

PERSPECTIVE ARTICLE

Mpox virus epidemic in Africa: Is Southeast Asia at risk and what preventive measures should the region take? The example of Vietnam

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Abstract

The ongoing epidemic outbreak of mpox virus infection in Africa raises worldwide health concerns due to its potential for rapid international spread. The immediate risk of mpox to Southeast Asian nations, which are geographically distant from the region, is currently low. However, the global experience of COVID-19 has demonstrated that proactive measures are essential to prepare for any potential cases that may arise from travel or trade. A vaccine and antivirals against the mpox virus do exist, yet supply of both is very limited and their access is inequitable. In all but high-income countries, confirmatory molecular diagnostic testing is also not performed routinely by most microbiology diagnostic services, especially those in the mainstream public sector. Therefore, detection, infection control, and prevention rely heavily on community surveillance of suspected cases based on clinical presentation. The potential threat posed to Vietnam, a lower-middle income country in Southeast Asia, illustrates the current inadequacy of epidemiological surveillance and pathogen control. The World Health Organization declaration of mpox as a “public health emergency of international concern” is a global wake-up call to action. The escalation of a virulent and contagious infectious disease in another continent should be very closely monitored by each nation’s public health authorities. Moreover, capacity to rapidly instigate preventive measures relating to transmission routes, exposure settings, and vulnerable populations should be improved.

Keywords: Mpox; Outbreak; Intervention; Vaccine; Infection control; Disease prevention; Vietnam

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1. Introduction

This perspective article addresses a critical and timely issue as the mpox virus poses a significant global health threat, particularly following recent epidemics in Africa. The article focuses on Southeast Asia, a region that has historically been less affected by mpox but is now at risk due to increased long-haul travel and worldwide interconnectedness. In light of the evolving epidemiological landscape, concrete recommendations for regional prevention and control are provided. Vietnam is specifically highlighted as a case study, considering the unique socio-cultural and healthcare contexts, and examining the country’s current incidence and outbreak preparedness.

2. Clinical manifestations of mpox

Mpox, formerly known as monkeypox, is a viral zoonotic disease caused by infection with the monkeypox orthopoxvirus (MPXV) that was discovered in 1958, with the first human case of mpox recorded in 1970 in the Democratic Republic of the Congo.¹ While its clinical presentation is similar to that of the related but now eradicated smallpox, mpox has a notably lower mortality rate. Typical symptoms include a skin rash that lasts 2 – 4 weeks, accompanied by a fever, headache, myalgia, back pain, lethargy, and lymphadenopathy. The rash often manifests as small, fluid- or pus-filled blisters or open sores that may be painful, appearing on the face, hands, feet, groin, and genital or anal areas. The mpox rash is sometimes confused for chickenpox, shingles, or herpes.² Individuals experiencing symptoms should seek medical attention promptly for proper examination and treatment. According to the World Health Organization (WHO) data, up to 11% of mpox cases result in death, depending on the clade of MPXV.³ Debilitating, potentially fatal complications include secondary infections, bronchopneumonia, sepsis, encephalitis, corneal infection, and vision loss. Children, pregnant women, and people with weakened immune systems, such as the elderly or immunocompromised, are all at higher risk of complications.⁴

3. Diagnostic tests for mpox

The current diagnostic screening methods for mpox rely primarily on molecular techniques, particularly real-time reverse transcription polymerase chain reaction (PCR), which is recognized as the gold standard for confirming mpox infection. This method allows for rapid, sensitive, and specific detection of MPXV from clinical specimens such as skin lesions, crusts, and mucosal swabs^{5,6} and would be readily available in most high-income settings. In low-income countries and lower-middle-income countries (LICs and LMICs, respectively), however, PCR testing is often hindered by the lack of adequate laboratory facilities and trained personnel.^{7,8} This includes sub-Saharan African and Southeast Asian nations. In response to these challenges, alternative diagnostic methods are being developed. For instance, rapid diagnostic tests and loop-mediated isothermal amplification techniques provide quicker results and are more suitable for point-of-care settings.^{7,8} Rapid diagnostic tests, in particular, aim to enhance accessibility and reduce the reliance on complex laboratory setups, which can be scarce in resource-limited environments.^{8,9} Serological tests, while less common as standalone diagnostics due to their limited specificity, can provide supplementary information regarding antibody responses, especially in cases of suspected co-infections of MPXV with other viral pathogens.¹⁰ The integration of

mobile health technologies and artificial intelligence can facilitate remote consultations and enhance the training of healthcare workers to recognize mpox symptoms, thereby improving early detection and response.^{11,12}

4. Virus genetics and transmission epidemiology

Classified into two main clades, I and II, MPXV has been endemic to Central and West Africa, respectively, for several decades.¹³ Recent distinct outbreaks of clades Ib and IIb have demonstrated their capacity to affect non-endemic regions, including Europe, Asia, and the Americas, highlighting the need for global vigilance.^{14–16} The transmission dynamics may vary based on the clade involved, necessitating tailored interventions.^{17,18} The milder clade IIb has shown a higher propensity for human-to-human transmission, particularly among specific populations, such as men who have sex with men (MSM).^{19–21} This indicates that MPXV is likely transmitted primarily through close or intimate physical contact and possibly also through sexual activity involving seminal or vaginal fluids. This necessitates comprehensive public health strategies to mitigate risks, especially in densely populated urban areas.^{22,23} Understanding the clade-specific characteristics of MPXV is crucial for effective epidemiological surveillance, diagnosis, and treatment.²⁴ Moreover, ongoing genomic surveillance and research into emerging MPXV clades are essential for controlling current outbreaks and preventing further spread, especially among vulnerable populations.^{17,25,26}

5. Epidemic alert in Africa

On August 14, 2024, the WHO declared mpox a “public health emergency of international concern,” its highest level of alert.²⁷ This does not mean that this mpox outbreak has attained pandemic status; instead, the WHO designated it so to prevent it from becoming one. This step was taken amid a surge in incidence of MPXV clade Ib, endemic in the Democratic Republic of the Congo, which is believed to be a more virulent variant that can spread through skin-to-skin contact.²⁸ This led to confirmed detection in the neighboring countries of Burundi, Kenya, Rwanda, and Uganda, which did not have prior reported cases of mpox or had hitherto recorded only a handful of imported cases.²⁹ This is the second time such a declaration has been made regarding mpox following the abrupt and significant MPXV clade IIb outbreak in 2022 – 2023,³⁰ before when it was a recognized but rare and neglected disease. This is because in its central African heartland MPXV was for many decades acquired mainly zoonotically through close contact with wild mammals, especially through handling bush meat, but apparently, there was no sustained human-to-human transmission.³¹

6. Threat to other regions

In light of the volume and speed of international travel and trade, it is evident that mpox can no longer be considered a public health threat that is restricted to Africa.³² Due to new mutations that enhance spread between people, cases caused by MPXV clade 1b are expected to reach beyond the continent's currently affected locations if all core capacity requirements for surveillance and response and for designated ports, airports and ground crossings are not in place in a specific country.³³ A separate epidemic of the earlier MPXV clade IIb variant is also continuing to spread globally, although at lower levels, with more than 100 nations currently reporting infections.³⁴ Hence, countries in all regions should implement precautionary measures, such as enhancing surveillance systems for early detection of cases and promoting public awareness campaigns about mpox symptoms and transmission routes.^{15,35,36} International collaboration and information sharing will be crucial in managing potential outbreaks and ensuring a coordinated response.^{37,38}

7. Vaccination: History, rationale, and supply

The recent increasing incidence of mpox may be explained in part by MPXV being a close relative of smallpox virus. Thus, smallpox vaccines afford a degree of protection against mpox.³⁹ However, most of the world has never been vaccinated against smallpox and hence has no cross-immunity to mpox.⁴⁰ This is an unforeseen and extremely unfortunate paradox of smallpox eradication in 1980, the only infectious disease to achieve this distinction.⁴¹ Moreover, rapidly waning immunity from historical smallpox vaccination, which ceased globally over four decades ago, may even increase susceptibility to mpox.⁴² This is an important consideration for vaccination strategies against mpox, particularly for middle-aged and older members of high-risk populations.

Due to the cross-reactivity with smallpox, a vaccine that is effective against mpox already exists,⁴³ licensed as either Imvamune, Imvanex, or Jynneos, depending on the territory. The vaccine is administered as an intradermal injection for people of 18 years and older and as a subcutaneous injection for people under 18 years. Optimal protection is afforded when two doses are given at least 28 days apart, becoming fully effective 2 weeks after the second dose. However, this vaccine is in short supply and global distribution is not equitable.⁴⁴ Africa should rightly take priority over other regions in receiving the promised millions of doses and other allocated resources to control the public health emergency at source. The WHO approval, which is required before vaccine donations can start to be

distributed, was granted only on September 13, 2024.⁴⁵ Meanwhile, the vaccine has been stockpiled in the U.S. and Europe, primarily in preparation for a potential biological weapon attack using a poxvirus. When infectious disease outbreaks have occurred in recent decades, LICs and LMICs have been consistently the last to gain access to vaccines, diagnostics, and treatments, as demonstrated by HIV/AIDS, Ebola, and most recently severe acute respiratory syndrome coronavirus (SARS-CoV)-2.^{46,47}

8. Recommendations on preventive measures

Preventive measures against mpox in Southeast Asia are crucial, especially in light of the region's vulnerability to outbreaks due to increased international travel and urbanization. The strategies employed focus on vaccination, public health education, surveillance, and community engagement. This multifaceted approach aims to mitigate risk of outbreaks and protect vulnerable populations.

8.1. Vaccination

Mpox vaccines such as Jynneos are being promoted for pre-exposure prophylaxis, particularly among high-risk populations, including MSM and healthcare workers.⁴⁸⁻⁵⁰ Vaccination campaigns aim to increase coverage and address vaccine hesitancy through targeted communication strategies that emphasize the importance and safety of vaccination.^{49,51} However, as discussed above, mpox vaccine availability is currently restricted in LICs and LMICs, including those in Southeast Asia. To fill this deficit, the administration of smallpox vaccines, which have shown cross-protective efficacy against mpox, is an emergency preventive measure. With either vaccine, ring vaccination, a strategy to prevent the spread of MPXV that involves vaccinating people who are in close contact with someone who has mpox, may be used to contain the spread of mpox.⁵² This strategy was used to help eradicate smallpox.

8.2. Public health education

Raising awareness about mpox, its transmission, and preventive measures is essential. Educational campaigns are designed to inform the public about recognizing symptoms, the importance of vaccination, and safe practices to reduce exposure risk.⁵³⁻⁵⁵ These campaigns often target specific communities, particularly those at higher risk, to ensure that information is accessible and culturally relevant.^{56,57}

8.3. Surveillance and early detection

Enhanced clinical surveillance systems are being implemented to monitor mpox cases and identify

outbreaks promptly. This includes training healthcare professionals to recognize mpox symptoms and report suspected cases.^{58,59} Rapid diagnostic test capabilities are also being developed to facilitate quick identification of cases, which is vital for controlling potential outbreaks.⁶⁰ At present, there is limited environmental surveillance across the region, such as detection of MPXV in sewage samples. However, in some jurisdictions, the technology for virus surveillance in wastewater is available, predicated on methodologies developed for SARS-CoV-2.⁶¹

8.4. Community engagement

Engaging local communities in preventive efforts is critical. This includes partnerships with community-based organizations to facilitate vaccination drives and educational workshops.^{56,59} Community involvement helps to build trust and encourages individuals to participate in preventive measures without stigma.

8.5. Travel precautions

Given the potential for mpox to spread through international travel, public health authorities in Southeast Asia are emphasizing travel advisories and precautions for travelers returning from affected regions.⁵⁹ This includes monitoring for symptoms and encouraging travelers to seek medical advice if they exhibit signs of infection.

9. Situation in Vietnam

In Southeast Asia, Vietnam provides a prime example of a country that coped notably well with the COVID-19 pandemic.⁶² The Vietnam Government Ministry of Health has a respected and robust emergency outbreak preparedness policy, which will be tested again in the face of an elevated threat from mpox.⁵⁹ Since early 2023, the southern part of the country has reported 202 cases of mpox,⁶³ all identified as MPXV clade IIB, with most incidence recorded in Ho Chi Minh City (HCMC), the largest city. While 150 cases were reported in 2023, none resulted in patient death. Yet, of the 49 cases emerging in 2024 up to mid-September, eight have had a fatal outcome. HCMC has accounted for 156 of the total 199 cases and six of the eight fatalities.⁶⁴ To date, all mpox patients in HCMC have been men aged from 18 to 53 years, with 83.97% (131/156) identifying as a member of the MSM community. Men in the age range of 30 – 39 years represent 46.15% (72/156) of the city's mpox cases. Notably, 54.77% (109/199) of those diagnosed with mpox were also found to be HIV-positive, and 7.04% (14/199) had been taking pre-exposure prophylaxis for HIV prevention.⁶⁵

The HCMC Department of Health, in association with the Pasteur Institute, has asserted that it is actively

monitoring the mpox outbreak through community surveillance and at the city's entry points.⁶⁶ The capacity for laboratory testing is currently limited, so monitoring is reliant on suspected cases, based on a clinical definition. The authorities have highlighted that within its jurisdiction, MPXV is transmitted primarily within the MSM community through unsafe sexual practices. However, the newer and more severe clade Ib variant, recently identified by the WHO and believed to spread more easily through close contact,⁶⁷ including sexual activity and inhalation of respiratory aerosols, has not yet been detected in Vietnam.⁵⁹

10. Conclusion

As past behavior best predicts future actions, Vietnam, along with nations of similar economic status in Southeast Asia that are not prioritized for vaccine donations, should make plans for combating mpox without any realistic prospect of vaccine access in the foreseeable future.⁶⁸ Furthermore, sourcing adequate diagnostic tests and supplies of antiviral treatments will require renewed political commitment and financial investment. We should expect to see continued spread of clade IIB mpox infections throughout this outbreak of MPXV clade Ib. It is to be hoped that the currently limited vaccination of targeted at-risk groups, combined with a concerted public health education drive to promote behavioral changes, together with other preventive recommendations mentioned here, will slow further spread and flatten the epidemiological curve.

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