

Mpox in Africa (2022-2024)

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Background

In December 2022, the Democratic Republic of Congo (DRC) declared a national outbreak of mpox as cases increased and spread at rapid rates¹. While the DRC is the most affected country in Africa, comprising at least 96% of mpox cases on the continent, twelve other African countries have reported cases in 2024 including previously non-endemic countries^{2,3}. Overall, mpox cases in Africa have increased by 160% in 2024 compared to 2023⁴. Mpox is a zoonotic infectious disease caused by the monkeypox virus (MPXV)⁵. It is closely related to smallpox caused by the variola virus which is part of the same genus as MPXV; the *Orthopoxvirus* genus⁶. Mpox was first discovered in the DRC (formerly Zaire) in 1970 around the same time the last smallpox case was reported^{7,8}. Shortly after several other West and Central African countries began reporting mpox cases with repeated zoonotic spillovers and limited human-human transmission⁸. Before 2022, mpox was endemic to 11 West and Central African countries affected by two distinct clades of the MPXV: clade I (formerly the Central African clade) and clade II (formerly the West African clade) which can be further subcategorised into clade IIa and clade IIb⁹. Clade I MPXV is known to be more deadly with a case-fatality ratio (CFR) of 10.6% compared to a CFR of 3.6% for clade II¹⁰.

Transmission, Clinical Presentation, Diagnosis, and Treatment

Mpox spreads from infected animals to humans or from infected humans to humans through direct contact with skin, bodily fluids, or contaminated objects^{5,11}. Infected pregnant individuals can also transmit the virus to their foetus or newborn¹¹. The incubation period ranges from approximately 1 to 21 days but on average, symptoms present within a week^{5,12}. Individuals suffering from mpox typically develop fever, lymphadenopathy, malaise, muscle aches, and a rash^{5,12,13}. The rash begins as an ulcer which becomes fluid-filled, itchy, and painful, before crusting and falling off as it heals⁵. In most cases, mpox is a self-limiting disease however, in people with a weakened immune system the disease can be fatal and complications such as bacterial skin infections, encephalitis, myocarditis, and eye problems can develop^{5,13}.

The preferred laboratory test for confirming mpox is a polymerase chain reaction (PCR) test to detect viral DNA⁵. Swabs tested are taken directly from the rash⁵. Blood samples are not recommended, and antibody testing cannot distinguish between orthopoxviruses⁵. Laboratory confirmation is necessary as mpox is difficult to distinguish from similar diseases such as measles or herpes⁵. Antivirals such as tecovirimat have been used to treat mpox however, further research is needed to understand their effectiveness^{5,14,15}. Bavarian Nordics Modified Vaccinia Ankara vaccine (MVA-BN) known as JYNNEOS in the US or Imvamune and Imvanex outside the US is a licensed mpox vaccine that is safe and effective however, further research is needed to understand the vaccine's effectiveness in different at-risk groups^{14,16–18}. These vaccines have been recommended for use by the WHO Strategic Advisory Group of Experts on Immunization and from 7 August 2024, Emergency Use Listing of the vaccines enabled GAVI and UNICEF to procure them for distribution, without national regulatory approval^{19–21}.

Global 2022 mpox outbreak

In May 2022, the United Kingdom reported a mpox case in an individual who had recently travelled to mpox endemic Nigeria²². Shortly after, several community-acquired cases with no links to endemic countries were reported²². By July 2022, the World Health Organization (WHO) declared a Public Health Emergency of International Concern (PHEIC) as mpox spread globally²³. The United States (US) became the most affected country with 32,820 cases reported between January 2022 and April 2024²⁴. The global mpox outbreak was driven by clade IIb MPXV and differed in transmission and clinical presentation from what was traditionally known^{5,25}. It spread predominantly via sexual contact and affected men who have sex with men²⁵. Some cases would present with only a few genital lesions before prodromal symptoms such as fever or malaise²⁵. Mpox cases globally began to decline and the PHEIC was no longer in place by May 2023²³.

Mpox in the DRC

Mpox cases in the DRC have increased at an exponential rate since December 2022. From 1 January to 30 July 2024, there were 13,791 cases (2,628 confirmed) and 450 deaths⁴. Individuals less than 15 years old remain the most impacted and represent 68% of total mpox cases and 85% of deaths⁴. Children may be more affected due to their reduced immunity exacerbated by high malnutrition rates and a lack of protection that previously administered smallpox vaccines would have provided to older populations^{26,27}. The DRC is affected by the clade I MPXV strain which has suggested increased lethality¹. Traditionally, transmission mainly occurred via zoonotic spillover events and household contacts in provinces close to tropical rainforests⁸. However, this outbreak has seen sustained human-to-human transmission of mpox clade I and geographical spread to urban provinces including the densely populated capital city, Kinshasa²⁸. Previously, 11 out of 26 provinces in the DRC were affected by mpox but as of July 30, 2024, this has increased to 25 out of the 26 provinces⁴. Concerningly, mpox has spread to highly mobile populations, including displaced people, in Eastern DRC which suffers from ongoing conflict and insecurity^{1,29,30}. By August 2024, mpox crossed beyond DRC borders to neighbouring, previously non-endemic, East African countries (Figure 1)^{4,31–33}.

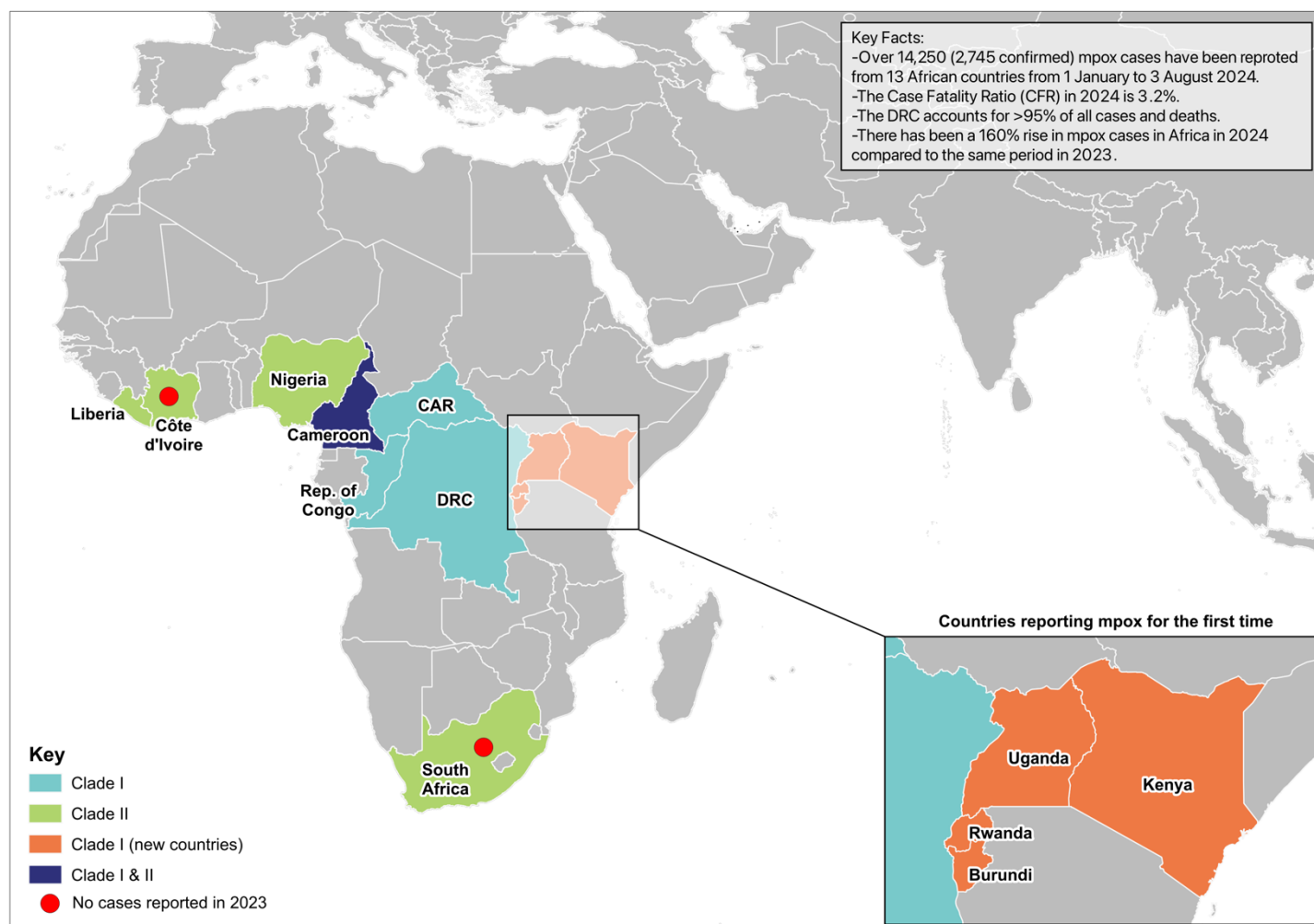


Figure 1: Mpox cases in Africa (2024)

Abbreviations: CAR (Central African Republic); Rep. of Congo (Republic of Congo); DRC (Democratic Republic of Congo)

Map made in QGIS using Natural Earth Data. Data on mpox cases was obtained from the Africa CDC [Epidemic Intelligence Report](#) (16 Aug 2024) and the [Mpox Situation in Africa Report](#) (30 Jul 2024)^{2,4}.

In April 2023, sexual transmission of clade I MPXV was reported for the first time from the Kwango province in DRC²⁸. The case (case 1) was a Belgian male resident who frequently travels to the DRC²⁸. After arriving in the DRC in March 2023, the individual had several sexual encounters (six men and three women)^{28,34}. Five sexual and non-sexual contacts of case 1 tested positive for mpox. Epidemiological investigations reveal that the exposure to MPXV likely occurred in Belgium however genomic sequencing confirms that the cluster of sexually transmitted cases from Kwango is being driven by clade I MPXV²⁸. Belgium has not identified the circulation of clade I MPXV yet³⁵. Between September 2023 and February 2024, South Kivu province in DRC reported clade I MPXV cases driven by sexual transmission, and female professional sex workers were especially affected comprising 29% of cases³⁶. Concerningly, mpox has spread to displaced people in Goma where rates of sexual violence are high increasing the likelihood of spread to victims of sexual violence³⁷.

Genomic sequencing from South Kivu samples obtained between October 2023 and January 2024 revealed a novel variant of clade I MPXV had emerged with APOBEC3-type mutations^{1,38}. This is now referred to as clade Ib. Mutations represent the deletion of a gene in the same position as the clade IIb MPXV and have resulted in failure of the clade I specific RT-PCR diagnostic test recommended by the CDC³⁹. The novel variant is indicative of virus adaptation from sustained human-to-human transmission³⁶. Further research is needed to determine if this novel variant is more transmissible or deadly¹. Where data is available, samples obtained from other provinces in the DRC do not have evidence of this novel variant¹.

Mpox in Africa

Beyond the DRC, the spread of mpox in Africa is alarming. South Africa and Côte d'Ivoire reported clade II MPXV cases in 2024 after not reporting any cases in 2023 in addition to Nigeria, Liberia, and Cameroon that have continued to report clade II MPXV cases in 2024 (Figure 1)^{3,21,40,41}. This highlights the ongoing transmission of clade II MPXV and the continued threat it poses. Even more concerning is the spread of clade I MPXV beyond the DRC to previously non-endemic East Africa. Four countries, Rwanda, Burundi, Uganda, and Kenya have reported mpox for the first time^{3,41}. Cases identified in Rwanda and Uganda had a history of travel to the DRC^{3,41}. The case identified in Kenya was a long-distance driver who had driven from Kampala in Uganda to the Taita-Taveta County in Kenya at the Tanzanian border³. He intended to travel via Tanzania to Rwanda demonstrating the impact that highly mobile populations have on the spread of disease beyond country borders³. Genomic sequencing revealed that cases detected in East Africa have been infected by the novel variant (clade Ib MPXV) mainly circulating in Eastern DRC^{3,41}. Along with DRC, the Central African Republic and the Republic of Congo have reported cases of clade Ia in 2024²¹.

Clade I MPXV outside of Africa

On 15 August 2024, mpox associated with the novel clade Ib MPXV was reported from Sweden^{41,42}. This is the first reported case of clade Ib MPXV outside of Africa^{41,42}. The case is still under investigation, but it is known that they had travelled to an African country where clade Ib is circulating^{41,42}.

Public Health Response

The mpox situation in the DRC and Africa is especially concerning for the following reasons:

- Rapid human-to-human transmission is driving mpox as opposed to zoonotic spillover.
- The reports of sexual transmission associated with clade I MPXV for the first time have introduced a new mode of transmission that puts female sex workers and victims of sexual violence at increased risk.
- Children less than 15 years old are most impacted by mpox and represent the largest portion of deaths.
- A novel variant (clade Ib MPXV) has emerged and there is a lack of understanding about its transmissibility and ability to cause severe disease.
- Mpox has spread to highly mobile populations in Eastern DRC which suffers from ongoing conflict and insecurity. This increases the risk of spread other countries. Four previously non-endemic, East African countries and one European country have already reported clade Ib MPXV cases (most imported from the DRC).
- There is a lack of capacity and medical countermeasures in DRC to control the mpox outbreak and the situation is likely worse than what is being reported.
- Countries including South Africa and Côte d'Ivoire that reported no mpox cases in 2023 are reporting cases in 2024 indicating that the threat of continued global mpox spread is not over.

On 13 August 2024, Africa CDC declared a public health emergency of continental security (Figure 2)⁴³. This is the first time the declaration has been used⁴³. The declaration is designed to empower Africa CDC to coordinate a response and mobilise resources⁴³. The organisation has set up an Incident Management Team to support affected countries and while the situation is concerning, Africa CDC states that there is no need for travel restrictions at this time⁴³. In alignment with the Africa CDC, the WHO declared the mpox outbreak a PHEIC on 14 August 2024^{44,45}. The WHO Director-General emphasised the importance of an internationally coordinated response and UN agencies are working with the governments of affected countries^{44,45}. The WHO developed a regional response plan and anticipates that \$15 million is needed to support surveillance, preparedness, and response^{44,45}. The WHO Contingency Fund for Emergencies has released \$1.45 million so far and appeals are being made for donor support^{44,45}.

The lack of medical countermeasures available is concerning. Africa CDC has called for international solidarity as it states that the continent needs 10 million vaccines but only has 20,000 vaccines⁴⁶. However, plans are in place to support DRC and the wider African continent in obtaining vaccines. These include:

- A 10 million US dollar donation from USAID along with 50,000 vaccines⁴⁷.
- A signed partnership agreement between Africa CDC, the European Commission's Health Emergency Preparedness and Response Authority (HERA), and Bavarian Nordic to provide 215,000 vaccine doses⁴³.
- The WHO-initiated process for Emergency Use Listing (EUL) for mpox vaccines enabling Gavi and UNICEF to procure vaccines and increase access to countries yet to obtain national regulatory approval^{44,45}.
- The WHO invitation to mpox vaccine manufacturers to submit an Expression of Interest for EUL²⁰.

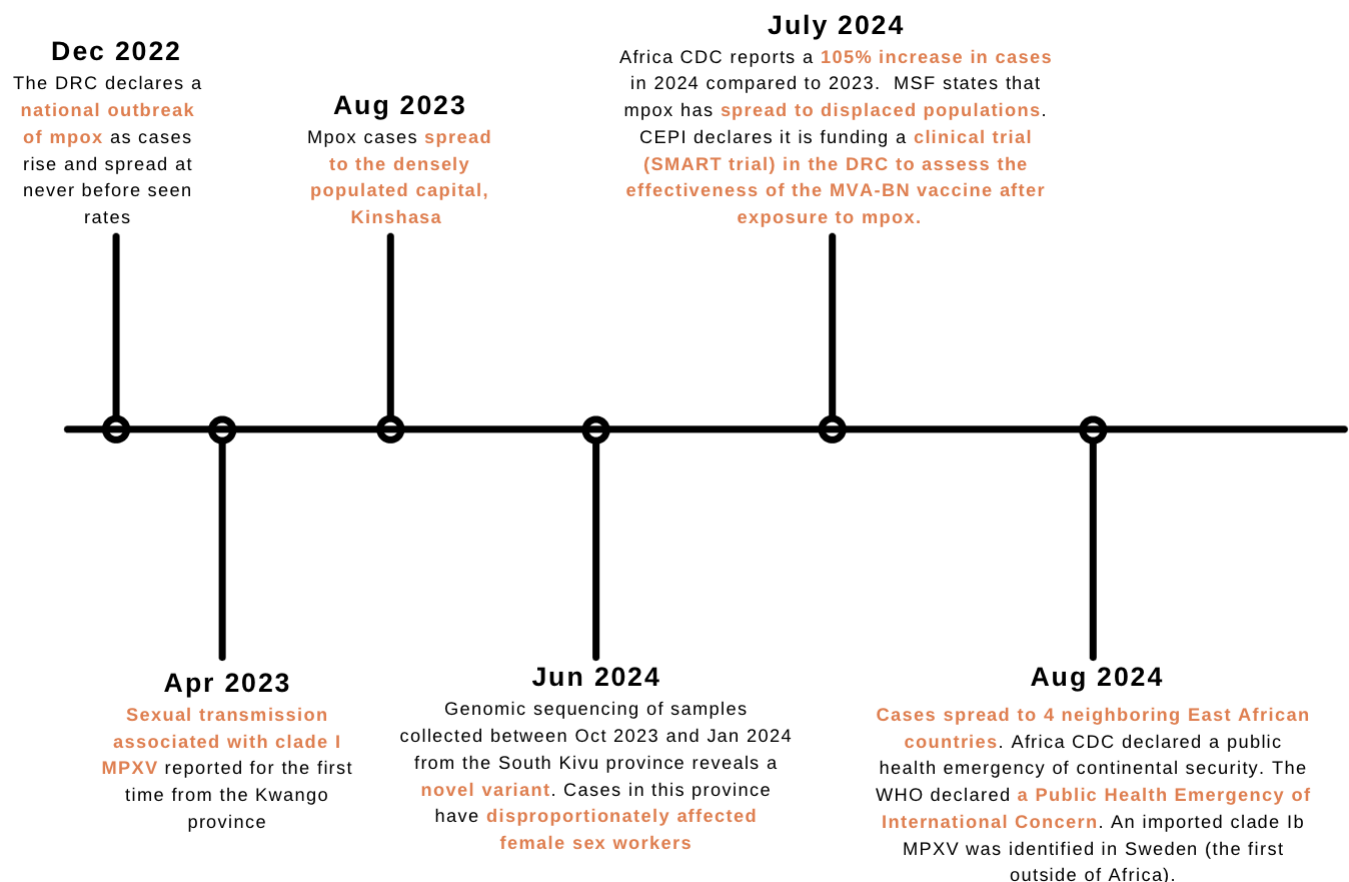


Figure 2: Summary timeline of significant events related to the DRC mpox outbreak

Useful Resources

- Pandemic PACT has our dedicated [Mpox page](#) in the Outbreak section of the website which provides information and analyses of active mpox research and funding globally since 2020.
- The WHO Research & Development Blueprint for Epidemics team has developed vaccine and therapeutic trackers for mpox which can be found in the 'Technical Areas' section of their [webpage](#) on Mpox^{48,49}. The trackers list all vaccines and/or therapeutics currently under investigation^{48,49}. Only one vaccine (MVA-BN) has been licensed and two therapeutics have reached human trials (Tecovirimat (Phase 3) and Brincidofovir (Phase 1))^{48,49}.

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