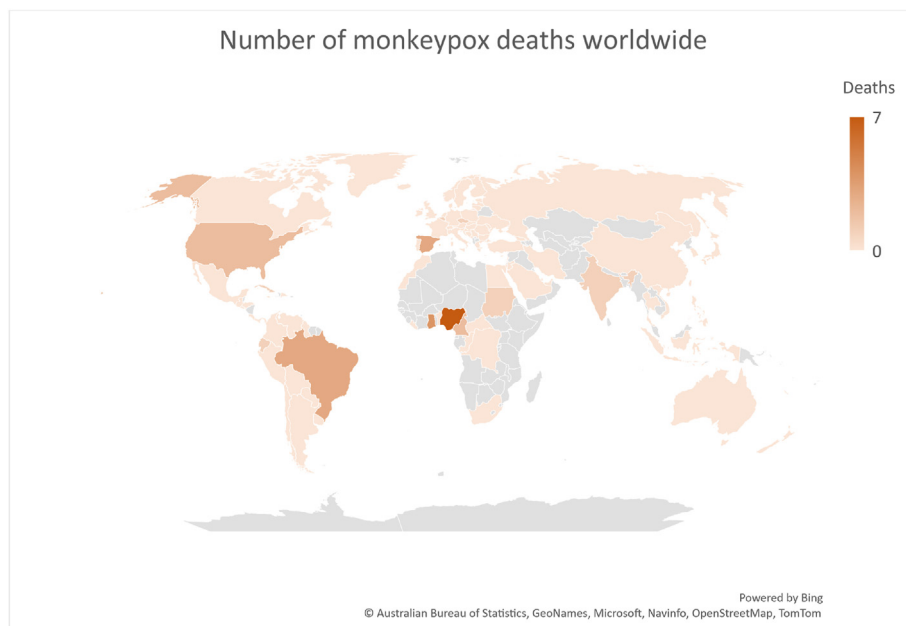


FIG. 2. The overall number of monkeypox deaths worldwide, as of October 6, 2022.

important to take a more public health-oriented strategy to provide Africa with vaccines, meaning that coordinating the availability of both domestic and international funding is necessary. A collective international movement such as the “One plan” and “One Country Team” which was set during the COVID-19 pandemic by the WHO, United Nations International Children’s Emergency Fund (UNICEF), and the Global Alliance for Vaccines and Immunization (GAVI), alongside international partners such as the World Bank, will improve country readiness and provided better delivery support. The “One Plan” movement provided 34 countries with COVID-19 vaccines. A repeat of this unified movement may help reduce the number of global MPX cases, especially in Africa, provide vaccines for African high-risk countries, and will help the world overcome this multi-country outbreak quicker and more efficiently. A not-for-profit pricing approach is paramount to avoid unifying the price of vaccines [3]. Another approach would include sharing the technology and manufacturing strategy with African countries, especially Egypt which is known for its vaccine production capability and experience in manufacturing vaccines for diseases such as rabies, Rift Valley Fever, and polio [5]. Additionally, Egypt can be the vaccines manufacturing hub in Africa to ensure the MPX vaccines distribution in a quick and timely manner. However, some obstacles should be overcome in Africa such as the limited capacity of vaccine production due to a lack of trained staff, public health infrastructure, the limited vaccine manufacturing technology and information [5]. The increased number of MPX vaccines by African countries

manufactured will inevitably provide a more affordable vaccine supply. Strong supply chains of MPX vaccinations across Africa will help speed the rate of production and delivery [5].

Conflicts of interest

None.

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