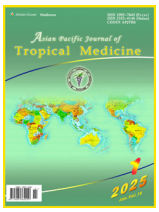

Perspective

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Mpox global health crisis: Implications and actions

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The risk of new pathogen emergence is constantly increasing due to several factors, including the expansion and exploration of previously uninhabited regions, increased global trade, tourism, climate change and others. Recently, monkeypox (mpox) cases have been increasing, causing alarm as the cases are reported from countries where the disease is not endemic. Mpox virus is an emerging pathogen responsible for human mpox. It is an enveloped DNA virus belonging to the family Poxviridae. This virus was first identified in 1970 in the Democratic Republic of the Congo (DRC) and most of the cases were reported from DRC and Nigeria before 2022[1]. In 2003, the virus was reported in the United States of America (USA) and since 2022, cases were reported in multiple non-endemic countries[2]. As of June 30, 2024, 99 176 mpox cases were reported worldwide, resulting in 208 deaths. The United States Centers for Disease Control and Prevention (CDC) reported a total of 32063 cases with 58 deaths[3].

The virus is sub-classified into two main genetic groups *i.e.,* clade Ⅰ and clade Ⅱ. Both clade Ⅰ and clade Ⅱ spread through direct contact with the infected animals or humans. Clade Ⅰ virus can cause severe illness, more contagious and associated with high mortality compared to clade Ⅱ. The clade Ⅱb outbreak in 2022 spread to new geographic regions raised concerns and hence as a result, public health emergencies of international concern (PHEIC) was declared by the World Health Organization (WHO) in July 2022, which was later lifted in May 2023[4]. During this outbreak, the virus transmitted mainly through sexual contact specifically among men sex with men (MSM)[5].

The outbreaks of clade Ⅰ mpox were reported in 2023-2024 in DRC including Kinshasa, the capital city and in other countries including Burundi, Rwanda, Uganda and Kenya. Children aged 15 or below are more susceptible to the infection. Two thirds (67%) of suspected cases and more than three quarters (78%) of deaths were reported in those age groups[6]. The increasing number of suspected cases affected with clade Ⅰ mpox virus raises concerns on the potential spread of the virus to other countries. The rapid spread of clade Ⅰ mpox underscores the risk of spreading worldwide if it is not contained effectively. Due to significant upsurge in cases in the DRC and few other countries, the WHO Director-General Dr. Tedros Adhanom Ghebreyesus declared the spread of mpox a PHEIC under the International Health Regulations (2005) on August 14, 2024[7]. This is the second PHEIC declaration related to mpox in the past two years. Similarly, Ebola was declared a PHEIC twice earlier. The WHO Regional Director for Africa Dr. Matshidiso Moeti mentioned that the robust efforts are currently ongoing to combat the spread of mpox across the continent. In view of this outbreak, the WHO has issued recommendations to reduce the spread of the mpox virus. In the last two decades, seven events have been declared PHEIC earlier (Table 1). The primary goal of such declarations is to quickly mobilize international coordination, streamline funding, and accelerate the development of vaccines, therapeutics, and diagnostics for prevention and response, thereby minimizing the public health and societal impacts of the disease.

Table 1. List of outbreak/diseases for which public health emergencies of international concern (PHEIC) declaration have been made by the WHO (as of August 22, 2024).

PHEIC	Date of declaration	Date of termination
H1N1	25 April 2009	10 August 2010
Polio	5 May 2014	PHEIC still in place
Ebola	8 August 2014	29 March 2016
Zika	1 February 2016	18 November 2016
Ebola	17 July 2019	26 June 2020
COVID-19	30 January 2020	5 May 2023
Mpox	23 July 2022	11 May 2023
Mpox	14 August 2024	PHEIC still in place

There are currently two vaccines available for mpox such as Jynneos® vaccine and the ACAM2000® vaccine[8]. In addition to these vaccines, other candidates are also in development. Notably,

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BioNTech is developing two candidate vaccines: a quadrivalent vaccine (BNT166a) that encodes MPXV antigens A35, B6, M1, and H3, and a trivalent vaccine (BNT166c) without H3 antigen. The preclinical studies have demonstrated the protective efficacy of these vaccines in animal models. Clinical trials for BNT166 are currently underway (NCT05988203) to further assess their safety and efficacy in humans.

Although Asian countries have not reported a significant number of cases so far, it is essential to closely monitor the situation. The COVID-19 pandemic exposed severe challenges in healthcare infrastructures worldwide, highlighting vulnerabilities and the need for robust and adaptive response systems to protect from any emerging threats effectively[9]. The key elements that are vital to follow regarding the upsurge of mpox are the establishment of robust mechanisms for coordinating international and national responses to the mpox outbreak, ensuring that all stakeholders, including health authorities, emergency response teams and partner organizations are directed to work in a cooperative and efficient manner[10]. This involves strengthening surveillance systems to monitor the spread of mpox by improving laboratory diagnostics, sharing data and resources between countries in order to ensure accurate and timely detection of cases as well as follow-up on the course of outbreaks. The development and implementation strategies to provide safe clinical care for mpox patients including adequate healthcare facilities and training healthcare professionals on the latest treatment protocols and providing them with personal protective equipment are also vital. The management of international travel and border controls are important to reduce the spread of mpox by implementing safety measures such as health screening at entry ports, advisory to travelers on preventive practices, and coordinating with border agencies for monitoring and supporting travelers from affected regions. It also includes updating travel advisories and guidance based on the situation in order to minimize the risk of mpox spread. Vaccination efforts including the deployment of the available vaccines and accelerating the development and distribution of new vaccine candidates and getting them available for high-risk populations are important. Further, effective risk communication to the public and engaging communities in preventive measures and encouraging community participation in health interventions are critical. It is also necessary to identify and address the gaps in research related to mpox during and after outbreaks. This includes studies to better understand the virus, its transmission, and its impact, as well as developing new tools and interventions to against the virus. Overall, coordinated action is crucial to mitigate the risks posed by mpox and other emerging pathogens.

Conflict of interest statement

The authors declare that there are no conflicts of interest.

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