

Commentary



Monkeypox resurgence in Africa: the importance of a coordinated approach to eliminate the spread of infectious diseases of pandemic potential

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Monkeypox resurgence in Africa: the importance of a coordinated approach to eliminate the spread of infectious diseases of pandemic potential

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Abstract

Many countries within the African continent remain vulnerable to infectious diseases of pandemic potential such as monkeypox. This viral zoonotic disease can infect humans, leading to a febrile illness characterized by symptoms such as fever, headache, muscle aches, and exhaustion. The resurgence and devastating effects of monkeypox, especially within countries in West Africa like the Democratic Republic of Congo and Cameroon contribute to increased morbidity and have caused a severe strain on healthcare systems. This has highlighted an urgent need to formulate structures to effectively respond to infectious diseases of pandemic potential globally and within low and middle-income countries. Lessons from the coronavirus (COVID-19) pandemic have been fundamental to highlight the need for enhanced coordination efforts to strengthen disease surveillance, community outreach programs, and resource mobilization. Strengthening these areas of coordination is vital to effectively respond to infectious diseases of epidemic and pandemic potential like monkeypox. This is aligned with the establishment of global collaboration initiatives, such as the Global Research Collaboration for Infectious Disease Preparedness-Africa Hub which coordinates research efforts against infectious diseases to ensure resilient health systems and improve preparedness for future outbreaks within the African continent.

Commentary

The history of infectious diseases is as old as human civilization, with countless examples demonstrating their devastating impact across continents [1]. Indeed, throughout history, infectious diseases have shaped societies,

economies, and the course of human events. The Black Death (bubonic plague), caused by the bacterium *Yersinia pestis*, swept through Europe in the 14th century, leading to the death of approximately one-third of the population. Similarly, the Spanish flu of 1918, an H1N1 influenza virus, infected about one-third of the global population and resulted in millions of deaths. The spread of smallpox, caused by the variola virus, played a significant role in the colonization of the Americas, decimating indigenous populations who had no immunity to the disease. This extends to human immunodeficiency (HIV) and its profound impact on global health, particularly in sub-Saharan Africa [1].

The recent emergence of the novel coronavirus (COVID-19) has brought unprecedented challenges to global health and economies [2]. First identified in December 2019 in Wuhan, China, COVID-19 rapidly evolved into a pandemic, affecting nearly every corner of the globe. Its impact on general health was profound, overwhelming healthcare systems, disrupting routine medical services, and exacerbating existing health inequalities. The economic consequences were equally severe, with significant job losses, business closures, and economic downturns. Low- and middle-income countries (LMICs), particularly those in Africa, have faced unique challenges in dealing with infectious diseases of pandemic potential. Limited healthcare infrastructure, shortages of medical supplies, and inadequate access to vaccines have compounded the health crisis [2]. Infectious diseases continue to highlight an urgent need for global solidarity and support to bolster healthcare systems and economic resilience, particularly in the world's most vulnerable regions.

Curbing the spread of infectious diseases with pandemic potential in LMICs, particularly in Africa, is critical for global health security. The monkeypox resurgence in Africa [3] highlights the need for coordinated efforts for early disease detection and rapid response to outbreaks to

prevent widespread transmission. These efforts include strengthening community outreach programs ensuring that vital health information and services reach the most vulnerable populations and promoting preventive measures and early treatment [4]. Additionally, mobilizing resources, both financial and technical, is crucial for building resilient healthcare infrastructures. These initiatives support international collaboration as a fundamental aspect of equitable access to medical supplies, vaccines, and treatment options, ultimately effectively responding to infectious diseases of pandemic potential.

An overview of monkeypox, its clinical manifestation, and resurgence in Africa

Monkeypox was first discovered in 1958 when outbreaks of a pox-like disease occurred in colonies of monkeys kept for research, hence the name "monkeypox" [5]. It wasn't until 1970 that the first human case was identified in a child from the Democratic Republic of Congo (DRC). Since then, monkeypox has become a prominent infectious disease, primarily affecting central and West African countries [5]. Monkeypox has been reported in seven African countries (Cameroon, Central African Republic, the DRC, Liberia, Nigeria, the Republic of the Congo, and Sierra Leone), resulting in a total of 8,479 cases and 401 deaths by June 14, 2024 [6]. The Democratic Republic of Congo accounts for approximately 97% of these cases. The DRC is experiencing its largest Mpx outbreak yet, with reported cases and deaths doubling compared to the total reported in 2023 [7].

Monkeypox cases have recently been reported occasionally in other African regions like South Africa. For example, the South African Department of Health recently confirmed sixteen cases [8] with individuals living with HIV among those affected. Although there is no direct link between HIV and infection with monkeypox, people living with HIV are immunocompromised making them susceptible to the condition. Monkeypox presents

with symptoms like smallpox, though generally less severe. The initial symptoms include fever, headache, muscle aches, and exhaustion, followed by the development of a distinctive rash. Progressively, the symptoms encompass a rash that typically begins on the face before spreading to other parts of the body, evolving from macules to papules, vesicles, pustules, and finally scabs. Lymphadenopathy, inferring the swelling of the lymph nodes, then becomes the key feature distinguishing monkeypox from smallpox. Children, pregnant women, and people with a weakened immune system are at higher risk of complications and death. Transmission occurs through direct contact with infected animals, human-to-human transmission via respiratory droplets, or contact with bodily fluids and contaminated materials [6].

There is no specific treatment approved for monkeypox, but supportive care and symptomatic treatment can significantly improve patient outcomes. However, antiviral agents such as cidofovir, brincidofovir, and tecovirimat have shown some effectiveness in animal studies and are being considered for emergency use in severe cases. Vaccination with the smallpox vaccine has been found to provide cross-protection against monkeypox [6,7]. The major limitation has also been the unavailability of an approved monkeypox vaccine for children [7]. Thus, recent outbreaks have signified the importance of maintaining strategic stockpiles of vaccines and antiviral agents to be deployed during outbreaks. The societal impact of monkeypox can be profound, especially in regions with limited healthcare infrastructure. For example, in DRC, recent monkeypox outbreaks have led to significant morbidity, strain on healthcare systems, and economic disruption. In remote and underserved areas, the spread of monkeypox can be particularly devastating, highlighting the need for robust healthcare systems and public health strategies [6,7].

Monkeypox is considered a potential infectious disease of pandemic potential due to several factors. Its ability to infect both humans and a

wide range of animal hosts creates numerous opportunities for spillover events. Furthermore, human-to-human transmission, although less efficient than some other viruses, can sustain outbreaks, particularly in densely populated areas [6,7]. It is presumed the international movement of people and goods increases the risk of cross-border spread. This may explain the recent resurgence of monkeypox in various regions and raised concerns about its potential to cause more widespread outbreaks [6,7].

Coordinated approaches to eliminate infectious diseases of pandemic potential, including monkeypox

In many African countries, limited resources and inadequate funding for health research have posed significant challenges to addressing infectious diseases. Despite the immense potential for scientific advancement and the growing presence of highly skilled researchers, the lack of financial support and infrastructural development hampers efforts to tackle health crises effectively [9]. This implicates an increased need for coordinated approaches to eliminate infectious diseases of pandemic potential to safeguard public health, which is vital for the sustainable development of African countries.

Strengthening disease surveillance is a cornerstone for coordinated efforts. Effective surveillance systems enable the early detection and monitoring of infectious diseases, allowing for prompt responses to outbreaks [9]. These systems should incorporate both traditional methods and modern technological advancements, such as genomic sequencing and digital health platforms, to enhance data collection, analysis, and reporting [9]. For example, the integration of mobile health tools can facilitate real-time reporting and tracking of disease cases, particularly in remote and underserved regions [9]. Improved surveillance not only helps in identifying and containing outbreaks quickly but also provides valuable data for research and policymaking, as seen with the monkeypox

surveillance and reports by the National Institute for Communicable Diseases (NICD) in South Africa. However, the strength is the coordination of public health surveillance between points of entry and the national public health surveillance system, including global health organizations such as the World Health Organization (WHO) [10].

Enhancing community outreach programs is equally important to effectively respond to infectious diseases of epidemic and pandemic potential. Community engagement is vital for ensuring public cooperation and trust in health interventions. For example, education and awareness campaigns remain vital to inform communities about preventive measures, symptoms, and the importance of seeking timely medical care [9,10]. This extends to involving community leaders and local organizations in these efforts which can help tailor messages to cultural contexts and address any misconceptions or fears. For instance, during the Ebola outbreaks in West Africa, community outreach efforts that involved local leaders and healthcare workers were instrumental in controlling the spread of the virus. Similarly, in the context of monkeypox, raising awareness about the disease, its transmission, and preventive measures through community-based initiatives can significantly reduce transmission rates and improve health outcomes. This has been the main focus of the Centers for Disease Control and Prevention (CDC) Foundation, a global nonprofit organization that manages public health programs that impact chronic and infectious diseases, to aggressively respond to the current monkeypox outbreak in West Africa [6,7].

Mobilizing resources is another critical aspect of coordinated approaches. Adequate funding and resources are necessary to support research, healthcare infrastructure, and emergency response capabilities. This includes investing in the establishment of well-equipped laboratory facilities, increasing the capacity of healthcare professionals, and ensuring the availability of essential medical supplies and equipment.

International collaboration and partnerships play a vital role in resource mobilization. Organizations such as WHO, the African Union, and various non-governmental organizations can provide technical assistance, funding, and logistical support to strengthen national and regional capacities [9,10]. The ongoing collaboration between the Africa Centres for Disease Control and Prevention (Africa CDC), WHO, and other government entities has been instrumental in responding to the ongoing monkeypox resurgence in DRC [6,7]. Even the emergence of Global Research Collaboration for Infectious Disease Preparedness (GloPID-R), including its Africa Hub that focuses on coordination efforts in countries within the African region, has provided significant progress to enhance global approaches to responding to infectious diseases of pandemic potential, as seen in their role in providing tools to respond to the COVID-19 pandemic. Importantly, coordination efforts are essential for resource sharing for the rapid development and distribution of vaccines and treatments against infectious diseases of pandemic potential. In Africa, the collaborative approach to managing COVID-19, which involves regional cooperation, international support, and community engagement could serve as a model for addressing monkeypox resurgence within the continent.

Conclusion

Eliminating infectious diseases with pandemic potential requires a coordinated approach. This includes strengthening disease surveillance, enhancing community outreach programs, and mobilizing resources for enhanced capacity and infrastructure development. Importantly, African countries need to leverage the lessons learned from the COVID-19 pandemic to build more resilient health systems and improve their capacity to respond to emerging health threats.

Competing interests

The authors declare no competing interests.

Authors' contributions

Yonela Ntamo, Phiwayinkosi Vusi Dlodla, Edison Mavundza, Musawenkosi Ndlovu, Ndivhuwo Muvhulawa, Asanda Mayeye, Nomahlubi Lumphondo, and Duduzile Ndwandwe equally contributed to conceptualizing and writing the original and final draft of the manuscript. All the authors have read and approved the final version of this manuscript.

References

1. Sakai T, Morimoto Y. The History of Infectious Diseases and Medicine. *Pathogens*. 2022 Oct 4;11(10):1147. **PubMed** | **Google Scholar**
2. Naseer S, Khalid S, Parveen S, Abbass K, Song H, Achim MV. COVID-19 outbreak: Impact on global economy. *Front Public Health*. 2023 Jan 30;10:1009393. **PubMed** | **Google Scholar**
3. Dhawan M, Emran TB, Islam F. The resurgence of monkeypox cases: Reasons, threat assessment, and possible preventive measures. *Travel Med Infect Dis*. 2022 Sep-Oct;49:102367. **PubMed** | **Google Scholar**
4. Ellwanger JH, Veiga ABG, Kaminski VL, Valverde-Villegas JM, Freitas AWQ, Chies JAB. Control and prevention of infectious diseases from a One Health perspective. *Genet Mol Biol*. 2021 Jan 29;44(1 Suppl 1):e20200256. **PubMed** | **Google Scholar**
5. U.S. Centre for Disease Control and Prevention. About Mpox. 2024. Accessed June 21, 2024.
6. The Africa Centres for Disease Control and Prevention. Mpox Outbreak in South Africa. 2024. Accessed June, 27 2024.
7. European Centre for Disease Prevention and Control. Implications for the EU/EEA of the outbreak of mpox caused by Monkeypox virus clade I in the Democratic Republic of the Congo. 2023. Accessed February 21, 2024.

8. South African Government News Agency. Mpox cases rise to 16, death toll increase to three. 2024. Accessed June 27, 2024.
9. Oleribe OO, Momoh J, Uzochukwu BS, Mbofana F, Adebisi A, Barbera T *et al.* Identifying Key Challenges Facing Healthcare Systems In Africa And Potential Solutions. *Int J Gen Med.* 2019 Nov 6:12:395-403. **PubMed** | **Google Scholar**
10. World Health Organization. Coordination of public health surveillance between points of entry and the national public health surveillance system. 2018. Accessed June 20, 2024.