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MPOX OUTBREAK INVESTIGATION AMONG HIV-POSITIVE PATIENTS IN YOGYAKARTA CITY, INDONESIA, 2024

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Abstract: In July 2022, WHO declared mpox as a Public Health Emergency of International Concern (PHEIC) due to its rapid spread and caused outbreaks worldwide. In December 2023, an outbreak of mpox infections occurred in Yogyakarta City. The investigation aimed to explore sociodemographic and risk factors of the outbreak -and recommend control measures. A descriptive study was conducted from December 6, 2023, to March 2, 2024. Active case finding through direct interviews with the cases followed by contact tracing. Cases defined as individuals presenting with skin rashes include single or multiple lesions on the anogenital area or other areas of the body, for which the rash is not caused by other diseases and confirmed through diagnostic tests using Polymerase Chain Reaction (PCR). Two confirmed cases of mpox were found without an epidemiological link with zero death. Both cases were 35 and 34 years-old males with a history of HIV-positive under regular ARV treatment, experiencing fever, lesions, anogenital pain, fatigue, and diarrhea. One of them had syphilis (50%). Risk factors include sexual orientation as a man who has sex with men (MSM) and bisexual, with no history of travelling abroad. During treatment, they were instructed to self-isolation along with close contacts, including sexual partners. There has been local transmission of mpox in Yogyakarta City, especially among key populations. Health authorities should increase awareness, enhance surveillance, case detection and health promotion to limit the spread of the disease.

Keyword: mpox; zoonosis; outbreak; HIV

Introduction

Mpox, formerly known as monkeypox, is a zoonotic disease caused by a virus of the genus Orthopoxvirus. The disease was first identified in humans in the Democratic Republic of Congo in 1970 and has since caused numerous outbreaks in endemic regions of Central and West Africa. The virus is closely related to the variola virus, which causes smallpox, and shares several clinical characteristics, including fever, skin lesions, and systemic symptoms. Historically, mpox has been confined to endemic regions; however, changes in human behaviour, increased global travel, and ecological factors have contributed to its emergence in non-endemic areas (Ladnyj et al., 1972). However, by 2022, the spread of mpox increased significantly outside the endemic region, with cases reported in more than 70 countries. Therefore, the World Health Organization (WHO) designated mpox as a Public Health Emergency of International Concern (PHEIC) in July 2022. This decision was taken to raise global awareness and accelerate the public health response to control the spread of the disease (Nuzzo et al., 2022).

Mpox transmission can occur through direct contact with skin lesions or body fluids of infected individuals. In addition, contact with contaminated materials, such as clothing or household appliances,

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can also be a source of transmission (Abdullahi et al., 2024). The virus primarily spreads through human-to-human contact, but zoonotic transmission from infected animals remains a potential risk in endemic areas. People with HIV made up 38–50% of the cases in the 2022 multi country mpox outbreak (Mitjà et al., 2023). The major risk factors for infection include close contact with infected individuals, high-risk sexual behaviours, and environmental or social conditions that facilitate viral transmission. The disease can lead to severe complications, especially among immunocompromised individuals, making early diagnosis, prevention efforts, and increased public awareness critical to controlling its spread (Naga et al., 2025).

In Indonesia, the first confirmed mpox case was detected in Jakarta in August 2022 in a man with a history of international travel. Following this initial case, a mpox outbreak spread to six provinces, including the Riau Islands, Banten, Jakarta, West Java, East Java, and the Special Region of Yogyakarta. The increasing number of cases raised concerns regarding local transmission and the potential for further spread within the community. The outbreak in Indonesia highlighted the need for active surveillance, timely intervention, and public health preparedness to minimize the impact of the disease (Indonesia MoH, 2023).

In December 2023, the first suspected case of mpox was identified in Yogyakarta City, prompting an immediate epidemiological investigation. These investigations aimed to understand the characteristics of the outbreak, including sociodemographic factors, and risk factors contributing to disease transmission.

Materials and Methods

The study used a descriptive design. The investigation was conducted from December 6, 2023, to March 2, 2024. The investigation was conducted through the active case-finding method, with direct interviews to the cases where identified cases were directly interviewed to collect information on their disease history, symptoms, and associated risk factors. Contact tracing was then conducted to cases and their close contact, to identify other potentially infected individuals and assess the possibility of further transmission in the community.

Mpox cases are defined as individuals who developed skin rashes, either single or multiple lesions on the anogenital area or other parts of the body, without any other obvious cause. The diagnosis was confirmed through Polymerase Chain Reaction (PCR) testing in the Public Health Laboratory Center (BB Labkesmas) Yogyakarta. This approach enables early identification of cases and implementation of more effective control measures, including isolation and close contact monitoring.

Data collected from Mpox cases included sociodemographic characteristics, risk factors, and contact history with infected individuals. A descriptive analysis was conducted to describe the pattern of disease spread and the factors influencing the incidence of this outbreak.

Results and Discussion

The study identified two confirmed cases of mpox in Yogyakarta City, both of which had no identifiable epidemiological link and zero death. Both cases were male, aged 35 and 34 years, HIV-positive and undergoing regular antiretroviral (ARV) therapy. Both cases present fever symptoms, lesions, anogenital pain, diarrhea and no lymphadenopathy (Table 1). Only one case (50%) with muscle aches. The symptoms reflect the common clinical manifestations of mpox and can vary in severity based on host immunity and comorbid conditions, with immunocompromised individuals, particularly those with HIV, being at higher risk for severe or prolonged illness, as shown in previous studies (Indonesia Ministry of Health, 2023 and Shabil et al., 2025).

Regarding sexual orientation, one individual identified as a man who has sex with men (MSM) (50%), while the other identified as bisexual (50%). Additionally, one case (50%) also experienced syphilis coinfection. The description of risk factors highlights the need for integrated surveillance of sexually transmitted diseases (STD) and mpox in high-risk populations (Russell et al., 2024). No international travel history for the two cases. It suggests that the source of infection likely originated from local transmission, emphasizing the importance of strengthening contact tracing and public health interventions to control the spread of the disease within the community (Oza et al., 2023).

Table 1: Mpox Cases Characteristics

Characteristics	Case 1	Case 2
Sex	Male	Male
Age	35	34
Symptoms		
Fever	Yes	Yes
Lesion	Yes	Yes
Anogenital pain	Yes	Yes
Diarrhea	Yes	Yes
Muscle aches	No	Yes
Lymphadenopathy	No	No
Sex. Orientation	MSM	Bisexual
Travelling Abroad	No	No
Syphilis	Yes	No
HIV-positive	Yes	Yes

Both mpox cases exhibited a moderate severity level, with Case 1 presenting 25 lesions and Case 2 having 26 lesions. These lesions were distributed across multiple body regions, including the face, hands, torso, feet, and genitals, as illustrated in Figure 1. Lesion progression followed the typical pattern from macules to scabs, with complete resolution by the end of isolation. However, studies indicate that in immunocompromised individuals, particularly those with HIV, lesions may persist longer or present atypically, requiring closer monitoring and tailored management. This pattern aligns with previous

studies, where lesions frequently appeared on both exposed and covered areas, particularly in the anogenital region, suggesting potential transmission through close physical or sexual contact (Nelwan et al., 2024).

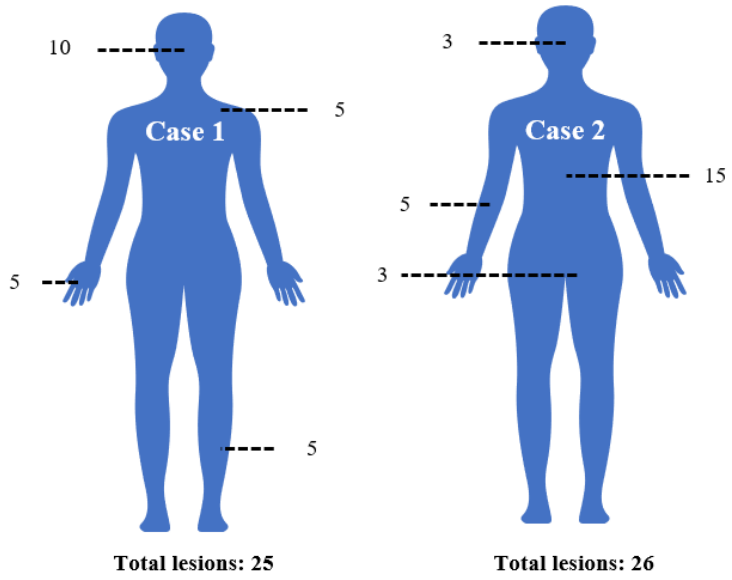

Figure 1: Number of Lesions in mpox Cases

The first case was exposed on November 9, 2023, through sexual contact. The patient developed a fever on November 30, and was identified as a suspected mpox case on December 2, when HIV testing revealed skin lesions. Samples were collected on December 6, and laboratory results confirmed mpox on December 9. The patient and close contacts were isolated until December 16. Meanwhile, the second case had sexual contact on November 23, 2023, and underwent HIV testing on November 14. On December 9, a collaborative awareness event on mpox was held with an HIV activist NGO in Yogyakarta. The patient developed fever and lesions on January 8, 2024, consulted a general practitioner and dermatologist, and was sampled as a suspected case on January 15. Mpox was confirmed on January 16, and isolation ended on January 22, 2024. Figure 2 describes the timeline of mpox cases in Yogyakarta and control measures taken by the Health Office.

PCR testing confirmed the presence of the mpox virus in all cases (100%), with genomic sequencing identifying clade IIb as the causative strain. Clade IIb has been the dominant lineage driving global outbreaks since 2022, exhibiting increased transmissibility and immune evasion due to specific mutations (Pesonel et al., 2025). Epidemiological studies indicate that this clade predominantly affects men who have sex with men, particularly those co-infected with HIV-1/AIDS (D'Angelo et al., 2024), a pattern consistent with the patient profiles in this investigation.

During treatment, both patients were instructed to self-isolate at home to mitigate further transmission. At the same time, close contacts, including sexual partners, were advised to undergo symptom monitoring and quarantine as necessary. Health authorities conducted follow-up assessments to ensure

compliance with isolation protocols and to document clinical progression. Self-isolation and systematic contact monitoring have been established as effective containment measures, particularly in non-endemic regions where mpox demonstrates a high potential for rapid transmission (Sahoo et al., 2025). Both patients exhibited favourable clinical outcomes, with progressive symptom resolution throughout the isolation period. By the conclusion of the follow-up phase, they had fully recovered, with no reported complications or long-term sequelae.

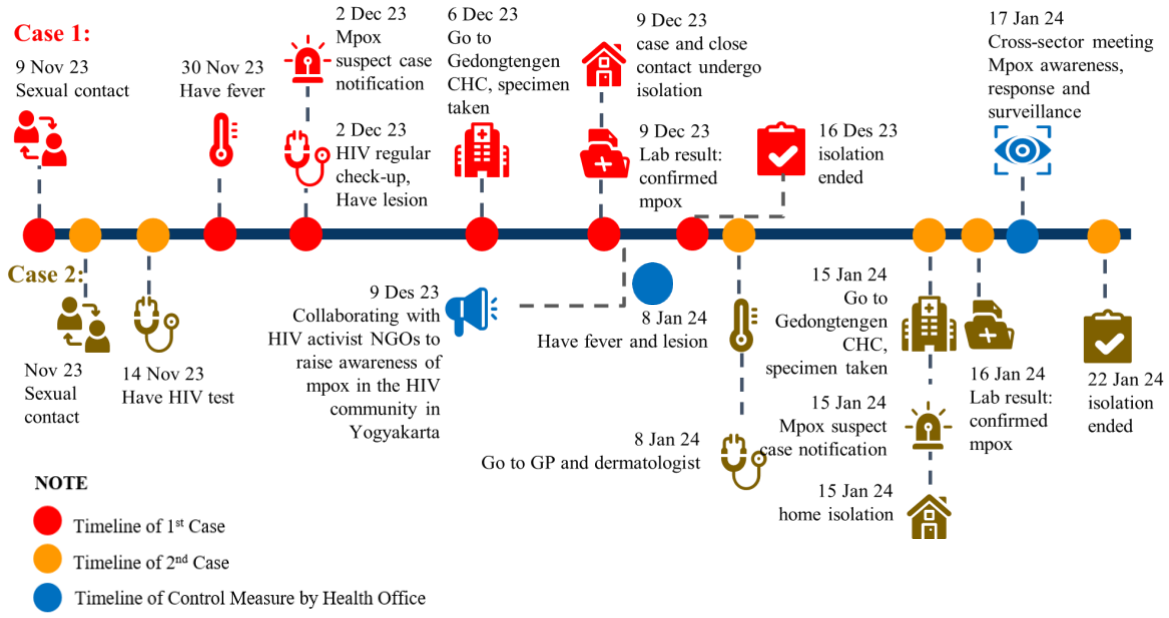

Figure 2. Timeline of mpox Cases in Yogyakarta City

The Provincial Health Office convened a cross-sector meeting of CHCs, DHOs, MoH, health quarantine agencies, and NGOs) on January 17, 2024, to increase awareness, response and surveillance of mpox. Control measures were implemented through contact tracing, monitoring of exposed individuals, and proper isolation and treatment to prevent further spread. Surveillance is strengthened with a more systematic recording and reporting system, including real-time case monitoring to detect transmission trends. In addition, capacity building of health workers in symptom identification, specimen collection, and epidemiologic investigation was carried out to ensure early detection and rapid mitigation of potential case spikes (Aloqaily et al., 2024; Hossain et al., 2025; Mukadi-Bamuleka, 2024; Sahoo et al., 2025).

Community engagement and awareness campaigns are key elements in mpox control, especially in at-risk populations. Stigma in HIV-positive communities can hinder case reporting and delay access to health services, so education efforts need to be strengthened. In collaboration with HIV organizations and advocacy groups, proper information dissemination can increase awareness and encourage early detection and faster response (Humphreys, 2024; Paterson et al., 2025).

The collaboration between health authorities, community organizations, and stakeholders is essential in ensuring a coordinated response. Integration of mpox surveillance with other health services can accelerate case detection and outbreak control. Continuous evaluation of the effectiveness of control

measures is also needed so that the strategies implemented remain adaptive to the dynamics of the disease (Abdulrahim et al., 2025; Mukadi-Bamuleka, 2024).

Conclusion

The study confirmed the mpox outbreak in Yogyakarta with two cases, males aged 34 and 35 years with HIV positive. The risk factor was sexual history contact. To effectively control the outbreak, health authorities should strengthen epidemiological surveillance, optimize case detection mechanisms, and establish strategic partnerships with HIV community-based organizations to implement targeted interventions. Expanding access to vaccines and post-exposure prophylaxis for high-risk populations should be integrated into a comprehensive, evidence-based prevention framework to enhance long-term outbreak mitigation and reduce transmission risk.

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