

Surveillance, case investigation and contact tracing for mpox (monkeypox)

Interim guidance

20 March 2024



Key points

- A multi-country outbreak of mpox (formerly monkeypox) has been ongoing since May 2022. The number of cases reported at the global level peaked in August 2022, followed by a steady decline until April 2023 and a smaller increase in cases from June–November 2023. The WHO regions with the most reported laboratory-confirmed cases are the Region of the Americas and the European Region, followed by the Western Pacific and African regions.
- The overall goal of continued mpox surveillance, case investigation and contact tracing is to detect new outbreaks and stop transmission in order to contain the global outbreak, protect people at risk in endemic and new settings, and make progress towards elimination of human-to-human transmission.
- The key objectives of surveillance and case investigation for mpox are to: rapidly identify cases and clusters in order to provide optimal clinical care; isolate cases to prevent further transmission; identify, manage, and follow up contacts to recognize early signs of infection; identify risk groups for infection and for severe disease; protect frontline health workers; and tailor effective control and prevention measures.
- Key actions of the response to the outbreak include informing those who may be most at risk for mpox with accurate information; offering pre- and post-exposure vaccination to individuals at risk; stopping further spread; and protecting vulnerable individuals and frontline workers.
- Clinicians should report suspected cases immediately to relevant public health authorities.
- Probable and confirmed cases of mpox should be reported to WHO through IHR national focal points (NFPs) as early as possible, at least once monthly, including a minimum dataset of epidemiologically relevant information, in line with Article 6 of the International Health Regulations (IHR 2005) and the mpox standing recommendations issued by the Director-General of WHO (August 2023). In areas where mpox is endemic, presumed or suspected cases that meet the national case definition (i.e., cases that are clinically compatible) should also be reported to WHO.
- If mpox is suspected, case investigation should consist of a clinical examination of the patient in a well-ventilated room while using appropriate personal protective equipment (PPE), questioning the patient about possible sources of exposure, and safe collection and dispatch of specimens for laboratory monkeypox virus (MPXV) examination.
- As soon as a suspected case is identified, contact identification and contact tracing should be initiated.
- Contacts of probable and confirmed cases should be monitored, or should self-monitor, daily for any sign or symptom for a period of 21 days from last contact with an infectious case or potentially contaminated materials.
- Quarantine or exclusion from work is not necessary during the contact monitoring period as long as no signs or symptoms develop. WHO encourages contacts to rigorously practice hand hygiene and respiratory etiquette, avoid contact with persons who are immunocompromised or pregnant, avoid or minimize contact with children, and avoid sexual contact with others throughout the 21-day monitoring period. Non-essential travel is discouraged during this period.

Changes from earlier version

This is an updated version of the previous interim guidance on surveillance, case investigation and contact-tracing published on 22 December 2022. After the fifth meeting of the Emergency Committee for the multi-country outbreak of mpox on 10 May 2023, the Director-General of WHO concurred with the Emergency Committee advice that the multi-country outbreak of mpox no longer continued to constitute a Public Health Emergency of International concern (PHEIC). Under the International Health Regulations (2005) (IHR), a Review Committee was convened and advised on standing recommendations for mpox. These were issued by the Director-General on 21 August 2023.¹

The interim guidance has been updated to align with the updated reporting procedures following the issuance of the standing recommendations and includes the most recent information available on mpox.^{2–4} The document contains a new chapter on mpox reinfection and provides reinfection definitions. It has also been adapted to include more considerations relevant to endemic contexts in the African region.

Introduction

This guidance serves to provide interim recommendations for surveillance, case investigation and contact tracing for mpox in the context of the current global multi-country outbreak.²

Mpox is the disease caused by the monkeypox virus (MPXV), historically found in forested areas of East, Central and West Africa, where humans and animals have been infected. Since May 2022, a global outbreak has been ongoing in which the number of mpox cases reported globally rose steadily until the peak in August 2022, followed by a steady decline until April 2023. Since June 2023, there has been a smaller increase in cases, involving more the Western Pacific and South-East Asia regions, as well as Europe and the Americas.⁴ In 2022-23, 117 countries reported mpox cases for the first time, with human-to-human transmission continuing for several months. This is the first time that sustained community transmission of MPXV has occurred outside of previously known affected areas of Africa. During this period, in central Africa the number of reported suspected (clinically compatible) cases has continued to rise steeply in the Democratic Republic of the Congo with the largest number of cases ever reported. Cases are linked to clade I MPXV (formerly Congo Basin clade).⁵

The incubation period of mpox generally ranges from 2 to 21 days, with shorter or longer periods occasionally noted.² During the 2022-23 outbreak, shorter incubation periods have been observed than previously reported.^{6–9} The shorter incubation period could be due to various factors, including differences in the virus strains, methods of data collection, and patient demographics. Typically, the prodromal phase of clinical illness lasts 1-5 days, during which time patients may experience fever, headache, back pain, myalgias, and lymphadenopathy. This is followed by a second phase which typically occurs after the fever subsides, with the appearance of skin and/or mucosal rash, which might include a single or multiple lesions. Typically, the lesions progress through macules, papules, vesicles, and pustules, before crusting over and desquamating over a period of two to four weeks. In the context of the global outbreak due to clade IIb MPXV, patients are presenting with more mucosal lesions than previously described, and often these are localized in the genital or perineal/perianal area as well as in the mouth and on the eyes.¹⁰ Lesions might appear at different stages of progression, and it has been observed that the rash can develop prior to typical prodromal or constitutional symptoms (such as fever or fatigue). Ano-rectal pain and bleeding (e.g., due to proctitis) has also been reported more often in the global outbreak than previously. Lymphadenopathy remains a common feature, usually appearing early in the course of illness.

Human-to-human transmission of mpox can occur through direct contact with infectious lesions of the skin or mucous membranes or body fluids from those lesions. This includes face-to-face, skin-to-skin, mouth-to-mouth or mouth-to-skin contact and respiratory droplets. Exposure to short-range aerosols through prolonged close contact (e.g., with persons who have mpox with respiratory symptoms) may also represent a risk factor for infection. For respiratory transmission, close proximity and extended exposure may be necessary. The MPXV can enter the body through broken skin, mucosal surfaces (e.g. oral, pharyngeal, ocular, genital or anal), or via the respiratory tract. The infectious period can vary, but generally patients are considered infectious from the time of symptom onset until skin lesions have crusted, the scabs have fallen off and a fresh layer of skin has formed underneath. Studies have also suggested that transmission can occur before symptom onset, and emerging evidence continues to be monitored.^{11–14} Transmission can also occur from the environment to humans from contaminated clothing or linens that have infectious skin particles (also described as fomite transmission). If shaken, these particles can disperse into the air and be inhaled or land on broken skin or mucosal membranes, and lead to transmission and infection.^{15,16}

While sexual transmission of mpox was not well understood before this outbreak, the detection of virus in semen and anal swabs of affected patients,^{10,17–20} as well as epidemiological reporting of sexual contact among cases, have clarified that mpox caused by clade IIb MPXV is readily transmissible through sexual activity. In 2023, sexual transmission of mpox due to clade I MPXV has also been documented in sex workers, among men who have sex with men and in women exposed heterosexually in the household,⁵ illustrating the range of sexual networks in which mpox can spread.

During pregnancy, virus can cross the placenta, causing intrauterine exposure of the fetus, complications such as fetal loss or stillbirth, and congenital infection of the infant.²¹

The sudden appearance of mpox in many countries simultaneously, where this disease was not previously reported or where in recent years there have only been cases linked to travel, was unexpected. Transmission, initially amplified by travel and gatherings in several countries, has been sustained mainly through sexual contact among gay men, bisexual men, other men who have sex with men, gender diverse persons and sex workers. These key populations represent those at highest risk of exposure globally, while in African settings where mpox is endemic, children continue to be at risk as well as adults.

Transmission dynamics are not fully elucidated in countries such as the Democratic Republic of the Congo, where the virus has been increasingly circulating in recent years, Nigeria, where cases continue to occur or Sudan, where clade I MPXV was newly reported in 2022. Recent observations suggest that MPXV in these settings is widely transmitted through human-to-human contact, including sexual and non-sexual contact.⁵ While mpox has long been considered a zoonotic disease, confirmation of different modes of animal-to-human transmission remains elusive, which continues to limit the ability to design effective interventions. In such settings, human-to-human transmission is rising and posing a new threat to neighbouring countries.

The MPXV that has been circulating in newly affected countries during the global outbreak belongs to clade IIb. Most of the cases belonged to lineage B of clade IIb; sporadic cases of lineage A and C have also been reported.⁴ Genomic analysis has linked the strains circulating in the multi-country outbreak to the outbreak which began in Nigeria likely in 2017.^{22,23} This is the largest mpox outbreak due to clade II MPXV ever recorded, and although most cases were among adult men, women and children have also been affected.⁴ In addition, newly emerging outbreaks due to clade I MPXV are being detected in areas where mpox had not previously been documented, such as in various provinces of the Democratic Republic of the Congo and in Sudan.^{5,24}

Most individuals with mpox in newly affected countries have not experienced severe disease,^{4,10,18,25,26} although many have developed complications and/or required hospitalization for management of severe pain.^{4,10,25} Persons with immune suppression, due to immunosuppressive treatments, untreated or inadequately managed HIV infection or other medical conditions, are at higher risk of severe disease.^{27–30}

Almost 200 mpox-related deaths have been reported in affected countries in 2022-23 amongst persons with laboratory-confirmed mpox.⁴ More than half of these patients have had underlying risk factors (e.g., being immunocompromised). In contrast, the Democratic Republic of the Congo has reported almost 700 deaths among suspected (clinically compatible) cases in 2023 alone.⁵

The overall goal of surveillance, case investigation and contact tracing is to detect new outbreaks and stop transmission in order to contain the global outbreak, protect people at risk in endemic and new settings, and make progress towards elimination of human-to-human transmission.

Monkeypox virus in animals

The ongoing multi-country outbreak of mpox is sustained through human-to-human transmission. Nevertheless, there are regions on the African continent where the virus has been found in wild animals, and transmission from animals to humans continues to occur, notably in East, Central and West Africa. When transmission from an animal to a human is suspected, it is important to collect information on the exposure as part of the case investigation and collaborate with animal health authorities for further investigation.³ Surveillance of MPXV in animal populations is beyond the scope of this document. Countries are encouraged to report confirmed cases of MPXV infection in animals to the World Organisation for Animal Health (WOAH) with all relevant animal health information as described in Article 1.1.5 of the Terrestrial Animal Health Code³¹, via the country WOAH Delegate.

Surveillance case definitions

The case definitions may be reviewed as more evidence becomes available.

Suspected case:

i) A person who is a contact of a probable or confirmed mpox case in the 21 days before the onset of signs or symptoms, and who presents with any of the following: acute onset of fever ($>38.5^{\circ}\text{C}$), headache, myalgia (muscle pain/body aches), back pain, profound weakness, or fatigue.

OR

ii) A person presenting with an unexplained acute skin rash, mucosal lesions or lymphadenopathy (swollen lymph nodes). The skin rash may include single or multiple lesions in the ano-genital region or elsewhere on the body. Mucosal lesions may include single or multiple oral, conjunctival, urethral, penile, vaginal, or ano-rectal lesions. Ano-rectal lesions can also manifest as ano-rectal inflammation (proctitis), pain and/or bleeding.

AND

for which the following common causes of acute rash or skin lesions do not fully explain the clinical picture: varicella zoster, herpes zoster, measles, herpes simplex, bacterial skin infections, disseminated gonococcus infection, primary or secondary syphilis, chancroid, lymphogranuloma venereum, granuloma inguinale, molluscum contagiosum, allergic reaction (e.g., to plants); and any other locally relevant common causes of papular or vesicular rash.

N.B. It is not necessary to obtain negative laboratory results for listed common causes of rash illness in order to classify a case as suspected. Further, if suspicion of mpox or MPXV infection is high due to either history and/or clinical presentation or possible exposure to a case, the identification of an alternate pathogen which causes rash illness should not preclude testing for MPXV, as co-infections have been identified.

Probable case:

A person presenting with an unexplained acute skin rash, mucosal lesions or lymphadenopathy (swollen lymph nodes). The skin rash may include single or multiple lesions in the ano-genital region or elsewhere on the body. Mucosal lesions may include single or multiple oral, conjunctival, urethral, penile, vaginal, or ano-rectal lesions. Ano-rectal lesions can also manifest as ano-rectal inflammation (proctitis), pain and/or bleeding.

AND

One or more of the following:

- has an epidemiological link^a to a probable or confirmed case of mpox in the 21 days before symptom onset
- has had multiple and/or casual sexual partners in the 21 days before symptom onset
- has a positive test result for orthopoxviral infection (e.g., OPXV-specific PCR without MPXV-specific PCR or sequencing)^b

Confirmed case:

A person with laboratory confirmed MPXV infection by detection of unique sequences of viral DNA by real-time polymerase chain reaction (PCR)^c and/or sequencing.

For further guidance on testing please refer to Laboratory testing for the monkeypox virus: Interim guidance.³²

Discarded case:

A suspected or probable case for which laboratory testing of lesion fluid, skin specimens or crusts by PCR and/or sequencing is negative for MPXV^c. Conversely, a retrospectively detected probable case for which lesion testing can no longer be adequately performed (i.e., after the crusts fall off) and no other specimen is found PCR-positive, would remain classified as a probable case. A suspected or probable case should not be discarded based on a negative result from an oropharyngeal, anal or rectal swab or from a blood test alone.

These case definitions were developed with a view to balance the importance of detecting cases and interrupting chains of transmission, while avoiding an overly sensitive definition that would overburden public health, diagnostic and treatment resources.

^a The person has been exposed to a probable or confirmed monkeypox case. Please see below definition of a contact.

^b PCR on a blood specimen may be unreliable and should also not be used alone as a first line diagnostic test. If blood PCR is negative and was the only test done, this is not sufficient to discard a case that otherwise meets the definition of a suspected or probable case. This applies regardless of whether the blood PCR was for OPXV or MPXV-specific.

^c Confirmation of MPXV infection should consider clinical and epidemiological information. Positive detection using an OPXV PCR assay followed by confirmation of MPXV via PCR and/or sequencing or detection using MPXV PCR assay indicates confirmation of MPXV infection. Positive detection using OPXV PCR assay alone can be considered strongly indicative of MPXV in countries where other OPXVs (such as buffalopox or other OPXV) have not been found. Currently, the WHO mpox case definition considers an OPXV-positive case as a probable case. Countries with no significant co-circulation of OPXVs other than MPXV may adapt testing strategies according to available resources and, in conjunction with the clinical and epidemiological information available, consider OPXV PCR positive cases as confirmed mpox. Vigilance for the remote possibility of a smallpox emergence or other potentially pathogenic OPXV must always be maintained.

Public health authorities should maintain a high degree of vigilance for the possibility of mpox outbreaks in congregate settings such as educational, residential, and correctional facilities and/or in relation to events, gatherings and venues where people may be at risk through different types of exposure. Clinicians should maintain a high index of suspicion for mpox among health workers, sex workers and other key populations including gay men, bisexual men, other men who have sex with men, and transgender individuals and their close contacts.

Public health authorities may adapt these case definitions to suit local circumstances. All efforts should be made to avoid unnecessary stigmatization of individuals and communities potentially affected by mpox.

These definitions are for surveillance purposes and should not be used to guide clinical management. WHO interim guidance for clinical management and infection prevention and control for mpox has been published separately.¹⁵

MPXV reinfection – Case definition

The global outbreak of mpox caused by clade IIb MPXV and ongoing since 2022 is the largest mpox outbreak to date and has resulted in transmission occurring in 117 countries, extending beyond historically affected regions in East, West and Central Africa. The duration of immunity following primary MPXV infection and subsequent protection against reinfection were not known prior to the Clade IIb-related outbreak and continue to be poorly understood.³³ A few case reports and case series have presented instances where individuals previously diagnosed with PCR-confirmed MPXV infection developed the disease and tested PCR-positive for MPXV for a second time.^{34–42} It is currently unclear whether these episodes represent new infections following clinical recovery and the apparent clearance of the virus, a recrudescence of a latent prior infection, or lack of complete viral clearance. Genetic analysis identifying specific viral variants may distinguish a reinfection from recrudescence infection. However, in practice, genomic sequencing is not commonly performed due to limited capacity for genomic sequencing analysis in certain settings, technical constraints stemming from the possible low viral load in subsequent mpox episodes, and difficulties in sequence data interpretation for reinfection determination due to generally slow viral mutation.^{38,39,42}

A lack of consensus on the definition of MPXV reinfection complicates the comparison of reported cases and the compilation of evidence to reach a better understanding to accurately characterize the burden, natural history, clinical characteristics and capacity for onward transmission associated with MPXV reinfection.³³

Additionally, in locations where access to MPXV PCR testing is constrained, a significant number of clinically compatible mpox cases that meet national case definitions remain classified as suspected, and the ability to detect reinfection is hindered due to the absence of documented history of a prior probable or confirmed mpox episode. However, in the context of ongoing local outbreaks with significant numbers of cases, their typical clinical presentation^{15,43} can be very suggestive of mpox. In these settings, WHO encourages countries to define and classify suspected mpox cases with a known epidemiological link to a confirmed case or cluster as probable cases, in line with the above case definitions.

Here we propose definitions for a suspected, probable, and confirmed MPXV reinfection for surveillance purposes. These aim to assist clinicians, researchers, and public health officials by standardizing the reporting of MPXV reinfections across countries.

Given the emerging evidence, these definitions incorporate pragmatic and implementation-focused approaches. The aim is to allow flexibility of use in diverse settings, depending on diagnostic capacity, while

aiming for standardized reporting and better understanding of MPXV reinfections. These definitions are provisional and subject to refinement as more knowledge is accumulated about mpox immunity and infection protection.

Four main elements were considered for these definitions:

- i. A current confirmed mpox diagnosis;
- ii. A documented history of a previous mpox episode, either as a suspected, probable, or confirmed case (WHO mpox case definition);
- iii. A temporal gap of at least three months between two episodes,^{40,44}
- iv. Exclusion of continuous infection, verified by the full clinical resolution of the previous mpox episode. Clinical resolution includes complete disappearance of all signs and symptoms related to the previous episode of mpox, such as fever, headache, muscle aches, backpain, swollen lymph nodes, skin and/or mucosal lesions, or systemic symptoms (eg pulmonary disease), except for long-term sequelae (e.g., blindness, scarring, depigmentation).

Suspected mpox reinfection

- A person who currently meets the criteria for a confirmed case of mpox

AND

- Has a documented history of a previous episode of mpox, as a suspected, probable or confirmed case.
- It is unclear if the person presented full clinical resolution of the previous episode.

Probable mpox reinfection

- A person who currently meets the criteria for a confirmed case of mpox

AND

- Has a documented history of a previous episode of mpox, as a probable or confirmed case.
- Full clinical resolution of the previous mpox episode occurred.
- The time between the resolution of the first episode and the onset of new symptoms is less than three months.

Confirmed mpox reinfection

- A person who currently meets the criteria for a confirmed case of mpox

AND

- Has a documented history of a previous episode of mpox, as a confirmed case.
- Full clinical resolution of the previous mpox episode occurred.
- The time between the resolution of the first episode and the onset of new symptoms is three months or more.
- When possible, strain differentiation is undertaken using genetic sequencing.

OR

- Has a probable mpox reinfection (as described above) with significant strain differentiation between the two MPXV infections (e.g. different lineage and descendant lineages) using genetic sequencing.

If enough MPXV DNA is detected during a subsequent mpox episode, every effort should be made to sequence it to confirm reinfection if there is sequence data from the first episode for comparison.

Considerations for immunosuppressed patients

Mpox disease progression may differ in immunocompromised patients, who may experience prolonged viral persistence and varied clinical manifestations due to impaired viral clearance.⁴⁵ Immunocompromised persons include those with active cancer, transplant recipients, immunodeficiency, and active treatment with immunosuppressive agents. They also include people living with HIV with a current CD4 cell count of <200 cells μ l.

Some immunocompromised individuals have been shown in case series to have severe disseminated forms of the disease including organ involvement. The illness can be prolonged (2-3 months).^{40,44} Therefore, there is less certainty about the potential for latency and the three-month time limit may not be appropriate.

Consequently, when applying these definitions to immunosuppressed patients, a more individualized approach, considering each patient's immune status, clinical presentation, and epidemiological risk factors, is recommended to assess the likelihood of reinfection or recrudescence accurately.

Surveillance

The key objectives of surveillance and case investigation for mpox are to rapidly identify cases and clusters of infections as well as the sources of infection as soon as possible in order to: provide optimal clinical care; isolate cases to prevent further transmission; identify, manage and follow-up contacts to recognize early signs of infection; identify risk groups for infection and for severe disease; protect frontline health workers; and tailor effective control and prevention measures.

In most countries, one case of mpox should be considered an outbreak. Because of the public health risks associated with a single case of mpox, clinicians should report suspected cases immediately to national or local public health authorities according to the case definitions above or nationally tailored case definitions, regardless of whether they are also exploring other potential diagnoses. Probable and confirmed cases of mpox should be reported to WHO through national IHR focal points (NFPs) as early as possible, at least monthly, including a minimum dataset of epidemiologically relevant information, in line with Article 6 of the International Health Regulations (IHR 2005) and the mpox standing recommendations (August 2023).⁴⁶ As noted above, in countries where mpox is endemic, presumed or suspected cases that meet the national case definition (i.e. cases that are clinically compatible with mpox) should also continue to be reported to WHO.

Elements to consider in order to evaluate and describe an outbreak of mpox include the following:

- **Baseline number of cases:** expected average number of cases in time based on historical data
- **Exceeding the baseline:** context-specific departures from baseline which may be linked to modes of transmission
- **Localized increases:** unexpected rise in cases in a specific city, province or region
- **Clusters of cases linked to a gathering or event:** especially gatherings with international participation
- **Changes in disease dynamics:** appearance of new risk factors and/or modes of transmission; a shift in the demographic distribution of reported cases; changes in the severity of disease or the case fatality
- **Monitoring of viral evolution** to identify signatures of potential adaptation to human-to-human transmission as well as mutations that may have an impact on the effectiveness of medical countermeasures such as diagnostics, therapeutics or vaccines.

- **Vulnerability of affected population:** age, prior exposure, underlying medical conditions
- **Public health response:** capacity to respond and contain the outbreak and prevent further spread
- **Availability of countermeasures:** access to diagnostics, vaccines, basic clinical care, specific therapeutics.

Public health authorities and clinicians should be on alert for signals related to patients presenting with mpox. It is important to note that patients may present to various community and other health facility settings including but not limited to: primary care, fever clinics, sexual health services, infectious disease units, obstetrics and gynaecology, emergency departments, and dermatology clinics. Guidance for clinical management, infection prevention and control, and the safe collection of samples for confirmatory testing should therefore be disseminated widely.^{15,47} In countries detecting cases of mpox, epidemiological and transmission patterns should be investigated wherever possible in order to tailor response activities.

At local and national level, countries should systematically document the number of suspected cases reported, the number of suspected cases which are tested, and the number of confirmed cases among those tested.

Indicators for monitoring the quality of mpox surveillance should be selected in accordance with the established objectives of surveillance in each context. These will likely include but not be limited to:

1. Timeliness of receipt of case reports at each administrative level.
2. Completeness of receipt of case reports at each administrative level.
3. Proportion of suspected outbreaks (alerts) investigated.
4. Proportion of suspected cases with laboratory testing performed.
5. Time from specimen collection to receipt of specimens in the lab.
6. Time from receipt of specimens in the laboratory to provision of results to appropriate authorities.
7. Proportion of confirmed and probable cases with complete demographic information
8. Proportion of confirmed and probable cases with complete clinical and risk factor information.

For each indicator selected, a target appropriate to the context should be set and compliance against this standard monitored. These targets will complement others on preparedness and outbreak response performance to meet policy goals and document progress towards elimination of human-to-human transmission of mpox.⁴⁸

Indications for mpox testing

Any individual meeting the definition for a suspected case should be offered PCR testing for mpox, where resources allow. In the absence of skin or mucosal lesions, PCR can be done on an oropharyngeal, anal or rectal swab. However, the interpretation of results from oropharyngeal, anal and rectal swabs requires caution: while a positive result is indicative of mpox, a negative result is not enough to exclude MPXV infection. PCR testing of blood is not recommended for surveillance and diagnosis, as MPXV viremia is likely to occur early in the course of infection and has a short duration, thus false negative test results are to be expected.⁴⁷

Due to the range of conditions that cause skin and mucosal rashes, it can be challenging to differentiate mpox solely based on the skin and mucosal clinical presentation, particularly in the early stages of rash, for cases with an atypical presentation, or for cases linked to sexual transmission which may not match classic descriptions of mpox rash. The decision to test should be based on clinical and epidemiological factors, linked to assessing the likelihood of infection. When clinical suspicion for mpox is high due to history, clinical presentation and/or atypical response to syndromic management of sexually transmitted infections, the

identification of an alternate pathogen that causes rash illness should not preclude testing for MPXV, as coinfections have been identified. Given the epidemiological characteristics observed in mpox outbreaks, criteria such as having had contact with a person with mpox, being a health worker, being a man who has sex with men, being a sex worker or otherwise reporting having multiple sex partners in the previous three weeks, can all be suggestive of the need to test for MPXV.

Where children or adolescents may be at risk, particularly but not exclusively in areas where mpox is endemic and continues to occur, the differential diagnosis for rash and fever illness should include mpox and investigation should be initiated. For countries with animal-to-human transmission, epidemiological criteria to test for MPXV include known or presumed contact with wild animals (dead or alive) and/or contact with sick animals in the 21 days before the onset of symptoms.

For study purposes, countries can retrospectively expand their testing to residuals of specimens collected from patients presenting for sexually transmitted infection (STI) screening and/or with symptoms suggestive of mpox.

Serological tests for OPXV antibodies can be appropriately used in an outbreak investigation or research setting but their results are to be interpreted with caution, since they cannot distinguish between immunity due to mpox or another orthopoxvirus-related infection or immunity generated by prior smallpox or mpox vaccination.

Reporting

WHO has updated and re-published the mpox Case Reporting Form (CRF)³ which constitutes the minimum data countries are requested to report to the respective WHO Regional Office, and includes the following information:

- Record ID
- Reporting Country
- Date of diagnosis
- Case classification
- Age, sex, gender, sexual behaviour
- Health worker
- Medical history (pregnancy, immunosuppression, HIV status)
- Clinical signs or symptoms
- Date of onset of first symptoms
- Hospital admission
- Intensive care unit (ICU) admission
- Recent travel history (in the 21 days before onset of illness)
- Contact with animals (in the 21 days before onset of illness)
- Mode of transmission
- Clade and genomic characterization (if available)
- Outcome status at time of reporting

Consideration should also be given by national mpox response programmes to collection of data on smallpox/mpox vaccination status as previously recommended.

The number of variables to report to WHO has been reduced in order to support the sustainability of the global surveillance system for the coming year, as outlined in the mpox standing recommendations.⁴⁶

The WHO standing recommendations for mpox⁴⁶ issued under the International Health Regulations (2005)⁴⁹ specify that WHO Member States should notify WHO of significant mpox-related events. A significant event is any event which might have broader implications for global public health, such as the identification of cases in previously non-affected countries, cases involving international travel, a rapid or large increase in cases in a country, shift in the demographics of affected populations, nosocomial outbreaks, new virus strains, antiviral-resistant virus strains, and any other event considered significant by Member States. This reporting will complement global surveillance by allowing rapid information sharing to inform public health response at local, national and global levels.

Case investigation

Close physical contact, including sexual contact, with a person who has or may have mpox is the most significant risk factor for MPXV infection. If mpox is suspected, the investigation should consist of:

- (i) clinical examination of the patient, using appropriate infection prevention and control (IPC) measures as reported in the specific guidance.¹⁵
- (ii) enquiring about possible sources of exposure and the presence of similar illnesses among the patient's contacts or in their community prior to diagnosis of mpox, to identify the source (backward contact tracing).
- (iii) Identifying all possible contacts from the time of exposure or, if unknown, from the beginning of the infectious period, until all lesions are healed, to put in place control measures and reduce onward transmission (forward contact tracing).
- (iv) safe collection and dispatch of specimens for mpox diagnostic testing and laboratory examination.⁴⁷

In addition to the minimum dataset (CRF), WHO has published the mpox Case investigation form (CIF)³ designed as a tool for Member States and researchers to conduct in-depth epidemiological investigation of suspected, probable and confirmed cases of mpox, as well as their contacts, either prospectively or retrospectively. The full form is meant for in-country use and the data are not required to be reported to WHO.

Exposure investigation should cover the period of 21 days prior to symptom onset. Laboratory confirmation of suspected cases is important but should not delay implementation of public health actions.

Cases found by retrospective active search may no longer have the clinical symptoms of mpox (i.e., they have recovered from acute illness) but may exhibit marks on the skin such as depigmentation or scarring or other sequelae. A contact identified retrospectively who exhibits signs or reports a history compatible with mpox and otherwise meets the case definition can be classified as a probable case. It is important to collect epidemiological information and where feasible identify other contacts for retrospectively identified cases in addition to active ones. Retrospective cases cannot be laboratory confirmed; however, in the context of special studies, serum from retrospectively identified cases can be collected and tested for OPXV IgM and/or IgG antibodies to assess exposure or immunity or aid in their classification as a probable case if necessary. Please refer to the WHO guidance on testing for MPXV for more details on serology testing.³²

Samples taken from persons with suspected mpox should be safely handled by trained staff working in suitably equipped laboratories. National and international regulations on transport of infectious substances should be strictly followed during sample packaging and transportation. Careful planning is required to consider national laboratory testing capacity. Clinical laboratories should be informed, in advance, of samples to be submitted from persons with suspected or confirmed mpox, so that they can minimise risk to laboratory

workers and, where appropriate, safely perform laboratory tests that are essential for clinical care. For more details, please refer to the WHO interim guidance on laboratory testing for MPXV.⁴⁷

Any patient with suspected mpox should be isolated during the presumed and known infectious periods, that is during the prodromal and rash stages of the illness, respectively.

Investigating exposure to an infected animal

The monkeypox virus was first identified in 1958 in non-human primates⁵⁰, and cases of human mpox have been described in the African context since 1970.⁵¹ In countries where MPXV is endemic in wildlife population, the proportion of human cases that can be attributed to zoonotic transmission is unknown but is likely to play an important role in mpox outbreaks.

Routes of infection include direct contact with an infected animal (bites, scratches, etc.), their body fluids, or potentially their faeces. Mpox might also be contracted through preparation or consumption of insufficiently processed products (e.g., meat) from wild animal. MPXV infection has been reported in a wide range of mammal species such as monkeys, squirrels, dormice, and pouched rats; most of these were sampled in captive animals. Neither the animal reservoir(s), which maintain the virus in nature, nor the range of potential intermediate animal hosts, which could play a role in animal-to-human transmission, are known. Therefore, it is critical to investigate cases for potential exposure to MPXV-infected animals, to conduct animal investigations to prevent further introductions of the virus into the human population, and to provide useful insights to reduce future spillover risks. Further investigations and studies are needed to understand the relative proportion (compared to human-to-human transmission) and risk factors for zoonotic transmission.

When exposure to an infected animal or animal products is suspected,, it is important to collect information during the case investigation on the animal species (preferably the exact species, for example by using species keys or collecting samples for DNA barcoding) with which the case came into contact, the time and place of the contact, the types and frequency of contact, information on whether the animal was caught alive or found dead, and whether the animal presented any signs of illness.³ Investigations regarding animal exposures are difficult because of the high frequency of animal-human contact in endemic areas, and because of several weeks passing between exposure and investigations (due to the incubation period and delays in identification and notification). For this reason, exposure investigations should be conducted as soon as possible after a case has been identified.

WHO has included a specific section on animal exposure on the mpox Case Investigation Form (CIF).³ The standardized data collection for animal exposure will allow animal and health authorities to more easily compile and compare this information in order to better quantify animal exposure risk. This is particularly important for countries in East, Central and West Africa, and will also be useful for any situation or context in which zoonotic transmission or exposure to infected animals is considered a possibility.

Contact tracing

Contact tracing is a key public health measure to control the spread of infectious pathogens such as MPXV. It allows for the interruption of chains of transmission and can also help people at a higher risk of developing severe disease to identify their exposure more quickly, so they can monitor their health status and seek medical care quickly if they become symptomatic. Cases should be interviewed as soon as possible to elicit the names and contact information of all potential contacts and identify events, gatherings, venues or places visited where contact with other people may have occurred. Contacts of cases should be notified within 24

hours of identification and advised to monitor their health status and seek medical care if they develop symptoms.

In the current context, as soon as a suspected case is identified, contact identification and contact tracing should be initiated, while further investigation of the source case is ongoing to determine if the case can be classified as probable or confirmed; in the event that a case is classified as discarded (i.e., no longer considered a suspected or probable case), contact tracing may be adapted to the new circumstances (e.g. for contact notification for another sexually transmitted infection) or stopped if no longer required.

Definition of a contact

A contact is defined as a person who has been exposed to a person with suspected (clinically compatible), probable or confirmed mpox during the infectious period and who has one or more of the following exposures:

- direct skin-to-skin, skin-to-mucosal or mouth-to-mucosal physical contact (such as touching, hugging, kissing, intimate oral or other sexual contact)
- contact with contaminated materials such as clothing or bedding, including material dislodged from bedding or surfaces during handling of laundry or cleaning of contaminated rooms
- prolonged face-to-face respiratory exposure in close proximity (inhalation of respiratory droplets and possibly short-range aerosols)
- respiratory (i.e., possible inhalation) or mucosal (e.g., eyes, nose, mouth) exposure to lesion material (e.g., scabs/crusts) from a person with mpox
- The above also apply for health workers potentially exposed in the absence of proper use of appropriate personal protective equipment (PPE).¹⁵

The infectious period for mpox is the period beginning with the onset of the index case's first symptoms), or if relevant up to two days before the onset, and ending when their skin lesions have crusted, the scabs have fallen off and a fresh layer of skin has formed underneath. In the absence of symptoms, a person with a positive PCR test for mpox, for example from an oropharyngeal or anal swab, should also be considered a confirmed case and infectious; contact-tracing initiated as outlined here.

Contact identification and notification

Cases can be prompted to identify contacts across several contexts, including household, workplace, school/nursery, sexual contacts, healthcare (including laboratory exposure), houses of worship, social gatherings, festivals, and any other recalled interactions. Attendance lists, passenger manifests, or other methods such as web or mobile applications can be used to identify contacts at events, gatherings, during travel or on conveyances such as cruise ships.

Any patient or other person exposed to contaminated materials from a patient/person with mpox in the health care or other congregate setting or venue should be considered a contact even in the absence of direct exposure to the case.

In settings where zoonotic transmission occurs, community contacts for point source exposure may include other persons hunting, selling, preparing or consuming the bushmeat meal at the same time.

Experience during the ongoing multi-country mpox outbreak, as well as previous outbreaks, shows that some cases may be reluctant or unable to provide contact information for all contacts, especially sexual contacts. To overcome this challenge, public health authorities should encourage cases to directly notify their contacts and provide them advice on how best to do this. Research in sexually transmitted infections has shown that

activities such as partner notification, i.e., voluntarily notifying a partner that they have been exposed to an infection, can yield good contact tracing results.⁵² In the context of mpox, cases should be offered adequate counselling on how to notify their contact, the recommendations for the contact's movement and activities, and referral information about health providers who can support the contact with information, or in case of symptoms, with health services. If possible, all information should also be provided in written form (e.g., leaflets, cards, links to webpages, or QR codes) to avoid misinterpretation.

Organizers of events or managers of venues or community settings from which mpox cases have been identified may also be involved in contact notification. Such venues where physical contact, including sex, occurs among participants may include saunas, bathhouses, nightclubs, cruise ships or personal service settings such as tattoo parlours. If a confirmed mpox case reports having attended an event or a venue where close physical contact took place during the infectious period, but is unable to identify all possible contacts, public health authorities should liaise with the event organizers to send a general notification to all participants about the potential risk of exposure. Also, in this case all relevant information about mpox, including referral to healthcare, should be provided together with the notification.

Once contacts have been identified, they should be informed of their exposure, their risk of developing infection, the symptoms of mpox, when symptoms may appear and testing options.

Contact monitoring

Contacts should be monitored, or should self-monitor, daily for the onset of signs or symptoms for a period of 21 days from the last contact with the probable or confirmed case or their contaminated materials (or up to two days before the onset of symptoms if feasible and appropriate). Signs and symptoms of concern include headache, fever, chills, sore throat, myalgia, malaise, fatigue, rash, and lymphadenopathy. Contacts should monitor their temperature twice daily irrespective of symptoms.

Options for monitoring by public health authorities are dependent on available resources. Contacts can be monitored passively, actively, or directly. In passive monitoring, identified contacts are provided with information on the signs and symptoms to monitor, permitted activities (see below), and how to contact public health authorities if signs or symptoms develop. Active monitoring is when public health officials are responsible for checking at least once a day to see if a person under monitoring has self-reported signs/symptoms. Direct monitoring is a variation of active monitoring that involves at least daily either physically visiting or visually examining via video for signs of illness or connecting by telephone to enquire about onset of any symptoms.

During the 21-day monitoring period, contacts should regularly practice hand hygiene and respiratory etiquette. As a precautionary measure, asymptomatic contacts should not donate blood, cells, tissue, organs, breast milk, or semen while they are under symptom surveillance. Contacts should also avoid physical contact with persons who are immunocompromised or pregnant. As a precautionary measure, contact with children should be minimized during the monitoring period, if possible, while keeping the overall health and wellbeing of children as the primary consideration, and avoided if any symptoms appear. Contact with animals should be avoided, including pets where feasible.

Asymptomatic contacts who adequately and regularly monitor their status can continue routine daily activities such as going to work and attending school (i.e., no quarantine is necessary). Although evidence on pre-symptomatic or asymptomatic transmission is still emerging and not conclusive, known contacts of confirmed or if not tested, clinically compatible, cases are advised to avoid sexual contact with others during

the 21-day monitoring period, irrespective of their symptoms. This is a precautionary measure to minimise the risk of onwards transmission from contacts.

Local health authorities may choose to advise for pre-school children identified as contacts to not attend day care, nursery or other group settings during the contact follow-up period.

A contact who develops prodromal symptoms or lymphadenopathy should be isolated and closely examined for signs of rash. In absence of skin or mucosal lesions, PCR can be done on an oropharyngeal, anal or rectal swab. However, the interpretation of results from oropharyngeal, anal or rectal swabs requires caution; while a positive result is indicative of mpox, a negative result is not enough to exclude infection. A contact with a positive PCR test from an oropharyngeal, anal or rectal swab is to be considered a confirmed case, while if it is negative the contact needs to actively monitor for signs of rash for the next five days. A contact who develops skin or mucosal lesions should be isolated and evaluated as a probable case, and a specimen from the lesions should be collected for laboratory analysis to test for mpox. If no rash develops, the contact can return to temperature monitoring for the remainder of the 21 days.

The following individuals should avoid undertaking any travel, including international travel, until they are determined to no longer constitute a public health risk for others: any individual with signs and symptoms compatible with MPXV infection; anyone being considered as a suspected, probable, or confirmed case of mpox by jurisdictional health authorities; anyone who has been identified as a contact of a mpox case and, therefore, is subject to health monitoring. Exemptions include any individual who needs to undertake travel to seek urgent medical care or flee from life-threatening situations, such as conflict or natural disasters; and contacts for whom pre-departure arrangements to ensure the continuity of health monitoring are agreed upon by sub-national health authorities concerned, or, in the case of international travel, by national health authorities. Cross-border workers who are identified as contacts of a mpox case can continue their routine daily activities provided that health monitoring is duly coordinated by the jurisdictional health authorities from both/all sides of the border.⁵³

Monitoring exposed health workers

Any health worker who has cared for a person with probable or confirmed mpox or worked with a relevant laboratory specimen should be alert to the development of symptoms that could suggest mpox, especially within the 21-day period after the last date of care, and particularly if there has been a known or suspected breach in IPC precautions. WHO recommends that health workers with an occupational exposure to an mpox case or MPXV should notify infection control, occupational health, and public health authorities to receive an assessment and management plan for the exposure and potential infection.¹⁵

Health workers^d who have occupational exposure to patients with mpox or possibly contaminated materials (such as by a needlestick or other percutaneous sharps injury, fomites or contact with a case while not wearing appropriate PPE) should follow national infection control guidance. Such contacts do not need to be excluded from work duty if asymptomatic, but should actively monitor for symptoms, which includes measurement of temperature twice daily for 21 days following the exposure; conversely, they should not

^d Health workers are all people engaged in work actions whose primary intent is to improve health. This includes health service providers, such as doctors, nurses, midwives, public health professionals, lab-, health- and medical and non-medical technicians, personal care workers, community health workers, healers and practitioners of traditional medicine. It also includes health management and support workers, such as cleaners, drivers, hospital administrators, district health managers and social workers, and other occupational groups in health-related activities as defined by the International Standard Classification of Occupations (ISCO-08).

work with vulnerable patients during this period. Prior to reporting for work each day, the health worker should be interviewed regarding evidence of any relevant signs or symptoms as above.

In order to avoid transmission in the health care or other congregate setting, it is also critically important to ensure that infection prevention and control measures be in place. All spaces occupied by a patient with mpox must be thoroughly cleaned before making the space available to other patients or residents, most particularly noting the importance of cleaning bedding and laundering sheets prior to reuse of the space.¹⁵ Where vaccines are available, post-exposure vaccination within four days of exposure (or up to 14 days in the absence of symptoms) is recommended for health workers, including laboratory personnel, who come in contact with a case or potentially infectious material without use of appropriate PPE. For more details on vaccines and immunization for mpox, please consult the specific guidance.⁵⁴

Travel-related contact tracing

Public health officials should work with transportation authorities, conveyance and points of entry operators, and other national health authorities to facilitate international contact tracing, when required, during travel or upon return, in order to assess potential risk of exposure and to identify contacts (passengers and others) who may have had exposure to a case while travelling. If a probable or confirmed case is reported in a long-distance travel conveyance (e.g., lasting more than six hours), travellers seated in the same row, two rows in front and two rows behind the sick traveller, as well as the cabin crew who served the case, should be contacted to assess the risk of exposure and monitoring requirements. Any passenger or crew team member who did not report physical contact with a symptomatic case and was not seated in the aforementioned rows should not be considered a mpox contact.

For themed events or gatherings such as cruises with many passengers on board, it may be difficult to identify contacts of a case identified on board, as many people may have been exposed. If a person with mpox reports having attended an event or a venue where close physical contact took place during the infectious period, but is unable to identify all possible contacts, public health authorities should liaise with the event organizers or cruise operators to send a general notification to all participants about the risk of possible exposure.

In specific settings such as travel by river boat with many passengers on board, there may be an additional risk of exposure to the monkeypox virus through sale, preparation and consumption of bushmeat. Wherever travel by boat represents a high risk of transmission, organizers or port authorities may consider administering a short health questionnaire and providing further information on mpox to passengers before they disembark. All relevant information about mpox, including referral to health care, should be provided together with the notification.

More specific evaluations for each scenario need to be assessed on a case-by-case basis by national and local health authorities.

Monitoring and evaluation of contact tracing quality

Indicators for monitoring the quality of mpox contact tracing include:

1. Proportion of probable and confirmed cases with identified contacts
2. Number of contacts reported per probable and confirmed case
3. Proportion of identified contacts with complete follow-up information
4. Proportion of cases coming from a contact tracing list.

For each indicator selected, a target appropriate to the context should be set and compliance against this standard monitored.

Definition of mpox death for surveillance purposes

A mpox death for surveillance purposes is defined as a death in a probable or confirmed mpox case unless the alternative cause of death is trauma. In the endemic setting where access to laboratory confirmation of mpox is limited, this definition includes deaths among persons with suspected (clinically compatible) mpox, which are to be considered suspected mpox deaths. The diagnosis for mpox can also be confirmed after the death has occurred if there is sufficient lesion material to perform PCR testing. There should be no period of complete recovery between the illness and death for the death to be recorded as a mpox death.

Most persons with mpox who died have had a co-existing health condition, and mpox may not fully explain the outcome for the case. Nevertheless, for surveillance purposes, it is important to count and report all cases that die with MPXV infection to improve understanding of the full spectrum of disease. Although some countries undertake detailed medical investigations to decide on the most likely cause of death and may not rule the case a 'mpox death', WHO reiterates the importance of reporting *all* deaths among mpox cases.

Wastewater surveillance for mpox

Wastewater surveillance, also known as environmental surveillance (ES), has been shown to assist in public health decision-making for a number of public health threats – most notably for polio, typhoid, COVID-19, illicit drugs and antimicrobial resistance.⁵⁵ ES provides cost-effective population-level data on trends that are useful when they reveal information not reflected in clinical data because individuals are asymptomatic and/or do not access testing and treatment services.⁵⁶ ES can provide early warning of emergence, re-emergence, or surges of disease and help detect hotspot areas for investigation. Additionally, information from ES can be integrated into risk communication as a reminder of ongoing risk in communities. Banking of samples allows retrospective analysis to be performed.⁵⁶

Monkeypox viral DNA has been detected in urine, faeces, saliva, skin and mucosal lesions as well as semen samples of confirmed mpox cases in different countries.^{57–59} Live (replication competent) MPXV has been isolated from skin and mucosal lesions, semen, genital and rectal swabs. The concentration and persistence of virus or viral DNA shedding from the different sites vary based on the duration of the infection, and although no clear description of these dynamics is currently available, studies show that shedding can last up to 16 days from symptoms onset.⁶⁰

The virus present in mucosal and skin lesions can be released into wastewater during teeth brushing, hand washing, showers or baths, and from urine and faeces via toilets. Detecting MPXV DNA or live virus in wastewater is one method to detect ongoing community transmission in a specific area.^{61,62}

In the year and a half prior to this edition of the surveillance guidance, several countries began monitoring MPXV DNA presence in wastewater⁶³ and results have been made available for multiple countries.^{46–53} Conversely, detection of replication-competent (live) MPXV in wastewater has not yet been reported. There is no known case to date of mpox contracted from contact with contaminated wastewater.

Theoretical research studies have estimated that wastewater surveillance could feasibly detect seven infections out of 100 000 people,⁶⁴ and observations in the United States of America highlighted that wastewater surveillance has a sensitivity of 32% for detecting a single mpox case in wastewater samples that represent thousands to millions of persons.⁶⁵ Sensitivity increases as the number of cases in the community increases. Positive and negative predictive values are high.⁶⁵ Further analysis of MPXV DNA data obtained from wastewater monitoring in relation to local epidemiological reports is needed to further validate the routine use of wastewater surveillance for mpox.⁶³ Additionally, where mpox vaccination is underway with vaccinia virus vaccines, selecting MPXV-specific PCR assays rather than generic OPXV assays would be essential.

WHO encourages countries to support research to clarify possible objectives, approaches, methods, and challenges for wastewater surveillance for mpox in different contexts.

Data collection and sharing

In order to facilitate data collection following the updated requested minimum dataset of the case reporting form (CRF), WHO has prepared a macro-enabled Microsoft Excel form (CRF data collection tool) that countries have received through IHR communication channels and which is available on the [webpage](#); however, any reporting format agreed with the respective Regional Office may be used.

WHO has also implemented the in-depth case investigation form (CIF) in the Go.Data platform⁶⁶ to facilitate local capture, analysis, and/or sharing of the relevant data. Countries that are using Go.Data can upload the mpox CIF and directly use it to collect case-based data for their mpox cases. The Go.Data mpox outbreak template and associated metadata description can be obtained upon request by emailing godata@who.int, and technical support for implementation is available from WHO.

Analysis of transmission chains and network visualization have been used in past outbreaks to identify clusters, understand patterns of exposure, and quantify viral transmission across different settings. In the context of the global mpox outbreak, understanding patterns of transmission has been critical to finding effective control measures and will allow for further characterization of modes of transmission including, in future, determining where multiple introductions (human or zoonotic) continue to occur.

Data collected in a harmonized way through the WHO case investigation form³ could also be collated across multiple countries in a collaborative effort, increasing the sample size and allowing for more robust analyses.

WHO will use case-based surveillance data only in aggregate and only for its own products, including external peer review publications, to better understand and explain the epidemiology of the mpox outbreak for the benefit of all countries. Data will not be shared with external third parties.

Methods

The recommendations in this guidance are based on the inputs of expert contributors (see below) and a literature search conducted by WHO, focusing on case definitions, transmission routes, contact tracing and epidemiology guidance previously developed for other mpox outbreaks. WHO also monitors established and emerging literature about animal infections, human reinfections and use of wastewater surveillance for mpox.

Plans for updating

WHO continues to monitor the situation closely for any changes that may affect this interim guidance. Should any important factors change, WHO will issue a further update. Otherwise, this interim guidance will expire one year after the date of publication.

Contributors

The initial version of this guidance was developed through the contributions of an expert group from the WHO secretariat in headquarters and regional offices, in consultation with the Strategic and Technical Advisory Group on Infectious Hazards (STAG-IH) and clinical and laboratory experts in Portugal, Spain, Sweden, the United Kingdom of Great Britain and Northern Ireland, and the United States of America. Additional contributions have been provided by colleagues from the United States Centers for Disease Control and Prevention (CDC) and the European Centre for Disease Prevention and Control (ECDC). Updates have been developed with contributions from experts working in the mpox Incident Management Team for

WHO headquarters and WHO regional offices, experts from the United States Centers for Disease Control and Prevention (CDC), the European Centre for Disease Prevention and Control (ECDC), and the United Kingdom; and continues to be informed by other interim guidance published and updated by WHO for this response. The new definitions of mpox reinfection presented here were likewise developed with external clinical, academic and research expert advisors. This guidance has also been informed through consultation of key stakeholders and assessment of surveillance systems in place in endemic settings. Persons consulted included key public health authorities in historically affected countries in East, Central and West Africa.

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