



Mpox Scenario-Based Human Health Clade I Risk Assessment for the United States

Appendix: Additional Details on Process and Recommendations

Scenario 1: Clade I Surge in Africa

Summary

- Viral group: clade Ib and IiB
- Projected primary population impacted: MSM community, sex workers, and children

Multiple countries across Africa have experienced increased Mpox activity in July and August of 2024, with new detections of clade I and IiB in at least [13 countries](#). This scenario anticipates an increase in mpox transmission, with similar severity of disease for each respective clade, though a faster and stronger surge in the more deadly clade Ib.

For this scenario, we determined the health risk in the United States to the MSM community is [moderate](#), the health risk to the sex workers is [moderate](#), the health risk to healthcare workers is [low](#), the health risk to children is [low](#) and the health risk to the general public is [low](#).

Our confidence in these risk scores is [moderate](#) given the current level of information for each of these factors; historical knowledge from the 2022 US mpox outbreak, including our understanding of the transmission dynamics; current reliability and consistency of data on global spread; and the availability of vaccination and treatment resources.

To minimize the potential for imported cases of clade I in the US and a continued surge in transmission of clade I and IiB mpox in Africa, the CDC and WHO recommend:

- Mass and large gathering event planning and preparedness activities should foster [community-based actions](#) aimed at spreading precise and practical public health advice with a nondiscrimination approach across different media and incorporate educational and awareness-raising initiatives related to mpox and other diseases of concern.
- All individuals with an [increased risk of infection](#) should receive [2 doses of JYNNEOS](#) vaccine.
- Individuals can [reduce their risk](#) by talking with sexual partners about mpox and practicing safer sex and good hygiene.
- Those at increased risk are encouraged to check for symptoms such as a rash with blisters on any part of the body (often starting around the mouth, anus, or genitals), inflammation and pain in the rectum, swollen lymph nodes, and/or fever.

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- Those with any mpox symptoms should seek medical advice from a healthcare professional. They should also get tested, take a break from sex, ask close contacts and sexual partners if they have similar symptoms, and avoid close physical contact.
- [Clinicians should consider](#) mpox when lesions consistent with mpox are observed in a patient, even if an alternate etiology (eg, herpes simplex virus, syphilis) is considered more likely. Clinicians and other healthcare professionals should also [wear all recommended personal protective equipment](#) (PPE) when completing mpox testing.
- People who have been in contact with someone with mpox infection should seek medical advice even if they do not have symptoms. They may be eligible for vaccination, which can [reduce the risk](#) of infection and developing severe disease.

Scenario 2: Sporadic Imported Clade I Cases

Summary

- Viral group: clade Ib and IIb
- Current primary populations impacted: children, sex workers and partners in the Democratic Republic of Congo (DRC)

Unlike clade IIb, which is primarily limited to the MSM community, clade Ib mpox now shows distinct epidemiological and clinical trends. Clade I has predominantly been detected in the DRC, with positive cases in 25 out of 26 provinces, however there have been outbreaks across Africa and cases reported in [Sweden](#), [Pakistan](#), and [Thailand](#) in August, 2024.. Historically, clade I has disproportionately impacted children—both in incidence and severity—a dynamic that remains consistent in the current clade I DRC outbreak. Currently, 67% of cases and 78% of deaths from Clade I in the DRC have [been among persons 15 years or younger](#). [Clade I patients usually present](#) with a more pronounced, diffuse rash, and the virus is more transmissible than clade IIb. Infections with clade I mpox are also more severe and more deadly than infections with clade IIb. The fatality risk ranges from [1.4 to more than 10%](#), whereas the [CFR for clade II](#) is between 0.1% [and 4%](#). The exact animal reservoirs and routes of transmission placing the most affected [populations at risk for clade I mpox](#) currently remain unclear, although it is expected that many routes (zoonotic, household exposure, and sexual transmission) are the key drivers. whereas the [CFR for clade II](#) is between 0.1% [and 4%](#). The exact animal reservoirs and routes of transmission placing the most affected [populations at risk for clade I mpox](#) currently remain unclear, although it is expected that many routes (zoonotic, household exposure, and sexual transmission) are the key drivers.

The DRC declared mpox a national epidemic in December 2022 due to rising numbers of cases and deaths. Most cases have been reported in children aged 15 years and younger. The CFR is significantly higher among children than among adults, particularly infants younger than 1 year.

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[Africa CDC reports](#) that almost 70% of the cases in DRC are in children younger than 15 and that the caseload in this age group accounts for 85% of all deaths. [Epidemiologists have also documented](#) heterosexual transmission in the DRC epidemic, particularly involving [sex workers](#), constituting another epidemiological difference compared to the global clade II epidemic.

In July and August of 2024, [clade I cases have been detected](#) in Central African Republic, Gabon, Burundi, Cameroon, Congo, Ghana, Liberia, and Rwanda, increasing the risk of importation of sporadic cases of clade I Mpox to the US. Outside of the African continent, clade I cases have also been detected in [Sweden](#), [Pakistan](#), and [Thailand](#), indicating that global spread is already happening.

For this scenario, we determined the health risk in the United States to the MSM community is [moderate](#), the health risk to sex workers is [moderate](#), the health risk to healthcare workers is [low](#), the health risk to children is [low-moderate](#), and the health risk to the general public is [low](#).

Our confidence in these risk scores is [low](#) given the current level of information for each of these factors.

To minimize the risk of additional clade I mpox outbreaks, the CDC and WHO recommend:

- [Continuing efforts](#) to [enhance case detection](#) and surveillance in the DRC and neighboring countries.
- [Continuing distribution](#) of sample collection and transport kits to reference hospitals and logistical support for collecting, transporting, and examining samples from suspected cases in Kenge, Kinshasa, and other affected areas.
- [Continuing provision](#) of funding, personnel support, and technical assistance to the DRC
- Clinicians and public health practitioners in the US and globally should be [alert for possible cases in travelers](#) from DRC and request clade-specific testing.

Scenario 3: Sustained Clade I Transmission in the US

Summary

- Viral group: clade Ib and Iib
- Projected primary populations impacted: MSM community, sex workers, children

While there have not been any documented cases of clade Ib within the US thus far, introduction of clade Ib to the US would be novel and could result in a larger outbreak affecting different vulnerable groups than those primarily impacted by clade Iib mpox virus. This could significantly change the risk levels should such a scenario occur in the US. The potential health consequences for a broader range of populations, including children, warrant additional preparedness efforts. Surveillance and reporting must increase, both across Africa and the US.

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Although clade Ib and clade Iib are genetically similar enough that vaccines and treatments are expected to be effective, it is not well understood how prior infection with clade Iib or vaccination might protect from infection with or complications from clade I. The antiviral drug Tecoverimat that is used to reduce symptoms and shorten the length of infection for clade Iib mpox infections, has produced no medical benefit when used in clade Ib cases.

The drivers and modes of transmission of clade Ib mpox are still not well understood, making it challenging to predict the potential trajectory of a US epidemic scenario. Based on existing knowledge of the current clade Ia and Ib outbreak in the DRC, we know the most at-risk populations include the MSM community, sex workers, and children. If the US experienced a sustained clade Ib outbreak, we believe those in the MSM community and sex workers who engage in higher risk sexual conduct and close contact would be more likely to be infected. These populations might also experience more severe disease. We expect a lower likelihood of children becoming infected with mpox clade Ib in the US because the main risk factors for transmission to children in the DRC are reported to be exposure to 1) animal reservoirs, 2) higher numbers of household occupants, and 3) limited resources for sanitation and hygiene, factors that are not expected to be as relevant in the US. Although the risk of transmission to US children is expected to be lower in the event of a clade Ib outbreak than in the current DRC epidemic, the consequences would be similarly high due to the increased morbidity and mortality rates among children aged 15 and younger with suspected clade I mpox in the DRC. Therefore, the health risk level for children would also increase, as seen in the below table.

For this scenario, we determined the health risk in the United States to the MSM community is moderate-high, the health risk to sex workers is moderate-high, the health risk to healthcare workers is low, the health risk to children is moderate-high, and the health risk to the general public is low-moderate.

Our confidence in these risk scores is low.

To minimize risk of a clade Ib mpox outbreak in the US, the CDC and WHO recommend:

- All individuals with an increased risk of infection should receive 2 doses of JYNNEOS vaccine.
- US clinicians and public health practitioners should be alert for possible cases in travelers from DRC and other impacted countries and request clade-specific testing.

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