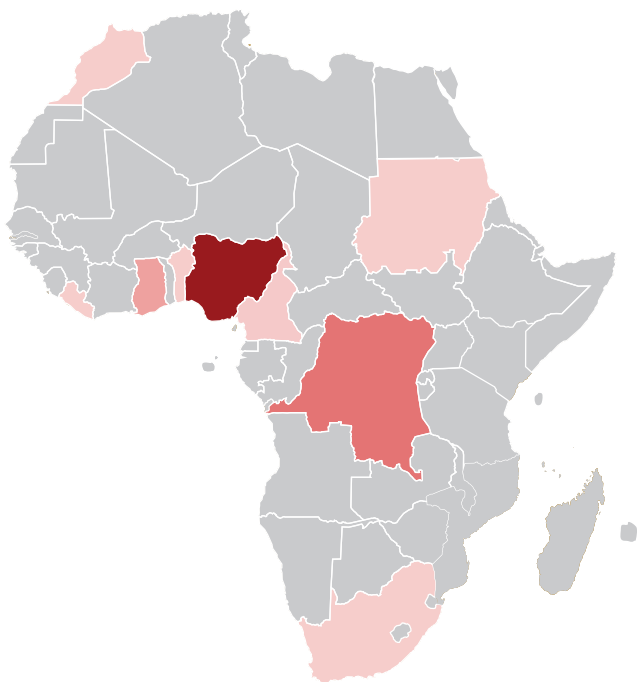


MONKEYPOX TECHNICAL FACTSHEET

KEY FACTS



- Monkeypox is a rare, viral zoonotic disease that is caused by the monkeypox virus
- It occurs primarily in tropical rainforest areas of central and west Africa
- Monkeypox can spread in humans through close contact, often skin-to-skin contact, with an infected person or animal, or with material contaminated with the virus such as clothing, bedding, towels
- Signs and symptoms of monkeypox include fever, rash and swollen lymph nodes
- Monkeypox is usually mild, and most people recover within a few weeks
- Diagnostic testing to confirm cases involves using real-time or conventional polymerase chain reaction
- Vaccines developed to protect against smallpox and monkeypox may be used to prevent and treat monkeypox virus infections and antivirals



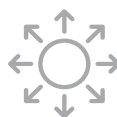
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Figure 1. Map of confirmed monkeypox cases reported from African Union Member States, 1 January to 6 October 2022.



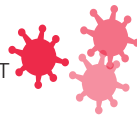
What is Monkeypox?

Monkeypox is a rare viral zoonotic disease caused by a double stranded DNA virus that belongs to the Orthopoxvirus genus of the Poxviridae family. The disease presents with symptoms similar to smallpox but with a lesser severity. Monkeypox was first discovered in 1958 when two outbreaks of a pox-like disease occurred in colonies of monkeys kept for research, hence the name 'monkeypox.' The first human case of monkeypox was recorded in 1970 in the Democratic Republic of the Congo (DRC), which has subsequently spread to other central and western African countries. There are two known clades of the virus: clade I and clade II. The clade I, which is most frequently reported from countries in central Africa, tends to be more severe than clade II. Cameroon is the only country known to harbour both clades.



Distribution in Africa

As of October 2022, monkeypox has been reported from 13 Africa Union (AU) Member States (MS): Benin, Cameroon, Central African Republic, Congo, Democratic Republic of the Congo, Egypt, Ghana, Liberia, Morocco, Mozambique, Nigeria, Sudan, and South Africa. Prior to 2022, the following 11 countries have historically reported cases of monkeypox: Benin, Cameroon, Central African Republic, Congo, Côte d'Ivoire, DRC, Gabon, Liberia, Nigeria, Sierra Leone and South Sudan.



Transmission

Transmission between animals and humans occurs from direct contact with infected blood, bodily fluids, lesions or infected fomites. Person to person transmission mostly is through close contact with respiratory droplets (amplified by sustained face to face contact, skin lesions, infected fomites as well as mother to child transmission via the placenta or at birth through close contact.

Animal Reservoir Host

Although the transmission cycle of monkeypox is not clearly understood nor has the primary reservoir host of the virus identified, the African rope squirrel (*Funisciurus spp.*), among other rodent species, is considered a potential reservoir host of the monkeypox virus in endemic regions in Africa¹. [link](#)

Clinical Features

Symptoms in humans include fever, headache, muscle ache, chills, exhaustion and swollen lymph nodes. Rash develops within 1 -3 days of infection lasting 2-4 weeks. The disease is self-limiting, and the case fatality rate is between 3-6%. Immunosuppressed individuals are thought to be more vulnerable to severe disease.

Signs in animals are not clearly understood but could include lethargy, lack of appetite, coughing, nasal and/or eye secretions or crust, bloating, fever, and pimple- or blister-like skin rash. A veterinarian should promptly be notified when such symptoms are noticed in animals. Additionally, the index of suspicion should be high if an animal becomes sick within 21 days of contact with a probable or confirmed monkeypox case and should be reported immediately.



Surveillance and Contact Tracing

Surveillance remains a key strategy for early detection of infectious diseases, including monkeypox, and provides a basis on which to respond effectively to an outbreak. Monkeypox surveillance strategies should include early detection of cases, tracing of all close contacts of confirmed cases and protecting high-risk populations to prevent further person-to-person transmission. Below are several different types of surveillance systems that can be used for monkeypox.

1. Event-based surveillance

Event-based surveillance (EBS) can be implemented using a One Health approach to strengthen a country's early warning and response capacity. The various modalities are explained in detail within the Africa CDC EBS Framework. For monkeypox it will be important to strengthen the community and facility-based components and utilise a One Health approach in its implementation. Human and animal signal definitions can be developed and incorporated into an existing EBS system to help identify monkeypox-related events.

Examples of signal definitions:

Human

- Any person with a rash, with or without fever or headache or body pain.
- Illness in a healthcare worker after caring for a patient with similar illness.
- Rapid increase of monkeypox cases based on the clinician's judgement or available data.

- Two or more cases of people presenting with similar severe signs/symptoms from the same community, school, or workplace within one week.

Animal

- Any animal or cluster of animals presenting with a rash.



2. Cross-border surveillance

If monkeypox has not been previously detected within your country, enhanced screening at all points of entry (PoE) could potentially help identify travel-related cases. Screening should include detecting symptoms of monkeypox such as rash and fever and strengthening reporting and data sharing mechanisms across borders.

3. Indicator-based surveillance

Where feasible, integrating monkeypox surveillance into existing indicator-based surveillance, especially at the health facility, could quickly help identify new cases of monkeypox.

World Health Organization (WHO) recommended case definitions:

Suspected case: Any person of any age presenting with acute rash or any acute skin lesion accompanied by one or more of: headache, acute fever (38.5°C), lymphadenopathy (swollen lymph nodes), myalgia, back pain and general body weakness and/or any unexplained papular/vesicular rash.

Probable case: Any individual classified as a suspected case, with an epidemiological link to a confirmed case, direct physical contact with skin lesions or contaminated materials, had multiple sexual partners 21 days before onset of symptom, has detectable levels of anti-orthopoxvirus (OPXV) IgM antibody b (during the period of 4 to 56 days after rash onset); or a four-fold rise in IgG antibody titre based on acute (up to day 5-7) and convalescent (day 21 onwards) samples; in the absence of a recent smallpox/monkeypox vaccination or other known exposure to OPXV, has a positive test result for orthopoxviral infection (e.g., OPXV-specific polymerase chain reaction (PCR) without MPXV-specific PCR or sequencing).

Confirmed case: A laboratory confirmed case detected using real time PCR and/or sequencing.

4. Contact tracing

For any suspected, probable, or confirmed case of monkeypox, contact tracing should be initiated immediately. This is especially important to not only reduce the transmission of the disease to other individuals, but also to ensure that any close contacts of confirmed cases receive post exposure prophylaxis (PEP). Following exposures, all contacts should be rapidly identified and followed up for 21 days from the last day of contact with suspected, probable or confirmed cases to quickly detect any symptoms that may occur. This could be done through self-monitoring or by health personnel.



Laboratory Diagnosis

- The Africa CDC recommends strict adherence to infection prevention and control guidelines during specimen collection, transportation, and management in the laboratory ².
- **Monkeypox specimen:** It is recommended to collect skin lesion material, including swabs of lesion surface and/or exudate, roofs from more than one lesion, or lesion crusts. Lesions are to be swabbed vigorously, to ensure adequate viral DNA is collected. The swabs are to be placed in a viral transport media (VTM).
- **Packaging and shipment of monkeypox specimen:** The specimen collected should be stored, refrigerated or frozen within an hour of collection and transported to the laboratory as soon as possible after collection. It is worthy of note that correct handling and storage of specimens during transportation is essential for accurate diagnosis. Transport of specimens should comply with any applicable national and/or international regulations, including the United Nations (UN) Model Regulations and any other applicable regulations depending on the mode of transport being used.



- **Specimen storage:** Specimens collected for monkeypox investigation should be refrigerated (2– 8°C) or frozen (-20°C or lower) within one hour after collection. If transport exceeds 7 days for the sample to be tested, specimens should be stored at -20°C or lower. Longer term specimen storage (>60 days from collection) is recommended at -70°C.
- **Laboratory testing:** Testing for the presence of monkeypox should be performed in appropriately equipped laboratories by staff trained in the relevant technical and safety procedures. Confirmation of monkeypox infection is based on nucleic acid amplification testing (NAAT), using real-time or conventional PCR, for detection of unique sequences of viral DNA. PCR can be used alone, or in combination with sequencing. Additionally, electron microscopy can be used to evaluate the sample for a potential poxvirus, but with the availability of molecular assays and the high technical skills and facility required, this method is not routinely used for the diagnosis of poxviruses. Virus isolation is not recommended as a routine diagnostic procedure and should only be performed in laboratories with appropriate experience and containment facilities. Antibody detection from plasma or serum should not be used alone for diagnosis of monkeypox. However, IgM detection from acutely ill patients or IgG in paired serum samples, collected at least 21 days apart, with the first being collected during the first week of illness, can aid diagnosis if tested samples yield inconclusive results. Recent vaccination may interfere with serological testing
- **Laboratory reagents:** Reagents should be stored according to manufacturer recommendations.
- **Disposal of waste:** All waste that may contain monkeypox virus should be decontaminated before disposal by using an approved method, such as autoclaving or chemical disinfection as approved by the specific laboratory procedures.
- **Result interpretation:** Confirmation of monkeypox infection should consider clinical and epidemiological information. Positive detection using orthopoxvirus PCR assay followed by confirmation of monkeypox via PCR and/or sequencing, or positive detection using monkeypox PCR assay in suspected cases indicates confirmation of monkeypox infection.

Prevention and Control



Infection Prevention and Control

Infection prevention and control (IPC) measures should be implemented using the One Health approach to break the chain of transmission of monkeypox both in community and healthcare settings.

IPC Community Settings

The following guidelines should be considered and adopted in community settings:

- Persons with suspected/confirmed monkeypox diagnosis should not leave the home except to seek health care.
- They should avoid contact with wild or domestic animals (if possible)
- Hand washing with soap and water should be performed by infected persons and contacts
- Suspected/confirmed cases of monkeypox should be isolated in a room from other family members where possible
- Persons with monkeypox infection should wear a surgical mask (especially those who have respiratory symptoms e.g., cough, shortness of breath, sore throat) where feasible
- Disposable gloves should be worn to avoid direct contact with lesions, and these should be disposed after each use
- Skin lesions should be covered to the best extent possible (e.g., long sleeves, trousers/long pants) to minimise risk of contact with others
- Laundry (e.g., linen and clothing), dishes and all contaminated surfaces may be washed with hot water, detergent, and disinfectant (0.5% sodium hypochlorite solution)
- The importance of hand hygiene using soap and water, or alcohol-based sanitizer should be emphasised.



IPC in Healthcare Settings

Standard precautions should always be in place and followed during the care of all patients regardless of diagnosis. For suspected monkeypox cases, in addition to standard precaution, airborne, droplet and contact precautions should be in place until monkeypox is ruled out. Thereafter, contact and droplet precautions should be in place until the crusts heal.

Standard precautions

Healthcare workers (HCW) working in facilities where suspected cases are handled should ensure adherence to the following standard precautions:

- Use contact precautions when in direct contact with patients and to help prevent indirect contact with blood or other bodily fluids and contaminated environment
- Wear gloves to prevent contact with blood, infectious materials, or other potentially contaminated surfaces and items
- Always wear face protection (face mask For N95, goggles or face shield) against droplets
- Observe hand hygiene following the five moments for hand hygiene and wash hands thoroughly under running water before and after a procedure
- Do not recap needles, and handle all sharps with caution
- Safely dispose all sharps in labelled, puncture-proof boxes
- Report to a supervisor immediately if there is a puncture wound or exposure to infectious substances in the healthcare facility
- Correctly contain and dispose of contaminated waste (e.g., dressings) in appropriate colour-coded bags. All waste from patients with suspected/confirmed MPX infection (including personal protective equipment worn in the isolation wards) is classified as highly infectious waste and should be disposed of in red bags
- Take appropriate care when handling soiled laundry and other equipment (e.g., bedding, towels, personal clothing) to avoid contact with lesion material, as some *Orthopox* viruses are known to persist in damp environments.
- Do not touch or handle soiled laundry materials or linen in a manner that may disperse infectious particles
- Clean and decontaminate all used equipment appropriately (e.g., as much as possible, single use devices should be used in care of monkeypox patients.
- Appropriately sterilize and disinfect critical and semi-critical patient care equipment
- Clean non-critical patient care equipment with detergent, warm water and disinfect these with 1.0% Chlorine solution prior to disposal or re-use

Isolation of patients

- Suspected or confirmed monkeypox cases with lesions should be isolated in a room separate from other patients
- Confirmed cases should be segregated from suspected cases
- The isolation room should have signage posted at the door indicating that patient(s) is (are) under contact and droplet precautions
- Precautions should be taken by HCWs to minimise exposure to surrounding persons by restricting access to the isolation room except when necessary
- Isolated patients with extensive lesions and exudates should be covered gently with sheets or light gowns
- Affected individuals should avoid close contact with immunocompromised persons (e.g., diabetics, HIV/AIDS patients, cancer patients etc.) until all crusts have fallen off
- Isolation should be continued until all the lesions have resolved
- Following the discontinuation of isolation precautions, 1% choline solution should be continuously used for decontamination



Personal Protective Equipment

Personal protective equipment (PPE) should be donned in an anteroom before entering the patient's room and should be worn by HCW when handling all patients' contact.

Recommended PPE measures include:

- Use of disposable gown and gloves for patient contact
- Use of N95 (or comparable) filtering disposable respirator especially for extended contact in in-patients' settings. Where a respirator is not available, a face mask (e.g., 3M) should be worn when accessing the isolation room Use of eye protection (e.g., face shields or goggles), as recommended under standard precautions, if medical procedures may lead to splashing or spraying of a patient's body fluids
- All personal protective equipment should be removed carefully and disposed prior to leaving the isolation room where the patient is admitted. Following which, HCWs should either wash their hands with soap and water or use an alcohol- based hand rub

IPC for Veterinarians

- Veterinarians are to consider all animals to be susceptible to monkeypox and understand the inter-species transmission of monkeypox.
- When treating animals with suspected monkeypox, veterinarians should take infection prevention and control procedures to safeguard themselves, their employees, clients, and other animal patients in the clinic.
- A high index of suspicion should exist for any of the following symptoms: cough, fever, conjunctivitis, lack of appetite, respiratory indications, and rash.
- Thorough hand hygiene using the five moments of hand washing should be practised after contact with a sick animal of contaminated surfaces.
- When evaluating monkeypox-infected animals, all personal protective equipment should be worn by veterinarians.
- All used patient-care equipment should be handled in a way that prevents skin and clothing contamination.
- Materials and precautions for cleaning and decontaminating polluted surfaces should be put in place.

IPC for Pet Lovers and Owners

- All pet owners should maintain personal hygiene, such as hand washing with soap and water, and report any suspicious animals to the local veterinary authority
- Anyone infected with monkeypox should avoid contact with animals, especially monkeys, rats, and squirrels
- PPE should be worn by all individuals that care for pets
- Put an end to the use of non-human monkeys in circuses
- Use rodent control measures

Treatment and Care

Many people with monkeypox virus infection have a mild self-limiting disease. There are no specific treatments for monkeypox virus infection currently. However, antivirals developed for the treatment of smallpox may prove to be beneficial against monkeypox. Tecovirimat is approved for the treatment of smallpox in adults and children. It has been shown to decrease the chance of dying, shortens the duration of illness and viral shedding when given in the early course of the disease. Treatment is recommended for people who are severely ill; patients with compromised immune systems like HIV/AIDS patients and people on long term steroids therapy; children, particularly patients younger than 8 years of age; pregnant or breastfeeding women; and people with atopic dermatitis and exfoliative skin conditions. Mental health psychological support services (clinical psychotherapy) should form part of treatment for isolated patients (prior to isolation and during isolation). Assess and monitor for existing mental health ill-health conditions that may worsen during the period of isolation (e.g., anxiety, depression, panic disorders, etc.)



Considerations for special populations

People living with HIV

It is currently unknown if HIV increases risk of infection with monkeypox. However, people living with HIV (PLHIV) who are not virally suppressed may be at increased risk of severe morbidity, prolonged illness, and increased mortality. There is no counter-indication for people on pre-exposure prophylaxis who have monkeypox. PLHIV should follow the same recommendations provided in this document to protect themselves from monkeypox. They should also ensure to be adherent to their antiretroviral drug treatment and present for regular follow-ups at their local clinics for continued care.

Vaccination

Vaccination is a known means of prevention against the disease. **Africa CDC recommends post-exposure prophylaxis (PEP) with the approved vaccine for all close contacts of a confirmed case.** Close contacts include those living in the same household or those who had sex with the case including kissing, hugging and cuddling, sharing of utensils, towels, bedding etc, or came in contact with or touched the rashes on the body of the case³. High-risk populations such as HCWs, immunocompromised individuals and sex workers should also be prioritised for vaccination as mass vaccination is not currently recommended for monkeypox. Two vaccines are available for preventing monkeypox infection: JYNNEOS (Imvamune or Imvanex) and ACAM2000. JYNNEOS is the preferred vaccine for the current outbreak of monkeypox. It is a two-dose vaccine series, administered four weeks apart for maximum effectiveness. A vaccine recipient is considered fully vaccinated two weeks after receiving the second dose. The JYNNEOS vaccine does not cause monkeypox, smallpox, or any significant adverse reaction. Indications for vaccine include known and presume contacts of a case of monkeypox and queer individuals who have had multiple sexual partners in the last 14 days.



Africa CDC Reponses

Africa CDC continues to provide technical support to African Union Member States affected by monkeypox in order to interrupt the chain of transmission of the disease across the continent. The following actions have been conducted since the start of the outbreak:

- Supported Member States to develop monkeypox contingency and response plans. This support is for both countries that have reported outbreaks and also those that are yet to report monkeypox outbreaks. This action tends to improve internal capacities within Member States to prepare and respond to the monkeypox outbreaks as they occur
- Africa CDC is also ensuring that sufficient quality assured testing for monkeypox diagnosis and genomics surveillance are conducted by Member States while ensuring improved research activities through accelerated studies to obtain sufficient information to fill the scientific knowledge gaps on monkeypox
- Africa CDC supports the establishment and maintenance of supply chains for shared resources including IPC, lab supplies and equipment, and medical countermeasures with member states.
- Africa CDC is also strengthening event-based and community surveillance to improve detection and reporting of monkeypox signals and cases in Member States
- Technical support is being provided to Member States to enhance thorough outbreak investigations, improved surveillance to detect more cases and monitoring of contacts
- Laboratory strengthening to improve capacities for diagnosis and laboratory confirmation of monkeypox including genomic sequencing is provided to Member States
- Training and retraining of HCWs on IPC and case management is a priority support provided to Member States by Africa CDC
- Supporting Member States through the deployment of the trained and equipped Africa Volunteer's Health Corps (AVoHC) to respond to the outbreaks
- Bolstering the health systems to effectively manage the outbreak through trainings on Incident Management System (IMS) and overall coordination of response using the One Health approach
- Africa CDC is in the process of procuring/receiving donations for monkeypox vaccines for African Union Member States

3 <https://www.cdc.gov/poxvirus/monkeypox/if-sick/notifying-close-contacts.html>



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